

On black magic: how epistemic modifiers emerge

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For Susanne Benesch

★ 22th July 1898, Vilnius

† Spring 1940, Ravensbrück

But your seed has prospered ...

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1 Preface

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2 Introduction

2.1 Aims

The major aim of this investigation is to account for the development of the epistemic modal verbs in German. As Abraham (2002, 24) and Mortelmans et al. (2009) have illustrated, German has a particularly rich system of modal verbs which involves a much more productive morphology than its English counterpart. As it has been shown by numerous investigations, such as Traugott (1989, 35), Öhlschläger (1989, 133), Sweetser (1990), Bybee et al. (1994, 195), Fritz (1997), Diewald (1999), Axel (2001, 45), they have diachronically emerged from circumstantial modal verbs. Yet, the details of this development are not entirely solved. Moreover, it has been revealed that such an endeavour is by far no trivial matter. In order to tackle this issue, a couple of related questions have to be solved beforehand.

The first question that raises concerns the nature of the so-called modal verbs: How can these verbs be characterised? Is there a way to delimit them from the remaining verbs? As it will be shown, the availability of an epistemic interpretation plays an essential role for the classification of modal verbs. Therefore, another issue has to be settled regarding the nature of epistemic modality: How does epistemic modality differ from circumstantial modality? Are there environments in which epistemic modal verbs are only tolerated and their circumstantial counterparts ungrammatical? Are there configurations in which epistemic modal verbs cannot occur but circumstantial modal verbs do? How can the distributional differences of epistemic modal verbs and circumstantial modal verbs be accounted for, if there are any? Once it is clear what the precise nature of epistemic modality is, it will be possible to envisage the major question: what circumstances triggered the development of epistemic modal verbs?

Summing up, the present investigation seeks to find the answers that match to these three central questions:

1. What is the nature of modal verbs?
2. What is the nature of epistemic modifiers?
3. What has triggered the development of epistemic modal verbs?

2.2 Method

The use of the modal verbs is one of the most extensively investigated phenomenon in German. Accordingly, the number of descriptions and analyses is vast. However, most of these accounts date from a period when no comprehensive electronic corpora were available. As a consequence, the large majority of the previous investigations are grounded on a very small set of empirical

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data. Frequently, this data has been obtained by introspection, a method which is not considered as reliable anymore in contemporary linguistics. Moreover, a lot of accounts employ similar data. Very often, the decisive examples on which these theories are based involve configurations which are somewhere in the twilight zone of grammaticality and, thus, difficult to evaluate. In approaches that are supported by introspective data, these configurations are judged as ungrammatical in the case of doubt. Yet, it often turns out that such configurations indeed exist if sufficiently large collections of texts are considered. Summing up, there are countless analyses of modal verbs in German that are most often based on introspective data rather than on authentic utterances. In most cases, the grammaticality judgements of the decisive examples is fairly contested. Accordingly, their theoretical status is not obvious.

In this spirit, the present investigation provides selected data taken from the German DeReKo corpus composed by the *Institut für Deutsche Sprache* (IDS). At the time of investigation, during the years 2010–2012, it encompassed about 2 billion word form tokens. A major contribution of this book is a systematic and thorough description of all potential modal verbs in German, which is well grounded on authentic empirical data. Furthermore, all of the case studies will deliver a critical summary of the previous discussion on the respective verbs and refer to the most important approaches that have been published in the last century. In this vein, the investigation presented here aims on the one hand to provide an evaluation of previous accounts and on the other hand to provide a sound empirical foundation for future analyses rather than contributing another analysis that lacks the support of authentic empirical data. This strategy may not appear very prestigious, however, the less spectacular way is often the more successful one.

As it has been noted above, this study has a diachronic focus. Diachronic studies are a comparison of at least two historically distinct stages of a language. In the present study, the first stage concerns the time before the so-called modal verbs had acquired the epistemic interpretations and the second stage the period after the modal verbs had developed their epistemic interpretations. Assuming that the latter one corresponds to the situation in present day German, one stage can already be clearly identified. As Fritz (1991, 29), Fritz (1997, 9, 95) and Müller (2001) illustrate, the number of uses of epistemic modal verbs attested in documents significantly increases for texts from the 16th century. In correspondence, it appears to be likely that the 16th century plays an important role for the development of epistemic modal verbs as well.

In order to provide reliable results, any diachronic investigation needs to collect as much knowledge of the respective stages to be contrasted. In the present case, there is a bias between the two stages to be investigated. As for present day German, native competence can still be accessed. In contrast, no speaker with native competence for Early New High German or Middle High German can be found anymore. For this reason, it appears to be most natural to gain as much knowledge as possible of the language stage that can still be accessed. In order to entirely understand the nature of a diachronic change, it is necessary to know at least one stage in every detail. Yet, there was no satisfactory description of the potential modal verbs in German that was based on authentic data at the time when this investigation was started. It appeared inevitable to establish such a description before a reliable diachronic comparison can be undertaken. A similar approach is advocated by Krämer (2005, 1).

Moreover, the diachronic developments of a linguistic item is often reflected by the synchronic situation of a language. Ambiguous words often involve two or more variants that have arisen in different periods and that co-exist next to each other in the synchronic state. As

Diewald (1999, 4) has pointed out, this exactly applies to the ambiguity of modal verbs in German. Most of the modal verbs are ambiguous between transitive, circumstantial and epistemic uses and all of them have developed in different periods: the transitive was the source for the circumstantial patterns and the circumstantial patterns in turn was the base for the epistemic uses. As the diachronic development of the epistemic modal verbs is partially reflected by the synchronic state, much can be learned by the investigation of data from present day German. Accordingly, the investigation outlined here focusses on synchronic data and takes into account data from earlier periods whenever it becomes inevitable. In addition to that, grammars from the 17th and 18th century have been investigated to deepen the knowledge about the nature of the potential modal verbs in earlier stages.

Finally, it turns out that the German term *Modalverb* is misleading and inconsistent. In order to discover the source of these inconsistencies, the history of the term will be meticulously investigated across grammars from the 17th century until the last decades.

2.3 Theoretical considerations

Any theory is a model of reality. A theoretic model is the more successful the more it resembles reality. In linguistic theories, a particular language L is generally considered as the set of all grammatical sentences that can theoretically be uttered in this language. The perfect theoretical description of that language L yields the set that contains all of the sentences that are judged as grammatical by the speakers of that language and none that are judged as ungrammatical. As easy as it sounds, the way to the perfect description quickly turns out to be barred by uncountable dangerous obstacles paved with insidious traps – sometimes fallacious notions will mislead the eager scholar.

In accordance with these prerequisites, the present investigation attempts to formulate a theory that captures as many uses of the so called modal verbs in German as possible. It aims at the coverage of all the uses of the different so-called modal verbs that have hitherto been discussed in the literature and that can be found in corpora.

In some of the newer accounts such as usage-based theories, the grammaticality of a linguistic structure is occasionally related to its frequency in corpora. As these theories sometimes conclude, patterns that do not occur frequently are grammatical to a lesser extent or not grammatical at all, therefore such uses should be neglected. Yet, frequency is not everything. Among rare linguistic structures, there are some that are regarded as deviant by the majority of the speakers of that language but there are also instances that are considered as fully grammatical. In the latter case, the low frequency is obviously due to another circumstance than a failure in the production of the utterance.

2.4 Results in a nutshell

Based on the three questions formulated in Section 2.1, the investigation of the corpus data has obtained the following results. As it will be shown in Chapter 4, the term *modal verb* in the traditional conception is not consistent. First of all, no characteristic could be found that separates the six traditional modal verbs, *können* ‘can’, *müssen* ‘must’, *wollen* ‘want’, *dürfen* ‘be

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allowed to', *sollen* 'shall' and *mögen* 'may' from the remaining verbs in German. Furthermore, each of these verbs has turned out to behave in a very idiosyncratic manner. These circumstances illustrate that the traditional six modal verbs do not form a natural class even if they exhibit some degree of undeniable kinship. The term modal verb in its traditional conception suggests that its class members are characterised by two properties: they should exhibit a morphological anomaly and that they should fulfil the same function in grammar. Yet, the set of the verbs with morphological anomalies and the set of the verbs that denote a necessity or possibility are not congruent. Accordingly, the most efficient solution is to refrain from the traditional term modal verb and to restrict the focus on the epistemic patterns. In doing so, the extension of the class becomes larger as verbs, which are not traditionally considered as modal verbs have to be taken into account, such as *werden* 'will, FUT.AUX' and *brauchen* 'need', a similar approach has already been suggested by Reis (2001, 308; 2005a).

As it turns out, the epistemic uses of the verbs considered here constitute a natural class of verbs in German in formal and functional respects: on the one hand, they select bare infinitive complements and they can encode epistemic modality. It is reasonable to assume that these two properties are in a close relation to each other. As it appears, the ideal epistemic modal verb in German selects bare infinitive complements and any verb that is about to acquire an epistemic interpretation has to lose its infinitive particle *zu* first. If the availability of an epistemic interpretation becomes the decisive property, the extension of the class has to be adapted. The class of epistemic modal verbs does encompass the ensuing items: *kann*, *könnte*, *muss*, *müsste*, *sollte*, *dürfte* 'it is likely that', *mag*, *braucht nicht* 'need not', *wird* 'will, FUT.AUX'. Due to the high degree of idiosyncrasies that these verbs involve in their non-epistemic patterns, an account becomes necessary that is capable to capture all these fine grained differences. It requires a lexicon that can differentiate between all these syntactic differences that the different potential modal verbs exhibit. For such an endeavour, a lexicalist account such as the Head-Driven Phrase Structure Grammar appears to be the most promising one.

As it has turned out that the availability of epistemic modality plays a crucial role for the classification of the verbs investigated here, it becomes necessary to understand its precise nature. As it will be shown, there are characteristic contrasts between epistemic modal verbs and their circumstantial counterparts. Chapter 5 focusses on the environments in which epistemic modal verbs are only grammatical, whereas their circumstantial cognates are ruled out. It will be pointed out that circumstantial modal verbs are event modifiers and, as a consequence, they are restricted to the selection of predicates that can be interpreted as events. In opposition, epistemic modal verbs can also embed predications between an identified subject referent and a predicate that denote states that cannot be altered or that refers to an event in the past. Accordingly, they have to be considered as propositional or speech act modifiers. Chapter 6 is dedicated to the contexts in which epistemic modal verbs are excluded but their circumstantial counterparts are fully grammatical. These non-canonical environments for epistemic modal verbs play an important role for their characterisation. In the present study, the twenty one most important environments will be thoroughly checked against corpus data. As it will be shown, more than half of them are fallacious as they are attested with epistemic modal verbs. There are only eight environments in which epistemic modal verbs could not be found: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisations, (iv) they are exempt from adverbial in-

finitives, finally, they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. This conclusion is very similar to the one drawn by Eide (2005, 9) for Norwegian. As the contexts (iv)–(viii) contribute some sort of circumstantial modal operator, the majority of the non-canonical environments can be accounted for in terms of intervention. As it appears, epistemic modal operators cannot occur in the scope of circumstantial modal operators. Furthermore, the corpus study has revealed that the assumption of a distinct ‘objective’ epistemic interpretation, as it has been suggested by Lyons (1977, 799), is misleading.

In Chapter 7, it will be shown that reportative uses of *wollen* and *sollen* differ substantially from epistemic modal verbs. In more detail, they are more flexible with respect to the contexts in which they may occur. In opposition to epistemic modal verbs, they are attested in nominalisations, adverbial infinitives, optatives and embedded under future auxiliary *werden*. Furthermore, it will be pointed out that they obtain a different interpretation whenever they are embedded under a past operator. Moreover, it turns out that the so-called evidential verbs *scheinen*, *drohen*, *versprechen* and *verheißen* belong to a different type of pattern.

In Chapter 8, it will be demonstrated as to how the behaviour of epistemic modal verbs and reportative modal verbs in non-canonical environments can be accounted for. The analysis is grounded on a couple of assumptions. The basic assumption is that epistemic operators contribute a variable for the deictic centre. In order to be interpreted, this variable needs to be locally bound by an appropriate attitude holder. In the canonical case for epistemic modal verbs, the variable is identified with the most salient referent of the speech act, which is the usually the speaker. Whereas with epistemic modal verbs the variable is only instantiated at the speech act level, the variable is anchored in a very local configuration with reportative modal verbs: it is bound to an argument of the modal verb itself. Besides from that, there are operators which fail to embed linguistic structures which contain unbound variables for the deictic centres, such as circumstantial modal operators. As a consequence, epistemic modal verbs cannot occur in the scope of such operators as their variable for the deictic centre is left open. In contrast, reportative modal verbs are acceptable in such environments. This explains why reportative modal verbs can occur embedded in configurations in the scope of certain modal operators such as adverbial infinitives or optatives whereas epistemic modal verbs are banned from such environments. According to this, epistemic modal verbs can be regarded as elements of the category verb as their incompatibility with the non-canonical environments results from the status of the variable which they introduce. Moreover, it will be demonstrated that approaches in the tradition of Cinque’s (1999) tradition which analyse modal verbs as functional categories face serious challenges to account for the data presented here. It appears that only lexicalist accounts such as HPSG are capable of providing an empirically well supported analysis.

Finally, the insights from the investigation of the epistemic modal verbs in the contemporary language use enable us to develop a scenario of how these modifiers came into existence. Chapter 9 is dedicated to the grammaticalisation of epistemic modal verbs. As it has been observed by Abraham (1991, 2001, 2005) and Leiss (2002), among the earliest uses of epistemic modal verbs, there are many that select stative or other imperfective predicates. This can be related to the findings of Chapter 5 in which it has been pointed out that circumstantial modal verbs are event modifiers, which are restricted to the modification of predications that involve (Davidsonian) event arguments. Following Maienborn (2003, 106), Kimean state predicates, such as the

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copula in German, do not contribute an event argument. Yet, already in Old and Middle High German instances of circumstantial modal verbs can be found that embed the copula *sein*. This situation is unexpected if circumstantial modal verbs are indeed restricted to the selection of predicates that involve an event argument. But as Maienborn (2003, 178, 193) argues, there are two pragmatic repair mechanisms that can render an event argument to a predicate that otherwise would lack such an argument: the temporariness effect and the agentivity effect. Likewise, Kratzer (1981, 61) argues that there are pragmatic mechanisms of coercion and accommodation that can adapt complements that do not fulfil the selectional restriction. As she remarks, this mechanism ‘*is black magic, but it works in many cases*’.

However, this mechanism is not always very easy to detect especially for L1 learners. As it appears, a generation of L1 learners was not able to decode this repair mechanism anymore. Rather, they have re-interpreted the utterance in a more economic way. Since epistemic modal verbs are not restricted to predicates that provide an event argument, they do not need the temporariness effect or the agentivity effect to apply. As circumstantial possibility verbs and epistemic possibility verbs sometimes obtain almost the same communicative effect, such a scenario seems to be very likely.

This results indicate that the grammaticalisation of epistemic modal verbs in essence a change from event modification to clausal modification and a process which leaves the original category of the grammaticalised element unaffected.

3 Abbreviations

The abbreviations employed in the glossed examples correspond to those found in the Leipzig Glossing Rules.¹ Additional tags used in the glossed examples are enlisted below:

CAUS	causative
COMP	comparative
COR	correlate
DIM	diminutive
INTN	intensifier
PART	particle
PPP(ge)	past participle with <i>ge</i> -prefix
PPP(ipp)	past participle with <i>infinitivus pro participio</i> -morphology
SUP	superlative
VPAN	VP anaphora

¹The Leipzig Glossing Rules can be found at the ensuing web site (last access 6th October 2012):
<http://www.eva.mpg.de/lingua/resources/glossing-rules.php>

4 Is there a class of modal verbs in German?

The term “modal verb” is probably one of the most current in the contemporary description of the German grammar and it is used as if it had always been there. All of the major grammars for German employ this expression, cf. Engel (1996, 463) Zifonun (1997, 1253), Eisenberg (2004, 90), Helbig and Buscha (2001, 114) and Eisenberg et al. (2005). But what exactly does it mean? How is it motivated? What is the benefit of using this term? The most common answer would be that this word refers to a group of six particular verbs which, according to many, constitute a ‘relatively closed system’ and are ‘part of a grammatical system of rules’, see Buscha et al. (1971, 7):

- (1) können, müssen, wollen, dürfen, sollen, mögen
can must want may shall like

And indeed, this corresponds exactly to what is taught in most schools in countries in which German is spoken as a native language and occasionally in institutions where it is taught as a second language.¹ As this answer is not very precise, it might raise further questions. What is the particularity of these six verbs? How do they differ from the remaining set of verbs? What makes them so special? Following the traditional view coined by Vernaleken (1861, 94), Bauer (1850, 102 §166), Curme (1922, 317), Helbig and Buscha (2001) argue that being of preterite present origin, they exhibit a particular morphology and that they select a bare infinitive and express a modality. Accordingly, they constitute a relatively closed group. Furthermore, Helbig and Buscha (2001, 115) point out that modal verbs in German resist passivisation and their past participle is always realised with infinitive morphology (IPP-effect, *Ersatzinfinitiv*). In a similar vein, Griesbach and Schulz (1976, 34) highlight that modal verbs lack imperative morphology. Summing up, in these approaches, modal verbs are characterised by morphological anomalies (preterite present origin, lack of an imperative, lack of a passive, IPP-effect), by the selection of a bare infinitive and by their ability to express modality. Buscha et al. (1971) suggest a whole range of further criteria, but they are rather intuitive and do not resist a closer scrutiny. There are a couple of influential studies that are lead by these assumptions, in particular that there is a class of modal verbs consisting of these six verbal lexemes. Among others, Bech (1949, 1951), and Diewald (1999) tried to provide a comprehensive description for the class determined in (1).

In the next sections, these criteria will be carefully reviewed. None of them will prove to be reliable enough to justify a homogeneous class containing the six items *können*, *müssen*, *wollen*, *dürfen*, *sollen* and *mögen* as a separate class. Finally, I draw the conclusion that the term

¹As Eva Valcheva (pers. commun) reports, the very same concept of *modal verb* is taught in schools in Bulgaria as well.

4 Is there a class of modal verbs in German?

modal verb, as it is most often employed in research on German grammar, is inconsistent and misleading.

4.1 Traditional criteria

As discussed above, there is some supporting evidence in favour of the assumption that the six verbs in (1) constitute a separate class. What follows is a collection of the phenomena adduced by different proponents of the traditional perspective. This does not mean that all traditionalists agree about the exact number of modal verb characteristics. Curme (1922, 317), for instance, only briefly refers to the morphological anomaly of these verbs that is mainly due to their preterite present origin. Other authors as Helbig and Buscha (2001) and Griesbach and Schulz (1976) mention further morphological features and moreover syntactic peculiarities. It is not always the case that each author was aware of the explanatory power of other potential criteria. The most promising of these potential characteristics will be discussed in the upcoming sections.

4.1.1 Morphological criteria

In particular, there are two morphological anomalies that can be found among the six traditional modal verbs: an inflection pattern which is typical for preterite presents and the *infinitivus pro participio* (IPP-effect). Finally, the lack of an independent imperative form will be discussed. According to some authors, such as Redder (1984, 305), all of these three features are related to the preterite present origin of these verbs.

Preterite present origins

According to Helbig and Buscha (2001, 29), one of the essential properties of the six traditional modal verbs is their preterite present origin. As it has been pointed out by Grimm (1822, 851, 1053), preterite presents are preterite forms of strong verbs that were reinterpreted as independent verbs. Roughly speaking, the accomplishment of an event in the past has been reanalysed as resultative state in present. The case of *wissen* ('know') has been most intensively investigated, as it is illustrated in Table 4.1. According to Meid (1971, 18), its development originates from an early period of Indo-European. Rix (2001, 606) assumes an Indo-European root **ueid* 'see' with its corresponding preterite stems **uóida* 'I saw' and **uid-* 'We saw'. Already in the Indo-European period, the preterite stems developed an independent meaning. Whereas in the original sense they referred to a seeing event in the past, they refer to a knowing state in the present in its reinterpreted form. Birkmann (1987, 351) illustrates this evolution from Proto-Germanic up to Modern German:

- (2) New High German *weiß* < Old High German *weiz* < West Germanic **weit* < Proto Germanic **wait* < Indo-European **uóida* 'I know' ⇐ 'I saw'
- (3) New High German *wissen* Old High German *wizzum* < West Germanic **witum* < Proto Germanic **witum* < Indo-European **uid-* 'We know' ⇐ 'We saw'

	present	past	present	past	present
infinitive	rīt-an		(wīzz-an)		wizzan
1. pers. sg.	rīt-u	reit-∅	(wīzz-u)	(weiz-∅) ⇒	weiz-∅
2. pers. sg.	rīt-ist	reit-ist	(wīzz-ist)	(weist) ⇒	weist
3. pers. sg.	rīt-it	reit-∅	(wīzz-it)	(weiz-∅) ⇒	weiz-∅
1. pers. pl.	rīt-emēs	rit-umēs	(wīzz-emēs)	(wizz-umēs) ⇒	wizz-umēs
2. pers. pl.	rīt-et	rit-ut	(wīzz-et)	(wizz-ut) ⇒	wizz-ut
3. pers. pl.	rīt-ent	rit-un	(wīzz-ent)	(wizz-un) ⇒	wizz-un
meaning	‘ride’	‘rode’	‘see’	‘saw’	‘know’

Table 4.1: Preterite present origin of *wissen* — the Old High German paradigm

During this process the form *wissen* maintained its preterite morphology of a strong verb. This becomes visible as soon it is compared with a preterite form of a verb belonging to the same class of *ablaut*, as *reiten* (‘ride’) for instance. And indeed, following Birkmann (1987, 135) and Braune and Reiffenstein (2004), *wissen* inflected for present tense behaves exactly as *reiten* in its preterite use, as is illustrated for Old High German in Table 4.1. Even if Pokorny (1959, 1126) adduces a verb *wīzzan* ‘look out, observe’ for Old High German, this does not mean that the process of reinterpretation only took place in that period. Effectively, the emancipation of the new meaning of *wizzan* already took place in Indo European time. The reason why *wīzzan* is nevertheless included in Table 4.1 is only for the ease of illustration. It only demonstrates how the original stem **uej̥d* would have looked like in Old High German. In essence, these patterns remain the same for New High German.

There are three characteristics that are particular to preterite presents: (i) the 1. and the 3. person singular remain without suffix in present tense. A similar observation has been made by Claius (1578, 96) who has noticed that there are nine verbs that lack suffixes in the 1. and 3. person singular which makes them to appear monosyllabic: *können*, *mögen*, *woellen*, *sollen*, *wissen*, *taugen* ‘to be good for sth’, *thuerren* ‘dare’, *dürfen* and *müssen*. (ii) They involve a vowel alternation between the present tense indicative stems in singular and plural and (iii) finally, they exhibit a further vowel alternation between the stem of the present tense and the past tense. As for the six verbs listed above, it turns out that indeed almost all of them are of preterite present origin. As, among others, Braune and Reiffenstein (2004) illustrate, *können*, *müssen*, *dürfen*, *sollen* and *mögen* can be derived from preterite stems of other verbs. Based on the observations about the Gothic counterpart *viljan* ‘want’, Grimm (1822, 853) has illustrated that *wollen* originates in a subjunctive of the past form of a volitional verb. A similar approach for the development of German *wollen* has been elaborated by Braune (1886, 259). However, in the course of history it assimilated morphology according to the paradigm of preterite presents, as it has been illustrated by Braune and Reiffenstein (2004).

The different origin of *wollen* is partly reflected by its deviating inflectional pattern, it does not involve a vowel alternation between the preterite stem and the infinitive. Therefore criterion (iii) for preterite present is not met, as indicated in Figure 4.2. At closer inspection, however, it turns out that the genuine preterite present *sollen* fails even to fulfil two of the characteristics particular to preterite presents. It involves no vowel alternation at all, correspondingly, the criteria (ii) and

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	1. and 3. p. present tense without suffix	vowel change		past tense	
	1./3. p. sg.	1.-3. p. sg	1– 3. p. pl.	infinitive	past tense
<i>können</i>	<i>kann-∅</i>	<i>kann</i>	<i>können</i>	<i>können</i>	<i>konnte</i>
<i>müssen</i>	<i>muß-∅</i>	<i>muß</i>	<i>müssen</i>	<i>müssen</i>	<i>mußte</i>
<i>mögen</i>	<i>mag-∅</i>	<i>mag</i>	<i>mögen</i>	<i>mögen</i>	<i>mochte</i>
<i>dürfen</i>	<i>darf-∅</i>	<i>darf</i>	<i>dürfen</i>	<i>dürfen</i>	<i>durfte</i>
<i>wollen</i>	<i>will-∅</i>	<i>will</i>	<i>wollen</i>	<i>wollen</i>	<i>wollte</i>
<i>sollen</i>	<i>soll-∅</i>	<i>soll</i>	<i>sollen</i>	<i>sollen</i>	<i>sollte</i>
<i>wissen</i>	<i>weiß-∅</i>	<i>weiß</i>	<i>wissen</i>	<i>wissen</i>	<i>wußte</i>

Table 4.2: Modal verbs and preterite present morphology

(iii) are not met. In a similar fashion, *muozan* lacked the vowel alternation between the indicative forms in singular and plural in Old High German, violating criterion (ii), as has been illustrated by Birkmann (1987, 129).

Finally, the status of criterion (iii) is unclear as it does not uniquely apply to preterite present verbs but it can be found with many more verbs. In more detail, the vowel alternation between the infinitive and the past tense stem is a characteristic that affects most of the irregular verbs, as well. As illustrated by Eisenberg et al. (2005, 491–502), there are than 190 irregular verbs that display a vowel alternation between the present stem and the past stem.

As a consequence, preterite present morphology emerges as no suitable property to unify the traditional six modal verbs to a homogeneous class. A definition of the modal verb based upon the preterite present morphology faces a further challenge since it incorrectly excludes *wissen*, which is obviously the oldest among the preterite presents and has preserved all the relevant features, as opposed to *sollen*.

It is symptomatic of approaches that invoke the preterite present past of the six traditional modal verbs that they acknowledge at some later point that *wollen* has in fact different origin and only assimilated in the course of time, for instance Curme (1922, 317). Herein, German behaves differently to English, where the class of preterite presents coincided with a group of verbs with ‘modal’ meanings, as Lightfoot (1979, 102) has pointed out. All of the other preterite presents vanished. This in turn triggered a radical process of syntactic change with the result that all of the preterite presents were reanalysed as auxiliaries. Lightfoot (1979, 98) stresses that preterite presents in Old English *sculan*, *willan*, *magan*, *cunnan* and *motan* exhibited all those features that are typical for a canonical verb. In the 16th century, however, they suddenly lost these features and were reanalysed as functional elements. To sum up, preterite present morphology cannot be employed as class defining property to separate the six traditional modal verbs from the remaining verbal elements: *wollen* is no preterite present and there is a further preterite present, *wissen*, which is usually not considered as a modal verb.

The IPP-effect: the *Ersatzinfinitiv*

A further criterion that is invoked in traditional definitions is the *Ersatzinfinitiv* or *infinitivus pro participio* (IPP-effect), see Helbig and Buscha (2001, 115). Verbs such as *dürfen* will usually be realised with infinitive morphology whenever embedded by the perfect auxiliary *haben* ‘have’. As opposed to the canonical type of verb, the *ge*-participle is not available in this distribution for the six traditional modal verbs.² This holds at least in Standard German, some Western German dialects do not exhibit the IPP-effect and therefore employ the *ge*-participle in corresponding contexts.³

- (4) Das hättest du nicht sagen dürfen / *gedurft
 that had you NEG say-INF may-PPP(ipp) may-PPP(ge)
 ‘You shouldn’t have said that.’

The relation to the present preterite history of these verbs is obvious. Being former preterite tense forms of some other verbs, the traditional six modal verbs were lacking a full inflectional paradigm. Therefore, it became necessary to develop a past participle on their own. But as already explicitly pointed out by Kurrelmeyer (1910, 167), the IPP-effect is no genuine innovation of modal auxiliary verbs: the first of the traditional modal verbs attested with IPP-effect is *müezen* in the 15th century, the last one is *sollen* which is only attested from the 16th century onwards. Some other verbs exhibit the IPP-effect much earlier: *tun* ‘do’ (1259), *helfen* ‘help’ (1263), *hoeren* ‘hear’ (13th century), *heizen* ‘command’ (1277), *lazen* ‘let’ (13th century), *sehen* ‘see’ (14th century), *machen* (1475). In a similar vein, Hinterhölzl (2009, 202) argues that the IPP-effect originally emerged with *heißen*, *lâzen*, *tun* and *hoeren* and only spread to the preterit presents in the course of time. This is by and large further confirmed by Ebert et al. (1993, 413–414), who show that *müssen* occurred with IPP-effect already in the 13th century, whereas the remaining traditional modal verbs *wollen*, *mögen*, *können* have only acquired it in the course of the 15th century, or even much later, such as *sollen* and *dürfen*.

As already mentioned above, it seems plausible that preterite present verbs and other verbs with defective paradigm such as *wollen* seek to complete their morphological inventory. The

³The status of the IPP is fairly contested. There are scholars such as Hinterhölzl (2009, 198) that argue that it is a genuine infinitive, others argue that it is a hidden participle. A detailed discussion is provided in Hinterhölzl (2009, 197f.). As it fulfils a similar role as the common *ge*-participle, it will be glossed as: PPP(ipp). Yet, this should not be taken as statement whether the IPP is really substantially the same as a *ge*-participle.

³In some varieties, the acceptability of *ge*-participles increases when the bare infinitive appears separated from the modal verb:

- (i) Wollen hätte ich schon gedurft...
 want-INF had I though may-PPP(GE)
 It was okay for me to want it.
 DeReKo: M09/AUG.63846 Mannheimer Morgen, 15.08.2009.
- (ii) Wollen hätten wir schon mögen, aber trauen haben wir uns nicht gedurft.
 want-INF had we though like-PPP(ipp) but dare-INF had we us NEG may-PPP(ge)
 To want it was appealing, but we were not permitted to dare it.
 DeReKo: NUN08/JUL.00977 Nürnberger Nachrichten, 09.07.2008.

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remaining preterite presents that do not belong to the traditional six modal verbs are also attested with IPP-effect, at least in earlier stages of German. Kurrelmeyer (1910, 164) gives an example for *türren* ‘dare’ with an infinitive complement displaying the IPP-effect from the year 1375. Moreover, there are numerous occurrences of *wissen* with *zu*-infinitive from the 17th century that display a mental ability reading and exhibit the IPP-effect, as illustrated in (5)–(12). This has already been pointed out in the 17th century by Bödiker (1698, 109) (cf. Section 4.3 for more details), Grimm (1837, 168), Sanders (1908, 428), Ebert et al. (1993, 413) and Maché and Abraham (2011, 256). In contrast to the remaining preterite presents, *wissen* persistently selects an infinitive with *zu*.

- (5) der Arzt Asclepiades hat durch den beweglichen Wollaut der
the physician Asclepiades has by the moving euphony the-GEN
lieblich=zusammenklingenden Seiten/ die abweichende Vernunft abzuhalten
lovely.harmonic chords the deviating reason detain-INF
wissen/⁴
know-PPP(ipp)
‘The physician Asclepiades knew how to use the moving euphony of harmonic chords to prevent distraction of thought.’
- (6) liesz mein buechlin, so wirstu sehen, das der luegegeist nicht hat wissen
read my book so will.you see that the lye.spirit NEG has know-PPP(ipp)
zu antworten⁵
zu answer-INF
‘Read my book and you will see that the lying spirit was not able to answer’
- (7) Agricola: Ich hab nichts darinn wissen zuo meiden oder außzulasen.⁶
Agricola I have nothing there.in know-PPP(ipp) zu avoid-INF or zu.ignore-INF
‘Agricola: I could not have avoided or ignored any of them.’
- (8) Er hat sich wissen ò gewust in seine Gnade einzuschleichen⁷
he has ANA know-PPP(ipp) or(ita) know-PPP(ge) in his mery zu.-INF
‘He made himself endear to him)
- (9) Sie hat nicht wissen ò gewust zu hüten⁸
She has NEG know-PPP(ipp) or(ita) know-PPP(ge) zu watch-INF
‘She couldn’t watch (it)
- (10) er hat es nicht auszurichten wissen⁹
He has it NEG transmit.zu-INF know-PPP(ipp)
‘He could not transmit it’

⁴Schottelius, *Ausführliche Arbeit von der Teutschen HauptSprache* (1663), p. 67.

⁵Martin Luther 26, 613 W, [as cited in Grimm DWB]

⁶Johannes Cochläus, *Ein heimlich Gespraech von der Tragedia Johannis Hussen*, Actus tertii scena unica, (1538), B 3a.

⁷Matthias Kramer, *Das herrlich-Grosse Teutsch-Italiänische Dictionarium* (1702), p. 1368.

⁸Matthias Kramer, *Das herrlich-Grosse Teutsch-Italiänische Dictionarium*, (1702), p. 1368.

⁹As discussed in Grimm IV, 168.

- (11) Sie hätten damit nichts wissen anzufangen¹⁰
 they had with.it nothing know-PPP(ipp) start.zu-INF
 ‘They did not know what to do with it.’
- (12) Hat Rom sein siebenbergigt Haupt sonst nirgends hin zulegen wissen¹¹
 Has Rome its seven.hilled head apart nowhere PAR lay-INF know-PPP(ipp)
 ‘Rome did not have any other place for its head made of seven hills to lay.’

Interestingly, most of the occurrences of *wissen* collected here are in the scope of a negation. This is reminiscent of the negative polar behaviour of other modal verbs such as the raising pattern of *wollen*, emotive *mögen*, earlier uses of *dürfen* and *brauchen*, as it is illustrated in Section 4.2.3, 4.2.4, 4.2.7 and 4.2.9. Moreover, these examples involve a word order that contradicts the patterns typical to coherence/clause union (2-1 or 1-3-2). Only in the constructed example in (10) given by Grimm (1837, 168), the subcategorised infinitive complement immediately precedes *wissen*. As Grimm (1837, 168) notices, the IPP-effect with *wissen* can be frequently observed in the vernacular, nevertheless, he regards this use as false, since the IPP-effect is a property that is restricted to verbs that sub-categorise bare infinitive complements. Instead, he advises to employ the *ge*-participle *gewußt* in these distributions.

As demonstrated by Maché and Abraham (2011, 269), there are at least two properties that make verbs with non-finite complements susceptible to the IPP-effect: a defective paradigm as in the case of preterite presents and *wollen* and raising infinitives, such as the subject-to-object raising (AcI) verbs *lassen* ‘let’, *hören* ‘hear’, *sehen* ‘see’, *fühlen* ‘feel’ and the subject-to-subject raising verbs, *pflügen* ‘used to’ and *düncken* ‘seem’, both exhibiting the IPP-effect during the Early New High German period. A third relevant property is the selection of bare infinitive complements. Turning back to the modal verbs, it becomes clear as to why they are such prominent exponents of verbs with IPP-effect: they involve all of those properties. They exhibit raising patterns (as will be shown in more detail in Section 4.2), a defective paradigm and finally, they select bare infinitive complements. This explains why they are susceptible to this morphological anomaly to such a great extent.

At this point, it also becomes clear that the traditional six modal verbs did not grammaticalise as a block, rather, each verb had its own development and each development had its own pace. This in turn demonstrates that the extension of the group of verbs with auxiliary-like behaviour differed with respect to the particular period. As will be shown in Section 4.1.2, each of the traditional six modal verbs developed the ability to select bare infinitive complements at an individual point of time. If there were periods during which the traditional modal verbs did not constitute a homogeneous class, we might reassess the empirical evidences in order to find out whether there is a period at all in which these six verbs form such a class. Even if the six traditional modal verbs acquired the-IPP effect before they developed a *ge*-participle on their own, as Ebert et al. (1993, 414) could show, it turns out that from diachronic perspective the IPP-effect is nothing particular to the six traditional modal verbs.¹²

¹⁰Hebel, [as cited in Sanders (1908), p. 428].

¹¹Daniel Casper von Lohenstein, *Ibrahim Bassa*, (1653), [as cited in Schoetensack 1856, 298].

¹²Kurrelmeyer (1910, 165) discusses a somewhat controversial example from a charter from the year 1332, which is taken to be a *ge*-less past participle:

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Shifting to the synchronic view, the situation is no different. Apart from the six traditional modal verbs, there is at least one further verb that obligatorily exhibits the IPP-effect whenever embedded by the perfect auxiliary *haben*: the causative use of *lassen* ‘let’, as it has been pointed out by Schmid (2000, 328). Once more the *ge*-participle is not available, cf. (13). Therefore, beginning with Becker (1841, 219), *lassen* is sometimes counted among the traditional class of modal verbs.

- (13) Sie hat ihren Mann umbringen lassen / *gelassen
She has her husband kill-INF let-PPP(ipp) let-PPP(ge)
‘She let him be killed.’

Note that *lassen* also involves a permissive use (‘to tolerate’) and a relinquative (‘to leave something behind, let go’) one, as argued by Maché and Abraham (2011,). According to Aldenhoff (1962, 204), the causative and the permissive use always employ the IPP-effect, whereas the relinquative use optionally realises the *ge*-participle. Some speakers, however, also accept *ge*-participles of permissive *lassen*. Finally, the remarkable case of *brauchen* ‘need’ has to be mentioned, which, in contemporary standard German, always exhibits the IPP-effect, again the *ge*-participle is ungrammatical:

- (14) a. Aber Flavio Cotti hätte nicht zu kommen brauchen.¹³
But Flavio Cotti have-SBJV.PST NEG to come-INF need-PPP(ipp)
‘But it wouldn’t have been necessary for Flavio Cotti to come’
b. *Aber Flavio Cotti hätte nicht zu kommen gebraucht.

Being very close to the traditional modal *müssen* in semantic respect, *brauchen* seems to have also assimilated to its counterpart in morphological respect. This concerns above all the development of the IPP-morphology. It has already been observed by Grimm (1837, 168, 949) in the early 19th century that *brauchen* as occasionally exhibits the IPP-effect, as is shown in his own example (15).¹⁴

- (15) das hätte ich nicht zu tun brauchen (gebraucht)
that have-SBJV.PST I NEG to do-INF need-PPP(ipp) (need-PPP(ge))
‘I wouldn’t have had to do it.’

-
- (i) Swelhie frau niht gehorsam hat getan oder tun wolt
which.ever lady NEG obedience has do-PPP(ge) or do-INF may-PPP(?)
‘Whatever lady that refused to obey or wanted to do so.’

However, note that *wolt* could also be analysed as preterite 3. person singular form.

¹³COMSAS II: E98/JUN.15388 Zürcher Tagesanzeiger, 19.06. 1998.

¹⁴As it will be shown in Section 4.2.9 in more detail, in some regions, *brauchen* is even subject to further processes of assimilation. According to André Meinunger (pers. commun.), this morphological assimilation of *brauchen* towards the “modal” morphology is even more developed in the region around Wuppertal where speaker omit the *-t* suffix of the 3. person indicative singular, such as in the sentence *Er brauch-∅ nicht kommen* ‘He need-∅ not come’. Similar observations about *brauchen* have been already made by Wurzel (1984, 117 & 149), Birkmann (1987, 5) and Girth (2000, 115) and Beringer. In this respect *brauchen* is reminiscent of *need* in Modern English which lacks an *-s* suffix if it is used with an infinitive complement, as it has been described by Sweet (1891, 425).

Even if he acknowledges that this pattern is frequent in colloquial speech, Grimm is reluctant to consider it as fully grammatical. According to his view, the IPP-effect only occurs with bare infinitives, in contrast, *brauchen* sub-categorises for a *zu*-infinitive. For this reason, he alludes the correct alternative, the *ge*-participle in brackets. As Sanders (1908, 101) demonstrates, *brauchen* with an infinitive complement could instead be realised as a *ge*-participle up to the 19th:

- (16) er hätte nur die Regungen der eigenen Brust zu besingen
 he have-SBJV.PST only the emotions the-GEN own chest to sing
 gebraucht¹⁵
 need-PPP(ipp)
 ‘He only needed to sing about the emotions in his chest.’

In opposition to Grimm (1837), Sanders (1908, 101) judges *brauchen* with IPP-effect as grammatical, moreover, he argues that the infinitival particle *zu* can occasionally be dropped – which is remarkable since Sanders advances a rather normative perspective. The optionality of the *zu*-particle will be dealt with in Section 4.2.9.

Apart from causative *lassen* and *brauchen* with an infinitive, there is a large group of verbs that optionally permit the IPP-effect: following Schmid (2000, 330) this concerns in particular the AclI verbs (object-to-object raising, exceptional case marking) *sehen* ‘see’, *hören* ‘hear’, *fühlen* ‘feel’, moreover benefactive verbs such as *helfen* ‘help’, *lernen* ‘learn’ and *lehren* ‘teach’. Aldenhoff (1962) and Sanders (1908, 222) provide an extensive discussion on this issue.

In a less systematic way, Heyse (1822, 413) has already observed that the IPP occurs with a whole range of verbs *dürfen*, *heißen*, *helfen*, *hören*, *können*, *lassen*, *mögen*, *müssen*, *sollen*, *sehen*, *wollen*, *lehren* and *lernen*. Yet, Heyse (1822, 414) argues that this use is a grave violation of the logical principles (*‘grober Verstoß gegen die Logik’*). Accordingly, he suggests to better use the *ge*-participles of these verbs even if they take infinitive complements. Likewise, Schoetensack (1856, 298) has attested the IPP with a similar group of verbs: *hören*, *heißen*, *sehen*, *helfen*, *lassen*, *sollen*, *wollen*, *mögen*, *dürfen*, *müssen*, *wissen*, *können*, *fühlen*, *lehren* and *lernen*.

As demonstrated above, the IPP-effect is no property that is restricted to the traditional six modal verbs. Hence, it is not suitable as class defining property. For the sake of completeness, note that some grammarians indeed suggest that the IPP-effect is the essential criterion for auxiliary-hood, acknowledging that the extension of such a class does not exactly correspond to the six traditional modal verbs. The first one who discusses the IPP-effect is Ölinger (1574, 151). As he observes, the five verbs *woellen*, *sollen*, *doerffen*, *koennen* and *moegen* do not employ a *ge*-participle but an infinitive whenever embedded under a perfect tense auxiliary. Bödiker (1698, 109), in turn, argues that, because of their morphological anomaly, these five verbs together with *muessen* and *wissen* constitute a auxiliary-like class. In a similar vein, Sanders (1908, 222) argues that there are a lot of auxiliaries in German characterised by the IPP-effect encompassing the following items: *dürfen* ‘may’, *heißen* ‘command’, *helfen* ‘help’, *hören* ‘hear’, *können* ‘can’, *lassen* ‘let’, *lehren* ‘teach’, *lernen* ‘learn’, *machen* ‘make’, *mögen* ‘like’,

¹⁵Heine 2, 307, [as cited in Sanders (1908, 101)].

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müssen ‘must’, *sehen* ‘see’, *sollen* ‘shall’, *wollen* ‘want’ and occasionally *brauchen* ‘need’, *pflügen* ‘used to’, *suchen* ‘seek’, rare *empfinden* ‘feel’, *erblicken* ‘see’, *finden* ‘find’, *fühlen* ‘feel’, *schauen* ‘look’, *wissen* ‘know’, *zeigen* ‘show’.

In any case, the IPP-effect is no property that justifies a modal verb class in the traditional extension, neither from a synchronic nor from a diachronic perspective. Nevertheless, it proved to be a powerful criterion since there are only two more verbs apart from the traditional six modal verbs that obligatorily exhibit the IPP-effect: *lassen* and *brauchen*.

Imperative

Some authors such as Welke (1965, 14), Eisenberg (2004, 91) and Erb (2001, 97) argue that the six traditional modal verbs are further characterised by their inability to form imperatives. This perspective has already been developed by Claius (1578, 103) who claimed those verbs today referred to as preterite presents do not have an imperative except for *wissen*. In a similar fashion, Adelung (1801, 1608) argues that *wollen* does not form an imperative. It is not evident whether these observations indeed hold, at least two hundred years later the imperative of *wollen* is attested, as it is illustrated by the dialogue below taken from Goethe’s *Faust*:¹⁶

- (17) a. MARGARETE: [...] Du gehst nun fort? Oh Heinrich, könnt ich mit!
 you go PAR away oh Heinrich could I with
 b. FAUST: Du kannst! So **wolle** nur! Die Tür steht offen!
 you can so want-IMP just the door stands open

As already pointed out by Zifonun (1997, 1254), Hetland and Vater (2008, 99) and Vater (2010, 108) *wollen* has an imperative. Admittedly, this form is only available when used without an infinitive complement. It is important to keep in mind that even if the imperative usage of *wollen* is rather rare, it is much more acceptable than the imperative usage of other modals. This illustrates that there is a substantial difference between *wollen* on the one hand and the remaining traditional modal verbs on the other hand. In a similar vein, Hetland and Vater (2008, 97ff.) observe that each modal behaves different in morpho-syntactic manner. The markedness of imperative with the traditional six modal verbs might be also related to the defective nature of their paradigm. Likewise, the imperative of the last remaining preterite present apart from the modal verbs, *wissen*, is equally marked as the one of *wollen*, at least in Contemporary German. As already pointed out by Claius (1578, 103), the lack of imperative forms is a criterion that holds for most preterite presents including verbs that do not belong to the modal verb class in its traditional extension such as *thar* ‘dare’ and *taug* ‘suit’. Accordingly, this criterion does not justify treating the six traditional modal verbs as a homogeneous class either.

4.1.2 Syntactic criteria

The most important syntactic criterion that is invoked for the separation of the six traditional modal verbs from the remaining elements of the verbal category concerns the category of the complement.

¹⁶Johann Wolfgang von Goethe, *Faust - der Tragödie erster Teil*, V 4543, (1808).

The sub-categorisation of bare infinitive complements

As Welke (1965, 11 & 22) and Griesbach and Schulz (1960, 41 & 65) argue, an essential characteristic of the traditional six modal auxiliaries is the selection of bare infinitive complements. But as Welke (1965) already acknowledges, there are many more verbs in Contemporary German that sub-categorise bare infinitive complements. Following Maché and Abraham (2011, 236), at least ten different groups of predicates come into consideration. On the one hand, there are verbs that realise their complement as bare infinitive but never as *zu*-infinitive (18):¹⁷ the *do*-support auxiliary (18a)¹⁸, the future auxiliary (18b), the subjunctive auxiliary (18c), the traditional modal verbs (18d), subject-to-object raising (AcI) verbs (18e), verbs of motion (18f), verbs of caused motion (18g) and durative verbs (18h). On the other hand, there are verbs for which both types of realisation of the non-finite complements can be found: bare infinitives and *zu*-infinitives, see (19). Above all, this concerns benefactive verbs (19a) and (19b). The latter is a somewhat remarkable case, the realisation of the complement type is governed by the register: whereas *zu*-infinitive prevails in written standard language, the bare infinitive is almost restricted to spoken language.

- (18) a. *tun* ‘do’
 b. *wird* FUT.AUX
 c. *würde* SBJV.AUX
 d. *können, müssen, wollen, dürfen, sollen, mögen, (möchte)*
 e. *sehen* ‘see’, *hören* ‘hear’, *fühlen* ‘feel’, *finden* ‘find’, *spüren* ‘feel’, *lassen* ‘let’, *heißen* ‘command’, *machen* ‘make’, *haben* ‘have’
 f. *kommen* ‘come’, *gehen* ‘go’, *fahren* ‘ride’
 g. *schicken* ‘send’, *senden* ‘send’
 h. *bleiben* ‘stay’, *sein* ‘be’
- (19) a. *brauchen*
 b. *lernen, helfen, lehren*

This classification does not entirely correspond to Askedal (1989, 5). He suggests that *zu*-infinitives occurring with the verbs of motion in (18f) and verbs of caused motion (18g) have to be considered as their complement. Yet, he admits that the option containing the *zu*-infinitive in (20b) is only rarely used and is hardly found in verbal complex configurations (obligatorily coherent’ in the terms of Bech (1955)), in which the infinitive complement has to precede the finite verb as in (20a).

- (20) a. obwohl sie jede Woche zum Priester [beichten ging]
 though she every week to.the priest confess-INF went
 ‘Although she went to the priest to attend her confession each week.’

¹⁷Of course, some of the verbs below such as *sein* ‘be’ or *haben* can be found with *zu*-infinitive or other types of non-finite complements, but in these instances they will exhibit a different semantic interpretation.

¹⁸As it has been pointed out by Langer (2001, 63), the auxiliary *tun* in German has a whole range of functions: it can bear the past or subjunctive of the past morpheme and it is used to obtain particular configurations of information structure such as V-topicalisation.

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- b. obwohl sie jede Woche zum Priester [ging] [zu beichten]
though she every week to.the priest went zu confess-INF
'Although she went to the priest each week in order to attend her confession.'

Therefore, it does not seem plausible that the two types of infinitives have the same status. There are more aspects in disfavour of the hypothesis considered by Askedal (1989). Whereas the goal PP *zum Priester* 'to the priest' can be omitted in the first example without any ado. In contrast, the omission of the goal PP is subject to many more restrictions in the second example, indicating that the bare infinitive may only function as a goal argument. Moreover, the first pattern only entails the realisation of the event expressed by the infinitive in the examples above. Whereas the bare infinitive typically encodes the goal of the movement, the *zu*-infinitive rather indicates its purpose. Accordingly, the latter could easily be identified as reduced forms of adverbial *um-zu*-infinitives, which express the purpose of why the event provided by the main clause has been realised, as discussed by Eisenberg (1992; 2004, 351).

This illustrates once again that bare infinitive complements are found with a considerable number of verbs in Contemporary German. However, focussing on verbs with which the infinitival subject is co-referent with the matrix subject, Welke (1965, 11 & 22) argues that most verbs of this class are restricted to a small group of types of infinitives. In particular, he mentions the verbs of motion such as *kommen* and *gehen* and the durative verb *bleiben*. The only group of verbs that does not exhibit selectional restrictions with respect to the infinitive of this type encompasses the six traditional modal verbs. Further, there are two more verbs that behave accordingly. But Welke (1965, 11) explicitly excludes both of them from his definition: the auxiliary *tun* for not belonging to the standard variety and *werden* for the lack of past forms. As he acknowledges himself, his approach is somewhat arbitrary. Note that Welke's observation above is not quite correct, even the six traditional modal verbs fail to embed certain types of stative predicates (individual level predicates) in their non-epistemic variant, as will be shown in more detail in Section 5.2. Moreover, Engel (1996, 476) argues that *tun*, *bleiben* do not belong to the class of modal verbs since they use *-t* in third person singular, and as opposed to modals they never embed an infinitive perfect (**Er tut geschlafen haben* 'He does have slept').

As it turns out, the sub-categorisation of bare infinitive complements is not a property that is unique to the six traditional modal verbs. As a consequence, it cannot serve to justify syntactic homogeneous modal verb class in the traditional extension. Nevertheless, it proves to be a powerful criterion that almost manages to separate the six traditional modals from the remaining verbs in German. This will be illustrated in Section 4.1.4.

Assuming that the selection of a bare infinitive complement is the main characteristic for modal auxiliary-hood, the situation is once again different in earlier stages in German. As pointed out by Demske (2001, 76), most verbs that take non-finite complements in Old High German are not restricted to a particular type of infinitive. Without that the semantic interpretation is affected, they may either realise their complement as bare infinitives or as *zu*-infinitives. As Demske (2001, 74) stresses, a small group of verbs is only attested with bare infinitive complements and never with *zu*-infinitives: the preterite presents *kunnan* 'be mentally able to', *durfan* 'need', *scolan* 'shall', *mugan* 'can', *muoz* 'to have space', *gitar* 'dare' and the verb *wellen*, the perception verbs *hôren* 'hear' and *sehan* 'see', causative verbs *lâzan* 'let', *heizan* 'command' and *gituon* 'do, make somebody do something' and finally the raising verbs *scînan* 'seem' and

thunken ‘seem’.¹⁹

Birkmann (1987) gives a different perspective on the situation in Old High German. In contrast to Demske (2001), his study is restricted to preterite present verbs. According to his investigation of the *Isidor* (late 9th century) and a couple of smaller texts, *skulan*, **muozan*, *eigan* ‘have’, *magan*, *kunnan* can be considered as auxiliaries since they occur selecting a bare infinitive complement; *kunnan* is additionally attested as a main verb. In contrast, Birkmann (1987, 161) argues that *wizzan* and *thurfan* lack a use as an auxiliary and only occur as main verbs. Since Demske (2001) does not give precise examples for most of the preterite presents she discusses, it is not entirely clear how to cope with the minor contradictions between her observations and the ones made by Birkmann (1987). In any case, Birkmann (1987, 144) demonstrates that *kunnan* is not frequent at all until *Notker* in the early 11th century, the situation for *thurfan* is similar.

Diewald (1999, 297) only considers *sculan*, *mugan* and *wellen* as sufficiently grammaticalised in Old High German. Accordingly, she argues that these are the only modal verbs in that particular period. She explicitly excludes *thurfan* and *kunnan* since she has only found occurrences with nominal complements in her investigation but never with an infinitive. Moreover, Diewald (1999, 299) does not regard *muozan* as a modal verb for not exhibiting a “modal semantic” – even though it is attested with an infinitival complement. As she argues, *muozan* at that time is to be paraphrased as ‘to have space to do something’. Her approach, however, is not uncontroversial. First of all, it is not clear as to why Diewald (1999, 299) treats *kunnan* in Old High German as a mere main verb as she explicitly refers to Birkmann (1987), who demonstrates that *kunnan* also occurs with an infinitive in that very period. Moreover, her notion of “modal semantic” is rather intuitive and not compelling. In any case, Birkmann (1987, 144) and Diewald (1999, 299) agree that *können* and *dürfen* with an infinitive complement are rare until the end of the Middle High German period.

As it turns out, even from a diachronic perspective, the selection of bare infinitives is not a feature that distinguishes the six traditional modal verbs from the remaining verbs. Rather, some members of the traditional group such as *thurfan* and *kunnan* are hardly attested with an infinitive for the Old High German period. Moreover, Birkmann (1987, 144) and Demske (2001, 74) demonstrate that there are also additional verbs in that period that obligatorily select bare infinitives such as the preterite presents *eigan* ‘have to’, *gitar* ‘dare’, subject-to-subject raising verbs and subject-to-object raising verbs.

As in Contemporary German, the number of verbs that are sub-categorised for bare infinitives is fairly restricted in Old High German. The two stages differ a lot with respect to the particular verbs that belong to this pattern. But in none of the periods investigated so far, the group of verbs that select bare infinitives corresponds exactly to the traditional six modal verbs. Moreover, it turns out that each of the traditional modals acquired the ability to select bare infinitives at a different moment in history. As already shown in Section 4.1.1 each verb has its own development, each development its own pace. Correspondingly, there is no logical necessity that the class of modal verbs in German needs to encompass those six members that it encompasses. Fairly the opposite, there is much evidence that there might never have been a discrete class of modal

¹⁹As Birkmann (1987, 155) demonstrates, not the entire paradigm of the verb *muozan* is attested in Old High German. For this reason, the finite form only is adduced here.

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verbs but a loose compound that is in constant change. In a similar spirit, Wurzel (1984, 149) argues that, from the outset, there were two different classes: preterite presents and verbs that select bare infinitives with modal meanings. Crucially, those classes partially overlapped. Over the course of history, the two classes increasingly became congruent: the non-modal preterite presents lost their anomaly and the non-preterite presents with modal meanings such as *wollen* and *brauchen* assimilated to the preterite present morphology.

Summing up, the ability to select bare infinitive complements is not restricted to the six traditional modal verbs; neither in synchronic nor in diachronic respect. In Contemporary German, at least two verbs behave in comparable manner with respect to sub-categorisation: in particular, *werden* and *brauchen* in spoken language. Since this property is restricted to a small group of verbs only apart from the six modal verbs, it might be nevertheless suitable as class defining property. In this case, however, it would be necessary to reassess the extension of the class, as will be discussed in Section 4.1.4.

Subject-to-subject raising

Recently, another syntactic property has attracted much attention in the discussion about the characteristics of modal verbs in German. Öhlschläger (1989) and Wurmbrand (1999, 2001) argue that modal verbs in German are thoroughly subject-to-subject raising verbs – with the exception of *wollen* and the ability interpretation of *können* (and *möchte* which is analysed by both authors as an independent lexical item). These are verbs that lack a subject argument on their own and raise their subject from the embedded infinitive. Wurmbrand (2001, 187) subsumes all modal verbs with raising patterns under a proper syntactic category Mod^0 . In their epistemic interpretation, they are generated as a higher category in Aux^0 . However, there are subject-to-subject raising verbs apart from the six traditional modal verbs such as *scheinen* ‘seem’, *drohen* ‘threat’, *versprechen* ‘promise’, and *pflügen* ‘be wont to’. Wurmbrand (2001, 205) argues that all of them can be analysed as epistemic modal verbs. As will be shown in Section 4.2, these four raising verbs differ from epistemic modal verbs in crucial respects and therefore need to be treated separately.

In a recent study, Gergel and Hartmann (2009, 327) suggest in a radical manner that even the apparent control verb *wollen* needs to be considered as a raising verb. Since their Generalized Raising Hypothesis is based upon some non-trivial and theory immanent assumptions such as raising into theta positions, the discussion will be suspended here and resumed at a later point. Crucially, such a notion of modal verbs that is based on raising will not obtain a class extension corresponding to the six traditional items.

4.1.3 Semantic criteria

Finally, and most notably, most modal verb definitions also involve a semantic dimension. This is not surprising since the term *modal* already refers to a semantic phenomenon. But as this definition does not concern the material form of a sign but its immaterial function, there is not so much consensus on what the essential semantic criterion is for modal verbs. In the upcoming sections, the most plausible criteria will be briefly reviewed.

Modality

Like many others, Helbig and Buscha (2001, 44) assume that the traditional six modal verbs are characterised in that they express a modality. In their own words, a modality can be realised as an ability, a possibility, a necessity, a wish or the attitude of the speaker. Even if these notions intuitively share some common properties, it is not a trivial matter to identify them. All these expressions allow to locate the event or state denoted by the verb in some idealised world that is distinct from our world. Therefore, a modalised event need not be realised in the actual real world. Portner (2009, 1) suggests a similar definition: ‘*Modality is the linguistic phenomenon whereby grammar allows one to say things about, or on the basis of, situations which need not be real*’. But as already pointed out by Welke (1965, 19), such an attempt of a semantic definition that is based upon the expression of a modality fails, even if one only considers the five types of modality enlisted by Helbig and Buscha (2001). Many more verbs can be found that express one of these modalities, notably *brauchen* ‘need’, *vermögen* ‘be able to’, *haben + zu*-infinitive ‘have to’, *sein + zu*-infinitive ‘is to’.

Moreover, the concept of modality entertained by Helbig and Buscha (2001) is not consequent. As shown by Palmer (1986, 2), the notion of modality is rather vague and leaves open a number of possible definitions. First of all it, needs to be distinguished from the notion of mood. Whereas the term mood traditionally refers to an inflectional category, modality is typically marked by (modal) verbs, by particles and clitics, as it is argued by Palmer (1986, 22). As Lyons (1977, 452) suggests, modality concerns the ‘opinion and the attitude’ of the speaker. In any case, modality covers much more phenomena than those taken into consideration by Helbig and Buscha (2001). A more consequent theory of modality would also have to consider verbal concepts as “try to”, “plan to”, “intend to”, “be inclined to”, “contemplate doing sth.”, “dare to” and many more. A corresponding concept of modality would concern an even larger number of verbs. A more elaborate but still rather extensional definition of modality is proposed by Portner (2009, 4) according to which several subtypes have to be assumed that in turn involve a broad range of additional items to be considered:

1. sentential modality: modal auxiliaries, modal adverbs, generics, habituais, individual level predicates, tense and aspect, conditionals, covert modality
2. sub-sentential modality: modal adjectives, propositional attitude verbs, verbal mood, infinitives, dependant modals, negative polarity items
3. discourse modality: evidentiality, clause types, performativity of sentential modals, modality in discourse semantics

Finally, the major use of one of the six traditional modal verbs in Contemporary German is not captured by Helbig and Buscha’s conception: *mögen* in its prevailing use denotes affection.

No matter what concept of modality one adopts, it would never constitute a homogeneous class that only comprises the six traditional modal verbs. Numerous approaches assume that the six traditional modal verbs differ from all the remaining verbs in that they and only they express modality. The underlying concept of modality that these approaches rely on is an arbitrary enumeration of subtypes of modality. Accordingly, their concept of modality is not consequent.

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This holds even for the most systematic attempt to establish a unified semantic analysis for the six traditional modal verbs undertaken by Bech (1949, 38). Being the first one who attributed the term *Modalverb* to the six verbs *können*, *müssen*, *wollen*, *dürfen*, *sollen* and *mögen*, he tries to collect all the possible readings they occur with. In a second step he groups them into three subclasses: volitional (*wollen*, *sollen*, *dürfen*), emotives (*mögen*) and causal modals (*können*, *müssen*). They are further specified by means of two oppositions. The first one divides active modals (such as *müssen*) from passive ones (such as *können*). This roughly corresponds to the partition necessity versus possibility modals, as undertaken by Kratzer (1978, 1981). The second one determines whether the source of volition (or emotion) is located within the grammatical subject or subject external. Bech's approach is inductive. He assumes a class of modal verbs consisting of six items. He then tries to extract all those semantic properties they have in common. As illustrated above, the outcome is somehow biased. However, it remains unclear as to why Bech (1949) chose exactly these six verbs. It should not be surprising since Bech's choice was arbitrary. As already indicated by Welke (1965, 19), a definition of a class of modal verbs with the traditional extension based on semantic grounds fails.

It deserves closer attention that authors often presuppose some concept of modal meaning without giving a clear definition, such as Fritz (1997, 13) or Diewald (1999, 299). Therefore, it is not surprising that such a vaguely defined concept causes much confusion. Johnen (2003, 11) reports that based on a similar semantic definition about 230 different verbs are considered as modal verbs in Portuguese, whereas two of them only involve auxiliary-like properties.

Apart from the work by Kratzer (1978, 1981), there is hardly any other attempt that tries to make more explicit what makes modal verbs 'modal'. Following the tradition of modal logic, she adopts a possible world semantic. According to her view, modality can be described as quantification over possible worlds, whereas necessity is universal quantification (\forall) and possibility is existential quantification (\exists). Since her approach implies a much broader concept of modality that applies to many more items than the traditional six modal verbs, she does not conform to the class of modal verbs in its traditional extension.

The expression of the possibility or necessity of the embedded predicate denotation

Becker (1836, 176 §91–§93; 1841, 219) is one of the first grammarians who investigates auxiliary-like verbs in German that exhibit the IPP from a principled perspective. As he observes, verbs like *können*, *müssen*, *wollen*, *dürfen*, *sollen*, *mögen* but also *lassen* have lost their lexical meaning and only denote an abstract semantic relation:²⁰

aber sie drücken in ihrer jetzigen Bedeutung nicht mehr den Begriff eines Prädikates aus, sondern bezeichnen nur Beziehungsverhältnisse, nämlich die Möglichkeit und Nothwendigkeit der prädicirten Thätigkeit, die wir oben als Modusverhältnisse des Prädikates bezeichnet haben (§. 59) z.B. „Er kann tanzen“ „Er muß husten“; sie werden daher Hilfsverben des Modus genannt.

²⁰“[...] but, in their contemporary usage, they express a different meaning than that of the typical predicate, and rather they refer to just a relation as exemplified by the possibility or the necessity of the embedded predicate

It deserves closer attention as to which extent Becker's (1836, 1841) approach anticipates the spirit of modern modal logic analyses, such as the one elaborated by Kratzer (1978, 1981). The basic concepts are necessity and possibility. Much like Kratzer's modal base, Becker (1841, 221) suggests three types of specifications. Accordingly, necessity or possibility can be specified as real, moral or logical, whereas the last type corresponds to epistemic modality. Becker (1841) is one of the first grammarians who observes this type of modality.

Becker (1841) is not only the first one who attempts to give a general semantic description of these seven items that is based on the concept of necessity and possibility, but also the first who adopts the term *Modus* 'mood' to denominate these seven auxiliary-like verbs. It is fairly likely that Becker (1841) is even the origin of the contemporary concept of the modal verb class. It is only a small step from his original term *Huelfsverben des Modus* 'auxiliaries of mood' to *Modalverb*, as it is used by Bech (1949).

Even if Becker (1841) is on the right track some amendments still have to be made. He proposes a very clear definition of modality in terms of necessity and possibility yet it remains mysterious as to how volitional *wollen* and emotive *mögen* fits into this picture. Moreover, his definition also applies to a whole range of other verbs.

The availability of an epistemic interpretation

The most viable semantic criterion that can be invoked to justify the establishment of an independent class of modal verbs is the availability of an epistemic interpretation. It took a fairly long time until the peculiarity of these readings was acknowledged. Probably, the first one who considers it as a general property of modal verbs is Becker (1841, 221), who briefly discusses the so-called logical possibility and necessity readings for *kann*, *dürfte*, *muß*, *will*, *soll* and *mag*.

- (21) Er kann (dürfte, muß, soll) schon angekommen sein.
 he can might must shall already arrived-PPP be-INF
 'He could/might/must/is said to have already arrived'
- (22) Man will ihn gesehen haben.
 one wants him see-PPP have-INF
 'Somebody claims to have seen him'

Opposed to a moral or real possibility, *kann* in (21) denotes a logic possibility. This latter type expresses that, in view of what he knows, the speaker considers it possible that the propositional content of the modified clause holds. As Becker (1836, 180) already argues, the logical modal verbs differ with respect to subtleties in their interpretation: *kann* refers to possibility, *dürfte* to a probability, *mögen* has always a concessive resonance, *muss* refers to a logical necessity evaluated by the speaker, *wollen* expresses a logical necessity assessed by the subject referent and *sollen* expresses a logical necessity evaluated by another referent. For a couple of decades, epistemic readings did not attract too much attention. At best they are mentioned but their particular status remains veiled. As one among few, Curme (1922, 319) enumerates the epistemic interpretation for each of the six traditional modal verbs but he does not pay any further attention

denotation that was called mood of the predicate (§. 59), e.g. "He can dance", "He coughs [must cough]"; they are called auxiliaries of mood." [translation J.M.]

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to them, as Bech (1949) does. Most grammars, such as Vernaleken (1861), however, go as far as to ignore the epistemic interpretation completely.

Only in the early sixties, Griesbach and Schulz (1960, 65) acknowledge that the availability of an epistemic reading is an essential characteristic of the six traditional modal verbs. They are the first who systematically describe this type of modality for modal verbs in German. According to their view, modal verbs are characterised by the availability of two different interpretations: an objective (non-epistemic, root) one and a subjective (epistemic) one. Their position has frequently been adopted, cf. Öhlschläger (1989, 132), Engel (1996, 463), Diewald (1999, 1) and Reis (2001, 287). In more recent research this property is referred to as poly-functionality. In a less explicit way, Erb (2001, 74) also makes use of this concept.

As Westmoreland (1998, 12) and Ziegeler (2006, 90) point out, epistemic modifiers are subject to a particular condition. Since they label the modified proposition as mere assumption of the speaker, it follows that the epistemically modified proposition is not part of the speaker's knowledge.

Accordingly, whenever a speaker utters an epistemically modified proposition *epistemic* (p) such as the examples in (21), he signals to the hearer that p is not part of his knowledge. It would cause quite some confusion if the speaker would resume the discourse saying *...since I know that p is the case*. Canonically, the speaker would not know that p is false either. Likewise, he could not continue uttering *...although I know that p is not the case*, at least if he uses an epistemic modal verb which is inflected for the indicative. Similar observations have been made by Erb (2001, 161), Krämer (2005, 60, 133), Fintel and Gillies (2010, 353), Kratzer (2011) and Martin (2011, Sec. 3.1), a detailed discussion is given in Section 8. To a lesser extent, a similar position is defended by Papafragou (2006, 1693). In the remainder of this study, it will be demonstrated that the relevant referent does not always have to be the speaker such as in embedded clauses or in information seeking questions. Accordingly, this condition will be formulated with respect to a more abstract expression. In his *Lectures on Deixis* in the early seventies, Charles Fillmore has introduced the concept *deictic centre* (in the reprinted version: Fillmore (1997, 98)), which has subsequently been elaborated in more detail by Levinson (1983, 64). The deictic centre is a referent that is identical to the speaker in the most prototypical context but it can be instantiated by a referent other than the speaker of the actual utterance. A similar concept has already been suggested by Bühler (1934, 102). According to his terminology, this referent is called *Origio*, and as Abraham (2011, xxxv) points out it can also be used to describe epistemic modality.

As it will be shown in the Chapter 6, it is much more appropriate to formulate the condition for epistemic operators with respect to deictic centres rather than with respect to the actual speaker. For the sake of simplicity, this condition will be referred to as '*Condition on Deictic Centres* (CoDeC)' here:

(23) **Condition on Deictic Centres (CoDeC)**

The use of an epistemic operator indicates that the embedded proposition is not part of the deictic centre's knowledge.

Indeed, epistemicity turns out to be a property that does not apply to a lot of verbs in German. Apart from the traditional six modal verbs, only five more verbs come into consideration: *brauchen* 'need' (cf. Takahaši (1984, 21), Engel (1996), Askedal (1997a, 62)), *werden* (Vater

(1975), Engel (1996), Enç (1996), Erb (2001, 176)), *scheinen* (Askedal (1998, 61), Wurmbrand (2001, 205)), *drohen* and *versprechen* (Askedal (1997b), Wurmbrand (2001, 205)). In some rare cases, even *lassen* exhibits an epistemic reading, as pointed out by Reis (2001, 308).

It is contested to which extent these items really belong to the same class as the six traditional modal verbs. First of all, there is no agreement whether all of these items indeed involve epistemic semantics. Öhlschläger (1989, 8) denies that *brauchen* allows for an epistemic interpretation, Reis (2005b) argues that *drohen* and *versprechen* should be considered as aspectual verbs rather than epistemic modal verbs. Secondly, some authors assume that the class defining property for modality is poly-functionality. Therefore, they reject all verbal items that do not involve both types of modality. According to Öhlschläger (1989, 8), *brauchen* cannot be regarded as a modal verb since it lacks an epistemic reading, whereas *werden* has to be excluded for the absence of a circumstantial interpretation. Since the decision of which of these items indeed involve epistemic modality requires a thorough investigation of empirical data, it will be postponed to Section 4.2, where each verb will be individually reviewed with respect to the CoDeC.

Even if the availability of an epistemic interpretation appears to be a powerful criterion, it does not equally apply to all of the six traditional items. Firstly, the canonical non-circumstantial uses of *wollen* ‘claims to’ and *sollen* ‘is said to’ differ from genuine epistemic modals. While the latter refer to a conclusion that is drawn by the speaker, the former express a claim by the grammatical subject (in the case of *wollen*) or some non-specified source (*sollen*). As Reis (2001, 294) points out, these instances of *wollen* and *sollen* are to a greater degree acceptable as non-finite forms than epistemic modals are. This might be due to the fact that they involve more argument structure than their epistemic counterparts: *wollen* is a control verb and has a subject argument on its own and *sollen* contains some unspecified covert argument. Hence, there are plenty of reasons to treat these readings separately from epistemic modality. Such an approach is furthermore supported by the observation that they might violate the CoDeC. Being always related to some claim, they will be referred to as *reportative* in the remainder of this study. Secondly, *dürfen* can never be interpreted epistemically unless it is inflected for past subjunctive (*dürfte*). As it will be shown in Section 4.2.5, deontic *dürfen* and epistemic *dürfte* differ with respect to the modal force they involve: deontic *dürfen* is a well behaved possibility modal verb, epistemic *dürfte* appears to express a stronger modal force than that. Therefore, *dürfte* should be considered as an independent lexical item. Thirdly, most authors in contemporary research treat *möchte* as an independent lexical item as well, such as Öhlschläger (1989, 7), Kiss (1995, 162), Fritz (1997, 103), Diewald (1999, 144), Axel (2001, 40) or Wurmbrand (2001, 183). Since none of them attests it with an epistemic interpretation, strictly speaking it could not be regarded as a modal verb.

Regardless of these discrepancies, the availability of an epistemic interpretation turned out to be the most promising property. If the class of modal verbs is defined based upon epistemicity, only a small group of verbs comes into consideration. In the upcoming Section 4.2, all of these potentially epistemic verbs will be carefully reviewed with respect to the CoDeC. Nevertheless, this approach will not result in a modal class in its traditional extension.

4.1.4 Conclusion

As it turns out, the six traditional modal verbs do not form a class that can empirically be justified. All of the criteria that come into consideration fail. This affects morphological ones (preterite present paradigm, obligatory IPP), syntactic ones (sub-categorisation of bare infinitives) and semantic ones (availability of an epistemic interpretation). Therefore, a lot of authors have already conceded that the class of modal verbs in its traditional extension is arbitrary and not well defined, cf. Welke (1965, 12), Birkmann (1987, 5), Öhlschläger (1989, 7) and Fritz (1997, 14).

Thus, it becomes clear why different authors assume classes of modal verbs with divergent extensions. Some of these classes that have been a basis for influential theories are exemplified below:

- Kratzer (1981, 40) modal auxiliaries in German: *muss, kann, darf, soll, wird, mag, müßte, könnte, dürfte, sollte, würde, möchte* – **without *wollen***
- Kratzer (1991, 650) some modals: *muss, kann, soll, wird, dürfte,*
- Fritz (1991, 46): epistemic modals in Contemporary German: *dürfte, kann, könnte, mag, muss, müßte, soll, will, wird*
- Wurmbrand (2001, 137) modal auxiliaries in German: *dürfen, dürfte, können, möchte, müssen, sollen, wollen* – **without *mögen***
- Erb (2001, 75) modal verbs in German: *können, müssen, dürfen, sollen, wollen, mögen, werden*

These authors are not always explicit as to why they exclude some of the verbs that are traditionally considered as modal verbs.

Since the traditional class of modal verbs cannot be empirically justified, one could argue for a mere extensional definition. This would be plausible if these six verbs invariably involved auxiliary-like properties through ages. But as it turns out, during the Old High German period, each of these verbs was grammaticalised to a different extent. Birkmann (1987) and Diewald (1999) agree that *sollen, wollen* and *mögen* are already highly frequent as grammaticalised verbs with infinitive complements and modal semantics in Old High German. Opposed to this, the remaining traditional modals *können* and *müssen* are hardly attested in such an auxiliary-like use in this period or even not at all, in the case of *dürfen*. As illustrated by Birkmann (1987), *dürfen* only started to select infinitive complements during the late Middle High German period. Apart from that, he points out that there is one more grammaticalised preterite present in Old High German that occurs with modal meaning: *eigan* ‘have’. As Wurzel (1984) shows, it appears that most of the preterite presents in Old High German involve too much lexical content in order to be considered as modal auxiliary. This seems to contradict the position entertained by Fritz (1997, 13), who claims that all of the six traditional modal verbs already exhibited modal semantics in Old High German. But as it has already been discussed in Section 4.1.3, a lot of authors use a rather fuzzy concept of modality, therefore the two diverging positions need not be a contradiction at all.

This again demonstrates that the six traditional modal verbs did not become what they are as a chunk, but rather each verb had its own individual development and its own pace. Meanwhile, some modals got lost such as *eigan* or are likely to get lost such as *mögen*, but there are also new members in the group, such as *möchten*, which has already developed a full paradigm at least in spoken language, as shown by Vater (2010).

The process of grammaticalisation turns out to be even more complex. Focussing on an individual verb, it is not obvious that it acquired all features of auxiliary-hood at the same time. Even if *sollen* was already highly grammaticalised in Old High German, it is attested with IPP only in the 16th century, more than hundred years after the first modal verb. It appears, then, that each property of auxiliary-hood develops independently and the sequence of acquisition may differ from verb to verb.

A different strategy could be an attempt to argue for a complex definition that relies on a variety of features, as suggested by Zifonun (1997, 1253). She argues that modal verbs are the class of verbs that (i) select bare infinitives, (ii) lack imperative morphology, (iii) have a fully developed paradigm of tense morphology, (iv) lack arguments on their own and (v) that are evaluated with respect to a conversational background. But as she acknowledges herself, none of these criteria hold without restriction.

These facts lead to the conclusion that there is no reason at all to maintain the class of modal verbs in its traditional extension. But there is an alternative. Since the availability of an epistemic interpretation is restricted to a rather small group of verbs, it could serve to establish a homogeneous class. Such an approach has been undertaken by Engel (1996, 463) and Reis (2001, 312). As shown above, there are more verbs than the six traditional modal verbs that come into consideration for an epistemic interpretation, in particular *brauchen* and *werden*. As a consequence, they have to adapt the extension of their class of modal verbs accordingly. Both authors argue that there is a strong link between the selection of a bare infinitive complement and the availability of an epistemic reading, cf. Reis (2001, 308).

However, there are some minor discrepancies in their accounts. First of all, they identify reportative modality contributed by *wollen* and *sollen* with epistemic modality, and second, there is only scarce evidence that *brauchen* indeed involves an epistemic reading that is subject to the CoDeC, as it will be demonstrated in Section 4.2.9. Nevertheless, the approach elaborated by Engel (1996) and Reis (2001) will be adopted here. In the next section, it will be empirically reviewed in much detail, in order to find out which verbs are captured by this class definition.

Before closing this section, one last plausible criterion for auxiliary-hood will briefly be addressed. As Grimm (1822, 851) argues, an essential property of auxiliaries is that they are more frequent compared to lexical main verbs. According to his view, auxiliaries are ‘*verba welche sehr häufig gebraucht werden und statt ihrer lebendigen bedeutung abstracte begriffe annehmen*’ (‘verbs that are frequently used and that involve abstract concepts rather than their original lexical meaning’). This can easily be tested by means of a corpus.

Based on the data collected by Ruoff (1981), the most frequent verbs in spoken German from Baden Württemberg (South West Germany) are the ones illustrated in Figure 4.3. Once more, it turns out that the six traditional modal verbs behave fairly differently. Whereas *müssen* and *können* are among the most frequent verbs, *mögen* is rather rare. As a consequence, neither frequency can serve to establish a class of modal verbs.

This data is not reliable for a couple of reasons. Firstly, the corpus is too small to be sig-

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sein ('be', PRF.AUX)	24,11%	lassen ('let')	0,53%
haben ('have', PRF.AUX)	22,72%	stehen ('stand')	0,53%
kommen ('come')	3,78%	sehen ('see')	0,51%
gehen ('go')	3,31%	laufen ('run')	0,50%
müssen ('must')	3,24%	sollen ('shall')	0,48%
werden ('become', PASS.AUX, FUT.AUX)	2,67%	bringen ('bring')	0,41%
machen ('make')	2,58%	kaufen ('buy')	0,38%
sagen ('say')	2,26%	brauchen ('need')	0,37%
können ('can')	2,01%	ziehen ('draw')	0,36%
wissen ('know')	1,21%	dürfen ('may')	0,36%
tun ('do')	1,19%	glauben ('believe')	0,34%
geben ('give')	1,1%	helfen ('help')	0,33%
wollen ('want')	0,83%	meinen ('think')	0,30%
schaffen ('manage')	0,82%	...	
kriegen ('get')	0,78%	möchten ('want')	0,08%
fahren ('drive')	0,72%	...	
heißen ('mean')	0,61%	mögen ('like')	0,04%
nehmen ('take')	0,58%	...	

Table 4.3: Most frequent verbs in spoken German, according to Ruoff (1981), based on a corpus study comprising 500 000 word form tokens.

nificant, it only comprises 500 000 word form tokens. Secondly, the annotation is not precise enough. As it will be shown in Section 4.2, some of the verbs such as *können*, *mögen* or *wollen* also involve transitive uses or finite *dass*-clauses. In these instances the lexemes mentioned above clearly behave like main verbs, accordingly, they cannot be regarded as auxiliaries. Therefore, these occurrences should be ignored. But nevertheless, even if only modal verbs with infinitives are considered, they are not more frequent than other common main verbs. Finally, some of the verbs enlisted here are part of lexicalised idiomatic expressions, such as *heißen* which frequently occurs in *das heißt* 'that is to say'. It is not obvious whether this can still be considered as occurrence of a main verb or whether rather a reanalysis of the whole chunk to another category, such as a discourse marker, has taken place.

Altogether, this small survey might appear imprecise but at least it gives a taste of the different frequencies of the individual modal verbs. Nevertheless, it turns out that a remarkably high percentage of the most frequent verbs involves a predicate complex formation. Maybe, it is possible to recast Grimm's (1822) original idea in new terms: whenever a verb is frequently used it is likely that it undergoes predicate complex formation, in the spirit of Höhle (1978), Haider (1993, 2010), Kiss (1995) and Müller (2002).

Welke (1965, 19) refers to another corpus based on the frequency of modal auxiliaries that has already been undertaken by Kaeding (1897). In his corpus that obviously consisted of written texts, Kaeding extracts the following frequencies: *können* 52 384, *lassen* 32 143, *müssen* 30 350, *wollen* 27 834, *sollen* 23 910 *mögen* 14 406, *dürfen* 9 432.

This tendency is reflected by the results of the small corpus study undertaken by Diewald

sein ('be', PRF.AUX)	2,83%	müssen ('must')	0,28%
haben ('have', PRF.AUX)	1,21%	sollen ('shall')	0,22%
werden ('become', PASS.AUX, FUT.AUX)	1,22%	wollen ('want')	0,16%
können ('can')	0,48%	mögen ('like')	0,13%
lassen ('let')	0,29%	dürfen ('may')	0,09%

Table 4.4: Frequency of auxiliaries among all word form tokens, according to Kaeding (1897), based on a corpus study comprising 10.910.777 word form tokens.

(1999, 9). She has investigated a corpus that contained 839 modal verbs. The frequency of the different verbs is as follows: *können* 319 (38,02%), *müssen* 182 (21,69%), *wollen* 152 (18,12%), *sollen* 100 (11,92%), *mögen* 48 (5,72%) and *dürfen* 38 (4,53%).

Overall, the picture is similar: *können* and *müssen* are the most frequent ones, *mögen* and *dürfen* are less frequent. However, there are some small differences. There are a couple of ways to account for them. First of all, the corpora are composed of completely different text sorts: while Kaeding collected written language, Ruoff focussed on spoken language of a variety spoken in South East Germany. Moreover, the data compiled by Kaeding is at least 100 years older than Ruoff's data. This might already explain why the frequency of *mögen* is much higher in Kaeding's corpus, since it was one of the dominant verbs in the earlier stages of German.

4.2 Case studies

All the different verbs discussed so far come across in different guises. In the upcoming section, it will be systematically reviewed in which syntactic distribution each of these verbs can occur. The following patterns will come into consideration: transitive verbs, verbs with directional phrases, control verbs and raising verbs. As will be shown in great detail in Chapter 5, circumstantial modality can be rephrased as event modification and epistemic modality as propositional modification. Authors that follow the tradition of Lyons (1977, 799) additionally distinguish between a 'subjective' and 'objective' epistemic interpretation. However, as it will be shown in Section 6.22 such a distinction is misleading and the assumption of a separate category 'objective' epistemic modality introduces more problems than it solves. Moreover, all of the different patterns under investigation will be illustrated by means of empirical data taken from the German reference corpus DeReKo. It is composed by the *Institut für Deutsche Sprache Mannheim* and it comprised about 2 billion word tokens when the study presented here was carried out.

In order to illustrate the nature of the verbs discussed below, it is sometimes important to take a diachronic perspective. Following this insight, historical data will be discussed at several occasions. At some other points, a brief view on the diachronic development can be revealing.

4.2.1 können

Depending on its distribution, *können* contributes a couple of rather different semantic concepts ranging from an ability to an epistemic possibility. In more syntactic terms, it can be realised as a transitive verb, as a control verb and as a raising verb. In addition, it also occurs with verbless

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directional phrases. There is one particular use of *können* that reveals its underlying semantic nature: the quantificational use as discussed by Carlson (1977, 119) and Brennan (1993, 1997). As Brennan (1993, 102) demonstrates, there is no plausible alternative to analyse this use of *können* as an existential quantifier (\exists) that binds the variable contributed by the indefinite NP, as will be demonstrated below.

Transitive uses

There has been a great discussion about the precise status of modal verbs without infinitival complements as the instance of *können* below in (24) illustrates.

- (24) Die Bewerber können Russisch.
the applicants can Russian
'The applicants can speak Russian'

As Öhlschläger (1989, 68) discusses, the essential question is how the lack of the infinitive can be accounted for. Two conflicting approaches have been undertaken so far. On the one hand, these occurrences could be treated as an ellipsis of the infinitive and as a consequence the remaining objects would be arguments of the elided verb. Such an approach has already been suggested by Heyse (1822, 403), who argues that the traditional modal verbs always require an infinitive complement. On the other hand, one could assume that these cases are instances of transitive verbs. Accordingly, the remnant objects would belong to the (modal) verb.

What criteria can be invoked in order to decide the nature of these patterns? According to Öhlschläger (1989, 69), the essential matter is whether the elided infinitive can be unambiguously determined. In the case of *wollen* without infinitive, it is always possible to insert the verb *haben* 'have' or *bekommen* 'get' in the gap. Therefore, Öhlschläger (1989) concludes that these cases of *wollen* involve ellipsis. As Öhlschläger (1989, 71) furthermore argues, it is not so easy to reconstruct the elided infinitive in the case of *können*. Accordingly, he assumes that these instances are true transitive verbs.

If any of these cases discussed above indeed involve ellipsis, (i) it should be possible to specify its particular type. Since canonical cases of ellipsis affect rather syntactic configurations than specific predicates, it is expected (ii) that all types of embedded infinitives (ditransitive verbs, verbs with dative arguments, verbs with genitive arguments, ...) are affected to the same extent and (iii) it should have no impact on the grammaticality of the entire utterance whether the matrix predicate is passivised or not.

At first, it appears that Öhlschläger (1989) uses a rather intuitive concept of ellipsis. In their typologies, Winkler (2006) and Merchant (2009) distinguish between six different types of ellipsis. Opposed to the cases discussed here, all of their subtypes concern particular syntactic configurations that involve clausal conjunction. In particular, the elided phrase has an overt antecedent in the first conjunct. Moreover, there is no type that only affects an embedded infinitive without its complement. In gapping, the finite verb is elided (25) and, in VP-ellipsis, the entire VP (26) (examples by Winkler 2006).

- (25) Manny [plays]_i the piano and Anna _i the flute.
(26) They [play the piano]_i but Anna doesn't _i.

Modal verbs without an infinitive complement such as in (24) cannot be derived from VP-ellipsis in German for one more reason. In contrast to English, the VP is phonetically not completely elided but realised as the VP-anaphora *es*, as López and Winkler (2000, 624) have pointed out. Thus, it becomes evident that the type of ellipsis that Öhlschläger (1989) has in mind would be completely different in nature. In a similar manner, *können* with an accusative NP cannot be analysed as a fragment in terms of Merchant (2009), as fragments are typically incomplete answers to *wh*-questions. Yet, it remains to be checked whether this pattern could be regarded as a “situational ellipsis” which are discussed by Schwabe (1994, 2).

Secondly, this type of ellipsis would arouse particular suspicion since it only affects a semantically restricted group of embedded infinitives. If the matrix predicate is *wollen* the elided infinitive could only be identified with *haben* ‘have’ or *bekommen* ‘get’. In the case of *mögen*, there is only one verb that comes into consideration: *leiden* ‘suffer/be seriously affected’. *können* turns out to be the least restrictive matrix verb; the gap could be interpreted as ellipsis of *verstehen* ‘understand’, *sprechen* ‘speak’ or *machen* ‘make’ (and related concepts). It should attract particular attention that all of these verbs that can potentially be subject to ellipsis are transitive verbs that precisely contribute a NP with accusative case. This is somewhat unexpected. Indeed, it should be possible to elide any type of infinitive irrespective of its argument structure. Interestingly, ellipsis does not apply as soon the transitive verb is replaced by a non-transitive synonym, as it is illustrated by the contrast between (27) and (28). Likewise, an infinitive needs to be realised whenever the sole argument is a dative NP, like in the case of *helfen* ‘help’ (29).

- (27) Der Herbert kann Russisch (sprechen).
 the Herbert can Russian speak-INF
 ‘Herbert can speak Russian’
- (28) Der Herbert kann auf Russisch sogar über Wissenschaftsgeschichte #(sprechen).
 the Herbert can in Russian even about history.of.science speak-INF
 ‘Herbert is able to even talk about history of science in Russian’
- (29) Der Herbert kann dem David #(helfen).
 the Herbert can the-DAT David help-INF
 ‘Herbert is able to help David.’

This behaviour is completely unexpected for an account in terms of ellipsis, even for one that assume lexical licensing. In a similar vein, such an approach could not explain why patterns such as (27) can only be interpreted with an ability reading but never with a permission, practical possibility or epistemic reading, which is always possible in the presence of an infinitive. Finally, it is not clear as to why ellipsis can never apply to two place predicates that select a dative predicate such as *helfen* ‘help’.

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A further strong argument in favour of a transitive analysis comes from data from passivisation. In contrast to Welke (1965, 14) and Helbig and Buscha (2001, 116) who assume that modal verbs are generally incompatible with passive, instances of passivised forms of *können* can be found in corpora in which they behave like a prototypical transitive verb, such as (30) or (31):

- (30) Auch dem Skispringer geht im Ernstfall eines Wettbewerbs ein
 even the ski.jumper goes in.the case.of.emergency a-GEN competition-GEN a
 Gutteil von dem verloren, **was** erlernt, eingeübt ist – scheinbar so
 bulk of that lost what learned, trained is apparently so
 schlafwandlerisch **gekonnt wurde**²¹
 somnambulisticly can-PRT.PAS PAS.AUX
 ‘Even the ski-jumper forgets most of what he has learnt, what he has trained and what he had
 apparently been able to do in his sleep.’
 lit: what he apparently could do in his sleep
- (31) So kann beispielsweise im Handel gepunktet werden, wenn **eine**
 so can for.example in.the commerce scored PAS.AUX if a
mitteleuropäische Sprache, eventuell auch Russisch, **gekonnt wird**²²
 central-European language maybe also Russian can-PRT.PAS PAS.AUX
 ‘For example, it can be advantageous in business if you can speak a central European lan-
 guage and perhaps even Russian’
 lit: if you can speak a central European language

Defending an analysis that assumes ellipsis, one could argue that the infinitive has just been elided in these examples above. But, then, it is expected that cases of passives in which the infinitive is spelled out should be equally acceptable. As it turns out in (4) and (33), this is clearly not the case:²³

²¹DeReKo: N97/DEZ.51590 Salzburger Nachrichten, 22.12. 1997.

²²DeReKo: P95/APR.14638 Die Presse, 28.04. 1995.

²³Some authors such as Zifonun (1997, 1255), Erb (2001, 90) Wurmbrand (2001, 202) argue that passives with overt infinitives are indeed acceptable:

- (i) Auch sterben muß gekonnt sein/werden.
 also die-INF must can-PRT.PAS be-INF/PAS.AUX.PST.INF
 ‘You must learn the skill of death.’
- (ii) ? Karriere machen wird von Frauen oft gewollt.
 career make-INF PAS.AUX.PST by women often want-PRT.PAS
 ‘Often Women want to make a career for themselves.’
- (iii) ? Aufsätze schreiben wird heutzutage von keinem Schüler mehr gekonnt.
 essays write-INF PAS.AUX.PST nowadays by no pupil anymore can-PRT.PAS
 ‘Pupils can no longer write essays in these days.’

But, in both cases, the grammaticality of the utterance is rather doubtful. Moreover, it is not clear whether the verbs *sterben*, *machen* and *schreiben* are not indeed nominalisations rather than true infinitives. In both cases, the presence of an correspondingly inflected article *das* would considerably increase the acceptability. Aside

- (32) * Das wurde **tun** gekonnt.
that PAS.AUX.PST do-INF can-PRT.PAS
Intended interpretation: ‘They were able to do it.’
- (33) * Russisch wird **sprechen** gekonnt.
Russian PAS.AUX.PRE speak-INF can-PRT.PAS
Intended interpretation: ‘They can speak Russian.’

Arguably, examples of passivised *können* without an infinitive complement are rare in written speech. Thus, one could conclude that they are part of a phenomenon that is not relevant to grammatical description. However, the reason as to why they do not occur so frequently might be for pragmatic reasons. Besides *können*, there are typical transitive verbs that cannot often be found in passivised forms such as the preterite *wissen*, as it has been pointed out by Adelung (1801, 1581). Nevertheless, passivised examples of *können* exist. And as opposed to other members of the traditional modal verb class, they prove much more acceptable. Similar contrasts have been shown by Hetland and Vater (2008, 104).

- (34) * Russisch wird (von allen) gemusst
Russian PAS.AUX.PRE by everyone must-PRT.PAS
‘Everyone must speak Russian.’
- (35) * Russisch wird (von allen) gesollt
Russian PAS.AUX.PRE by everyone shall-PRT.PAS
‘Everyone shall speak Russian.’
- (36) * Russisch wird (von allen) gedurft
Russian PAS.AUX.PRE by everyone may-PRT.PAS
‘Everyone is allowed to speak Russian.’

from that, all of these examples involve topicalisation of the infinitive complement, in the latter two cases, it is arguably a topicalisation of the entire VP. This is also in favour of an analysis that treats the topicalised infinitives as nominalisations that act as subject NPs. If (ii) and (iii) did indeed involve genuine infinitive complements, it is expected that the infinitive should be able to remain at the right periphery. In such a configuration, the NP *Aufsätze* would become the subject of the passive auxiliary *werden* and enter an agreement relation.

- (iv) * Aufsätze werden heutzutage von keinem Schüler mehr schreiben gekonnt.
essays PAS.AUX.PST nowadays by no pupil anymore write-INF can-PRT.PAS
‘Pupils can no longer write essays in these days.’

Furthermore, the option with the copula *sein* in Zifonun’s (1997) example is clearly preferred. This is not surprising, since *gekonnt* in the clause above could also be interpreted as adjective. If so the whole pattern with the copula *sein* could be interpreted as stative passive which is syntactically something completely different from the canonical *werden*-passive, as shown Maienborn (2007). The option with *werden* is at best acceptable if *sterben* is interpreted as nominalisation and if a corresponding article is introduced.

All of these circumstances indicate that the instances of *können* and *wollen* in the passivisations above involve transitive patterns that select nominalised subject NPs. This is further supported by the fact that those of the traditional modal verbs that cannot be used in a transitive way such as *müssen* would be even less grammatical in the environments above.

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In order to account for all these contrasts, it is necessary to accept that there are transitive uses of *können*. This is further supported by the diachronic development of the traditional six modal verbs. As observed by Fritz (1997, 68), the predecessors of the traditional six modal verbs in Contemporary German occur occasionally with NP complements in Gothic. Birkmann (1987, 118) attests for Gothic *þaurban* ‘need’, *kunnan*, *gamōtan* ‘have freedom’ as lexical main verbs and for Old High German *kunnan* and *thurfan*, cf. Birkmann (1987, 161). In a similar vein, Abraham (2004, 137) observes that in general non-finite complements have developed out of nouns. Whereas *zu*-infinitives have their origin in noun phrases marked with dative case, bare infinitives emerged out of noun phrases with accusative case. This is further enforced by Paul (1920, 95) who demonstrated that the bare infinitive complements originally go back to an NP-complement with accusative. Here, some examples for transitive *kunnen* from Middle High German, late 12th century:

- (37) oder swer hie welsche sprâche kan.²⁴
or whoever here foreign-ACC language-ACC can
‘or whoever here can speak a foreign language’
- (38) ine kan decheinen buochstap.²⁵
I.NEG-CL can no-ACC letter-ACC
‘I don’t know any letter - I am illiterate.’
- (39) leider des enkan er niht.²⁶
unfortunately this-GEN he NEG-CL.can NEG
‘Unfortunately, he is not able to do this.’
- (40) ruochts got, ich pin vor valsche vrî: // ich enkan decheinen
wants.it God I am for deceitfulness free I NEG.CL-can no-ACC
widersaz.²⁷
hostility-ACC
‘God willing, I am free of any deceitfulness, I am not able to commit any hostility.’
- (41) got noch künste kan genuoc.²⁸
God still arts-ACC can enough
‘God is full of powers.’

As it appears, *kunnen* was originally a transitive verb and acquired its infinitive complement only in the course of time. This observation is further supported by Diewald (1999, 34), who assumes that the modal verbs in Contemporary German generally started out as lexical main verbs that belonged to the class of transitive verbs. In some rare cases, they occur even with passive morphology. This leads us to the conclusion that these instances have to be analysed as true transitive verbs instead of an ellipsis of the infinitive. An approach in terms of ellipsis could only be maintained under the assumption that the ellipsis is licensed by the lexical semantic of

²⁴Wolfram, *pârzival*, 115,27 (1200).

²⁵Wolfram, *pârzival*, 115,27 (1200).

²⁶Wolfram, *pârzival*, 193,09 (1200).

²⁷Wolfram, *pârzival*, 439,21 (1200).

²⁸Wolfram, *pârzival*, 796,16 (1200).

the matrix verb. It would be necessary, then, to add to the respective lexicon entries the precise information under which conditions an ellipsis is licensed. This concerns in particular the infinitives that can be elided under the respective matrix verb. It might turn out that such an approach is fairly laborious. Unless there is no concrete attempt to investigate the precise conditions of licensing, we continue to assume that all these *können* without infinitive are transitive uses, as it has been assumed by Öhlschläger (1989, 69) and Erb (2001, 96). Finally, Becker (1836, 178) has already observed that transitive *können* appears to have a very specific meaning: it always seems to express a knowledge rather than an ability. This is on par with its etymology: originally, it referred to a mental knowledge rather than to a physical ability. For the latter purpose, its counterpart *mögen* was used.

Control infinitives with event modification

The essence of being a control verb is to contribute an independent subject argument. In the case of the traditional modal verbs, this subject argument is equally the source of modality. According to Palmer (1986, 16) following Wright, these cases are the proto-typical instance of dynamic modality. In its dynamic interpretation *können* ascribes an ability to the matrix subject. Therefore, it needs to involve an independent subject argument to identify the holder of the ability.

- (42) „Ich kann mir den Höhenflug nicht erklären” Wirtschaftsminister
 I can REFL the altitude.flight NEG explain-INF minister.for.economic.affairs
 zu Guttenberg über seinen Aufstieg.²⁹
 zu Guttenberg about his advancement
 ‘“I can’t explain my success NEG” Minister for Economic Affairs zu Guttenberg about his advancement.’
- (43) Ihre Bedeutung ist allerdings so sehr vom Zusammenspiel mit anderen
 its meaning is however so much from.the interaction with other
 Faktoren abhängig, dass nur professionelle Penisleser sie richtig
 factors dependent that only professional penis.readers they correctly
 auslegen können.³⁰
 interpret-INF can
 ‘However, its meaning is related to so many other factors that only professional penis readers can correctly interpret them.’

There are at least three ways to test for that. Control predicates (i) should not embed infinitives that lack a referential subject, (ii) they should not tolerate *de dicto* interpretations of quantified subjects and (iii) they should not exhibit voice transparency. Note, however, that all the verbs under investigation here are ambiguous between numerous interpretations that often differ only in subtleties. In the case of *können*, there are at least three readings that partly overlap: the ability of the subject versus general possibility versus epistemic possibility. Whenever *können* denotes an ability of its subject, it cannot embed predicates without referential subject arguments (44)

²⁹DeReKo: NUN09/SEP.01543 Nürnberger Nachrichten, 14.09. 2009.

³⁰<http://astrogenital.de/html/penislesen.html>, accessed in November 2010.

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or predicates without subject at all (45). Accordingly, if the raising test employed by Perlmutter (1970, 108), Brennan (1993, 41), Pollard and Sag (1994, 137), Axel (2001, 39), Wurmbrand (2001, 189), Erb (2001, 85), Müller (2002, 46; 2007, 256) cannot be applied, which indicates that this use of *können* is a control verb. Nevertheless, the general possibility reading remains available.

- (44) # Es kann_{abil} schneien.
it can snow-INF
'Intended reading: it has the ability to snow.'
- (45) # ... dass getanzt werden kann_{abil}.
that getanzt-PRT.PAS PAS.AUX.INF can.
'Intended reading: ...that it has the ability to be danced'

Of course, whenever there is no referential subject argument present, the dynamic use of *können* fails to identify the bearer of the ability. Moreover, von Stechow (2003, 203) points out that control verbs that take quantified subjects only allow *de re* interpretations, in which the quantified subject takes scope over the modal operator. This is expected since the control verb has a subject argument on its own this argument can never be interpreted as the subject of the embedded infinitive. In contrast, *de dicto* interpretations, in which the modal verb takes scope over the quantifier in subject position, are excluded. This is only possible if the quantified subject originally belongs to the embedded infinitive – a configuration that is excluded with control verbs:

- (46) Kein Student kann_{abil} Dänisch (sprechen).
no student can Danish speak-INF
OK: *de re*, $\neg > MV$, 'For no student_i: x_i has the ability to speak Danish.'
#: *de dicto* $MV > \neg$ 'x_i has the ability that'

Finally, as already demonstrated by Newmeyer (1970, 191), Jackendoff (1972, 105), Ebert (1976, 39), Öhlschläger (1989, 77), Pollard and Sag (1994, 136), Kiss (1995, 163), Diewald (1999, 62), Erb (2001, 92), Reis (2001, 301), Reis (2005b, 139), von Stechow (2003, 205) and Hornstein (2003, 8), control verbs are not transparent with respect to voice. Whenever occurring as main clause, an active sentence (47a) expresses the same proposition as its corresponding passivisation (47b). Whenever they are embedded by a control predicate, the subject of the clause is assigned an additional semantic role, the one that is contributed by the control predicate. Note that active and passivised clauses differ with respect to the argument that is realised as subject. In each case a different argument will be semantically marked as the subject argument. Therefore, control predicates are not transparent with respect to voice.

- (47) a. Der Reinhold bezwingt den Nanga Parbat ohne Sauerstoffgerät.
the Reinhold conquers the-ACC Nanga Parbat without oxygen.apparatus
'Reinhold conquers the Nanga Parbat without oxygen apparatus.'

- b. Der Nanga Parbat wird vom Reinhold ohne Sauerstoffgerät
 the-NOM Nanga Parbat PASS.AUX by.the Reinhold without oxygen.apparatus
 bezwungen.
 conquer-PPP
 'The Nanga Parbat is conquered by Reinhold without oxygen apparatus.'
- (48) a. Der Reinhold kann_{abil} den Nanga Parbat ohne Sauerstoffgerät
 the Reinhold can the-ACC Nanga Parbat without oxygen.apparatus
 bezwingen.
 conquer-INF
 'Reinhold has the ability to conquer the Nanga Parbat without oxygen apparatus.'
- b. # Der Nanga Parbat kann_{abil} vom Reinhold ohne Sauerstoffgerät
 the-NOM Nanga Parbat can by.the Reinhold without oxygen.apparatus
 bezwungen werden.
 conquer-PPP PASS.AUX-INF
 'Intended reading: the Nanga Parbat has the ability to be conquered by Reinhold without
 oxygen apparatus.'

Turning back to the ability reading of *können*, the source of the ability is identified with *Reinhold* in example (48a). In contrast, the source of ability would be assigned to the *Nanga Parbat* in clause (48b). Since it is not evident as to whether mountains can be regarded as licit bearers of abilities, the interpretation of (48b) is rather odd. A similar discussion is summarised by Reis (2001, 301). In essence, the two sentences are not semantically equivalent; accordingly *können_{abil}* has to be considered as a control verb. In a similar vein, Wurmbrand (1999, 604) and Wurmbrand (2001, 199) argue that control verbs generally fail to embed passivised complements. Brennan (1993, 45) applies a similar test that employs symmetric predicates instead of passivisation.

There is widespread consensus to analyse the ability reading of *können* as a control structure, as it has been suggested by Welke (1965, 49), von Stechow and Sternefeld (1988, 429), Wurmbrand (2001, 171), Axel (2001, 40), Reis (2001, 302) and Erb (2001, 78).

Raising infinitives with event modification

There has been a great debate on the syntactic nature of non-epistemic (circumstantial or root) modal verbs. As Reis (2001, 300) demonstrates, three main positions can be distinguished. Originally, all circumstantial modal verbs were considered as control verbs. Opposed to that, epistemic modal verbs were treated as raising verbs. The basic idea dates back to Ross (1969, 86) who assumes that root and epistemic modal verbs are derived from different deep structures. Whereas root modals originate from two place predicates, epistemic modals involve one place predicates. This idea was further developed by Jackendoff (1972, 102), Brennan (1993, 25), von Stechow and Sternefeld (1988, 429), Diewald (1999, 62) and, finally, Abraham (2001, 18ff.), Abraham (2002, 36ff.), Abraham (2005, 241, 257, 261). Often, these approaches have not been systematically developed and remain rather superficial. In particular, this concerns Jackendoff (1972, 102) and von Stechow and Sternefeld (1988, 429) who discuss only one or two items

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and who fail to give an exhaustive description of the entire group of the traditional modal verbs. Most of these authors acknowledge that circumstantial modals can also be found in raising configurations. Following the observations discussed by Newmeyer (1970, 191), Jackendoff (1972, 105) was already aware that modal verbs behave with respect to voice transparency like raising verbs whenever the object of the embedded infinitive is inanimate, such as the *Nanga Parbat* in example (48). von Stechow and Sternefeld (1988, 446) notice that each modal verb can also be realised as a raising pattern. Finally, Brennan (1993, 27) concedes that *ought-to-be-deontics* have to be analysed as raising verbs, following the assumption made by Feldman (1986, 177), who argues that they must be one-place predicates. Such an approach faces additional difficulties since the use of (reportative) *wollen*, which is traditionally considered as an epistemic modal verb, involves a control pattern – this will be thoroughly discussed in Section 4.2.3.

A second tradition put forth by Welke (1965, 49) and Höhle (1978, 81, 84) argues that most circumstantial modals are even one place predicates without a subject argument on their own. This approach has been adopted and developed by Öhlschläger (1989, 105), Palmer (1990, 47), Geilfuß (1992), Kiss (1995, 163), Axel (2001, 40), Reis (2001) and Erb (2001, 73). According to their view, some circumstantial modals such as volitional *wollen* and *möchte* are nevertheless to be analysed as control patterns. The third position defended by Wurmbrand (1999), Wurmbrand (2001, 201) and Gergel and Hartmann (2009, 327) assumes that modal verbs are always raising verbs. Whereas Wurmbrand (2001, 201) analyses volitional verbs like *wollen* and *möchte* rather as main verbs, Gergel and Hartmann (2009) assume that they involve oblique raising into theta positions. Finally, Barbiers (2002, 67) argues for an intermediate position claiming that all circumstantial modals occur with both patterns: control and raising.

Turning back to *können*, it appears that its use as a raising verb covers a broad range of different readings. Notably, it denotes a practical possibility. Moreover, it can involve deontic permission readings and quantificational readings. Applying the same diagnostics for the existence of a subject argument that were discussed in the last section, it turns out that these instances of *können* behave fairly differently. First of all, they do not require referential subjects any longer and as a consequence the tests proposed in the preceding section can be applied without any problem. Such instances are also attested in corpora, as it is indicated in (53)–(54).

- (49) Es kann_{perm} (hier ruhig) schneien.
 it can here PAR snow-INF
 ‘It’s okay if it snows here.’
- (50) ... dass (ruhig) getanzt werden kann_{perm}.
 that getanzt-PPP PASS.AUX-INF can.
 ‘It’s okay if you dance here’
- (51) Es kann_{poss} (hier manchmal) schneien.
 it can here PAR snow-INF
 ‘It can snow here from time to time.’
- (52) ... dass (hier manchmal auch) getanzt werden kann_{poss}.
 that dance-PPP PASS.AUX-INF can.
 ‘People dance here from time to time.’

- (53) Reisezeit: Der Montblanc lässt sich am besten von Ende Juni bis Anfang
 travel.season the Mountblanc let RELF at.the best from end June until begin
 September umrunden. Auch im Hochsommer kann es schneien.³¹
 September round also in.the midsummer can it snow-INF
 ‘Travel season: for those who want to hike around the Montblanc, it is recommended to
 envisage this tour between the end of June and the begin of September. But it can also snow
 in midsummer.’
- (54) Zwar sprechen viele Holländer gut Deutsch, dennoch kann es
 indeed speak many Dutch well German yet can it
 Mißverständnisse geben, wenn Gleiches unterschiedlich gedeutet wird.³²
 misunderstandings give-INF if same differently interpreted is
 ‘Many Dutch may speak German very well, but there can be misunderstandings if the same
 things are interpreted in a different manner.’
- (55) In diesem Raum kann gewohnt, gefeiert oder geschlafen werden.³³
 in this room can live-PPP celebrate-PPP or slept-PPP PASS.AUX-INF
 ‘In this room, it is possible to live, to celebrate or to sleep.’

In its permission reading, *können* has a meaning similar to *dürfen*, its possibility reading can be paraphrased in terms of temporal quantification, such as *From time to time, it happens that...* As soon as it involves no subject arguments on its own, *de dicto* readings become available, as it has been illustrated by Wurmbrand (1999, 606), Wurmbrand (2001, 192) and von Stechow (2003, 203). Such an interpretation obviously needs to come along with a corresponding intonation contour, in which the negative subject quantifier is set off by a small break and receives a high pitch accent. Likewise, Blühdorn (2012, Sec. 8.5/364) has pointed out that a narrow scope interpretation of the negation becomes more likely once it bears a high pitch accent (H*L).

- (56) Es kann (auch) | KEIN_{H*L} Student kommen.
 EXPL can (also) no student come-INF
 OK: de re, $\neg > MV$, ‘For no student_i it is allowed/possible that he_i comes.’
 OK: de dicto $MV > \neg$ ‘it is allowed/possible that no student comes’

De dicto readings with the deontic pattern *können* are also possible with existential quantifiers. In contrast to (56), such configuration can easily be attested in corpora. In example (57), the deontic possibility operator takes scope over the existential quantifier *ein Elternteil* ($\square > \exists$). The possibility to access the benefit is granted for one of the two parents and it is not specified whether it has to be the mother or the father.

- (57) Die staatliche Leistung wird maximal 14 Monate gezahlt. Ein Elternteil kann sie
 the public benefit is maximally 14 months paid a parent can she
 aber längstens ein Jahr in Anspruch nehmen. Die weiteren zwei Monate gibt es
 but at.most a year in claim take-INF the further two month gives it

³¹DeReKo: RHZ11/AUG.09341 Rhein-Zeitung, 09.08.2011.

³²DeReKo: R98/SEP.75404 Frankfurter Rundschau, 19.09.1998.

³³DeReKo: M10/APR.26150 Mannheimer Morgen, 06.04.2010.

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nur, wenn dann der Partner das Kind betreut.³⁴

only if then the partner the child cares

'The public benefit will be paid for maximally 14 month. A parent can draw down on it for no longer than a year. The remaining two month are only available, if the other partner takes care for the child during that period.'

Finally, the permission reading and the possibility reading are both transparent for voice. Both (58) and (59) turn out to be synonymous. In order to unambiguously trigger the respective reading, more plausible contexts have been chosen. However, as Reis (2001, 302) illustrates, the context of the discourse can have an impact on this diagnostic, which raises some doubt about the reliability of this test.

- (58) a. Der Reinhold kann_{perm} den Nanga Parbat ohne Sondergenehmigung
the Reinhold can the-ACC Nanga Parbat without special.permission
bezwingen.
conquer-INF
'Reinhold may conquer the Nanga Parbat without special permission.'
- b. Der Nanga Parbat kann_{perm} vom Reinhold ohne Sondergenehmigung
the-NOM Nanga Parbat can by.the Reinhold without special
bezwungen werden.
conquer-PPP PASS.AUX-INF
'The Nanga Parbat may be conquered by Reinhold without special permission.'
- (59) a. Der Kräuterpfarrer kann_{poss} die Leserbriefe auch schon mal
the herbs.priest can the-ACC letters.to.the.editor also PAR sometimes
persönlich beantworten.
personally answer-INF
'Sometimes, the herbal priest personally answers the letters to the editor.'
- b. Die Leserbriefe können_{poss} vom Kräuterpfarrer auch schon
the-NOM letters.to.the.editor can by.the herbs.priest also PAR
mal persönlich beantwortet werden.
sometimes personally answer-PPP PASS.AUX-INF
'Sometimes, the letters to the editor are answered by the herbal priest himself.'

All of these diagnostics illustrate that some of the circumstantial interpretations of *können* are indeed to be analysed as raising predicates. It seems to be possible that all of these different readings are derived from one general reading. This is supported by diachronic evidence. As Fritz (1997, 14) demonstrates, the permission reading developed out of practical possibility meaning. A similar position is put forth by Öhlschläger (1989, 156) who argues that permission reading is only secondary and is generated by a specific conversational background. As it appears, the last remaining reading can also be related to the practical possibility reading.

Carlson (1977, 119) and Brennan (1993, 97) discuss instances of the English modal *can* in which it quantifies over elements that are smaller than worlds. In particular, they focus on

³⁴DeReKo: M07/DEZ.04402 Mannheimer Morgen, 15.12.2007.

quantification over individuals (24) or situations. These readings can be equally found with its German counterpart *können* in (61) and (62):

- (60) A basketball player can be short.
- (61) Ein CSU-Politiker kann evangelisch sein.
a CSU.politician can protestant be-PRF.AUX.INF
'A CSU politician can be a protestant.'
- (62) Ein CSU-Politiker kann auch durchaus mal die Ehe gebrochen haben.
a CSU.politician can also sometimes once the marriage break-PPP have-INF
'There are some CSU-Politicians that have committed adultery.'
- (63) Ein derartiger Blutwert kann genetisch bedingt, aber auch auf Doping
a such blood.value can genetically determine-PPP but also on doping
mit EPO oder Eigenblut zurückzuführen sein – derartige Dopingfälle gab es
wiht EPO or own.blood to.backtrack-INF be-INF such doping.cases gave it
im Langlauf bereits zuhauf.³⁵
in cross.country already in.masses
'Such a blood parameter can be congenital but also due to doping with EPO or a autologous transfusion – in cross country, countless of such cases of doping have already occurred.'
- (64) Ein aktiv gemanagter Fonds kann aber durchaus besser abgeschnitten haben.
an actively managed fonds can yet definitely better perform-PPP have-INF
Sie federn extreme Bewegungen ab und haben vielleicht nur 15 bis 18 Prozent
they absorb extreme movements off and have may only 15 to 18 percent
verloren. Viele Fondsmanager haben seit Jahren gezeigt, dass ihre aktiv
lost many fonds.managers have since years shown that their actively
gemanagten Fonds besser laufen als passive.³⁶
managed fonds better run than passive
'A fond which is actively managed can have performed better. They absorb extreme price movements and they have possibly lost only 15–18 percent. Many managers of fonds have demonstrated throughout the last years that their actively managed fonds perform better than those that are managed passively.'
- (65) Drei ihrer Künstler hat die Galeristin bereits während ihres Studiums an der
three her-GEN artists-GEN has the gallery owner during their studies at the
Mainzer Kunsthochschule kennen gelernt. „Ein Künstler kann auch schon mit 30
Mainz Art.school know learnt a artist can also already with 30
einen Formenkanon gefunden haben, den er entwickeln will.”³⁷
a form.canon find-PPP have-INF that he develop-INF wants
'The gallery owner met three of her artists during their studies at the art school in Mainz:
"An Artist can have found his style already at the age of 30." '

³⁵DeReKo: NUZ06/OKT.02424 Nürnberger Zeitung, 25.10. 2006.

³⁶DeReKo: M08/SEP.70220 Mannheimer Morgen, 09.09. 2008.

³⁷DeReKo: RHZ07/APR.07409 Rhein-Zeitung, 10.04. 2007.

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- (66) Wer danach dieselben Türen berührt und dann ein Eis isst, kann sich schon
who after the.same doors touches and then a ice.cream eats can self already
angesteckt haben.³⁸
infect-PPP have-INF
'Some of those who touched the same doors and went to eat ice cream, have been infected.'

Essentially, the semantic contribution of *können* is that it existentially quantifies over the sort of individual denoted by the subject NP: there are at least some *CSU-politicians* for which the property encoded by the predicate holds. In contrast, the practical possibility readings discussed above seem to be the same phenomenon that Brennan (1993, 97) has in mind when she talks about quantification over situations. Some authors such as Portner (2009, 134) suggest a different classification according to which quantificational modals are a subtype of dynamic modality.

Summing up, there is actually no need to argue about the existence of circumstantial modal verbs with raising patterns. First of all, there is a lot of empirical evidence ranging from the selection of non-referential subjects, to the scope ambiguity of quantifiers and finally to the transparency with respect to voice. Moreover, it has been demonstrated that even the often quoted main proponents of the control versus raising approach, Jackendoff (1972, 105), von Stechow and Sternefeld (1988, 446) and Brennan (1993, 27) acknowledge that there are cases of circumstantial modals with underlying raising pattern. Furthermore, it has been shown that their approaches are never exhaustive and comprise of only one or two modals. Therefore, it should not be all too surprising if they draw very different conclusions about the nature of circumstantial modals.

Yet, it is not clear whether there are more circumstantial modals with control patterns apart from the obvious cases such as the ability reading of *können* and the volitional verbs *wollen*, *möchte* and *mögen*. As Feldman (1986, 179) discusses, deontic modality comprises at least two subtypes, whereas '*the ought-to-do involves a relation between an agent and a state of affairs. The ought-to-be involves a property of state of affairs*'. In a similar fashion, Barbiers (2002, 67), Abraham (2001, 18ff.), Abraham (2002, 36ff.) and Abraham (2005, 241, 257, 261) argue that deontic modals such as the permission reading of *können* are generally possible as control verbs. Brennan (1993, 45) applies a test similar to the voice transparency that is based on symmetric predicates. The result could be interpreted in favour of the existence of deontic control verbs. In a similar vein, Diewald (1999, 62) presents analogous examples of the voice transparency test. Reis (2001, 302), however, relativises the reliability of this diagnostic.

Raising directional phrases with event modification

As already observed by Paul (1898, 296 §221), the traditional six modal verbs including *lassen* 'let' and *helfen* 'help' systematically embed directional phrases in absence of a corresponding infinitive. He concludes that the lack of the infinitive cannot be explained in terms of an ellipsis as it has been proposed by authors such as Heyse (1822, 403). In a similar vein, Zifonun (1997, 1256), Erb (2001, 94), Vater (2004, 18), Szumlakowski-Morodo (2006), Hetland and Vater (2008, 102) and Ørsnes (2007) argue that the traditional six modal verbs in German also alternatively select directional PP or AP complements. This phenomenon is not restricted to

³⁸DeReKo: RHZ09/OKT.00336 Rhein-Zeitung, 01.10. 2009.

German but does also occur in other Germanic Languages such as Dutch (cf. Barbiers (1995, 2002), Riemsdijk (2002)), Danish (cf. Jespersen (1931, 238)), Norwegian (cf. Hetland and Vater (2008, 102)) and as it has been pointed out by Wilder (2008, 249) in a couple of Slavic languages such as Czech, Slovak, Slovenian, Serbian, Bulgarian and Russian. Furthermore, Denison (1993, 305) has demonstrated that these patterns were also available in earlier stages of English; Fritz (1997, 72) adduces evidence for the existence of them in Old and Middle High German.

Barbiers (1995, 151; 2002, 53) present a whole range of serious obstacles to be overcome for an ellipsis account for Dutch: (i) essentially, it is hard to account for patterns consisting of an inanimate subject + modal verb + directional phrase and (ii) it is not obvious as to why modal verbs with verbless directional phrases never can be interpreted epistemically. Szumlakowski-Morodo (2006, 327) presents an analogous example for German:

- (67) Der Brief muss zur Post (#gehen) / (#gebracht werden)
 The letter must to.the post.office go brought PAS.AUX
 'The letter must be taken to the post office'

Neither of the alternative is appropriate. The first case is problematic since *gehen* 'go' as it is used in (67) prototypically requires an animate subject. Nevertheless, it would be in principle possible to introduce this verb of movement but it would also subtly affect the semantic interpretation of the utterance. Barbiers (1995, 155) makes a similar observation for Dutch. Even if the second solution is more adequate from a semantic perspective, it is the more implausible from a syntactic one. First of all, it presupposes the ellipsis of the passive auxiliary, an assumption which lacks empirical justification since *werden* cannot be omitted in Contemporary German. Moreover, the AGENT argument in a passivised utterance can usually be expressed by a *von*-PP. However, this option is not available in (67), as it has been pointed out by Barbiers (1995, 152).

In analogy to Barbiers (1995, 153) and Barbiers (2002, 54), Vater (2004, 18) and Hetland and Vater (2008, 102) observe that modals with verbless directional phrases are restricted to a non-epistemic interpretation.

- (68) Hans muss ins Feld.
 Hans must into.the field PAS.AUX
 'Hans has to go into the field.' (deontic)
 '*Hans must go into the field.' (epistemic)

Finally, Szumlakowski-Morodo (2006, 342) discusses a third challenge for an ellipsis account. Whenever one of the traditional six modal verbs selects a verbless directional phrase, it will be realised as *ge*-participle rather than as IPP in perfect tense environments in Contemporary Standard German. In some southern varieties, however, the IPP is nevertheless available in these distributions.

- (69) ... dass er nachhause gemusst hat.
 that he home must-PPP(ge) PRF.AUX
 '... that he had to go home.'

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As it has been pointed out in Section 4.1.1, the *ge*-participle is ungrammatical as soon as the traditional six modal verbs embed an infinitive. Therefore, it is fairly likely that the use that selects a verbless directional phrase in (69) must be something else.

Since an account in terms of ellipsis turns out to be inadequate, an alternative explanation becomes necessary. Paul (1898, 296 §221) already explicitly suggested that directional phrases can be considered as predicates:³⁹

'[...]er ist weg, er ist nach Rom, die nicht anders aufzufassen sind als er ist in Rom, dh. weg und nach Rom sind als Prädikate zu nehmen ist als Kopula. Desgleichen er ist von Rom, woher ist er?.'

In a similar vein, Barbiers (1995, 162), Erb (2001, 95) and Barbiers (2002, 57) assume that the verbless directional phrases under discussion can be analysed as small clause complements; Ørsnes (2007) develops an analogous solution within LFG.

There are only a few attempts to develop an analysis that is based on the ellipsis of the infinitive. As already shown in Section 4.2.1, the modal verbs that lack infinitive complement crucially differ from canonical ellipsis. As pointed out by Ørsnes (2007, Section 3 & 4.2), the only solution would be to assume an entry of a specific empty verb in the lexicon. This is exactly the solution Riemsdijk (2002, 187) opts for. He argues that, in virtue of being functional categories, modal verbs in Germanic languages can licence the empty light verb *GO*. Wilder (2008) adapts this proposal and extends it to other languages and related phenomena. From the discussion above, it became clear that any account that assumes an empty verb faces a whole range of challenges. Some of them can be circumvented by means of a whole bunch of theory specific stipulations, but in the end Riemsdijk (2002, 166) concedes that his approach cannot explain why modal verbs with verbless directional phrases are always interpreted circumstantially. Moreover, he explicitly restricts his analysis to modal verbs uniquely, cf. Riemsdijk (2002, 144). In contrast, Öhlschläger (1989, 64) assumes that the verbless directional phrases are the result of an indefinite ellipsis, as suggested by Shopen (1973, 68). In Shopen's (1973) proposal, however, indefinite ellipsis includes cases in which the elided element cannot be recovered from the ongoing discourse, such as in *John received a package (from Canada)*. But Shopen (1973, 65) explicitly points out that indefinite ellipsis is a subtype of constituent ellipsis *where a predicate is expressed without all its arguments*. This phenomenon only concerns cases in which an entire argument is elided. Yet, this does not hold for modal verbs that occur with verbless directional phrases. Adopting the analysis suggested by Shopen (1973), it would be expected that the whole infinitival VP would be suppressed, including its head, the motion verb and the depending directional phrase. This actually underpins Öhlschläger's original claim. Finally, Behaghel (1924) does not become explicit as to whether he considers an account in terms of ellipsis an appropriate solution. In some passages, he seems to favour an ellipsis account (p. 369) in others he seems to adopt Paul's (1898) predicate analysis (p. 179).⁴⁰

³⁹[...] *er ist weg* 'he is away', *er ist nach Rom* 'he is to Rome', they have to be interpreted in the same manner like *er ist in Rom*, 'he is in Rome', accordingly *weg* 'away' and *nach Rom* 'to Rome' have to be considered as predicates *ist* 'is' as copula. in a similar fashion *er ist von Rom* 'he is from Rome', *woher ist er?* 'where is he (from)?' [translation J.M.]

⁴⁰Behaghel (1924, 179): *Es versteht sich, daß auch die Hilfszeitwörter behandelt werden, die infolge der Ersparung eines Bewegungsverbs selbst dessen Bedeutung erhalten haben.* ('It is clear that the auxiliaries will also be treated

Since Paul (1898, 296 §221) has already demonstrated that the selection of verbless directional phrases is not limited to the traditional modal verbs, any solution should also be applicable to the remaining verbs that come into consideration. However, a couple of them cannot be captured by an account in the spirit of Riemsdijk (2002). On the one hand, there are verbs like *helfen* ‘help’. From a semantic perspective, a predicate like the empty *GO* suggested by Riemsdijk (2002) seems to be roughly compatible with the directional phrase in (70). But for some strange reason, *helfen* loses its usual capability to alternatively combine with bare infinitive complements once it selects a directional phrase. In case the speaker wants to express a non-finite complement, the infinitival marker *zu* becomes obligatory. This is remarkable, since *helfen* usually alternatively selects bare infinitive and *zu*-infinitive complements, as it has been shown by Askedal (1989, 5). In order to maintain an ellipsis account, it would become necessary to additionally assume the existence of an empty infinitive marker *zu* or the existence of an empty *zu*-infinitive.

On the other hand, there are verbs such as *bekommen* ‘get’ and *kriegen* ‘get’ that occasionally select verbless directional phrases or verb particles in an analogous function, as is illustrated (71)–(74). In Standard German, it is not possible to insert any verb after the directional phrase. Some northern varieties allow for that option, but in that case the meaning will always be more specific in comparison to the variant without the verb of motion:

- (70) Ich helfe Dir auf den Baum (**zu** kommen) (**zu** #gehen)
 I help you-DAT on the table to come-INF to go-INF
 ‘I help you to climb the tree’
- (71) Neunzig Minuten lang bekam keiner den Ball ins Tor (*gegangen)/
 ninety minutes long got nobody the ball into goal go-PPP(ge)/
 (*gekommen).⁴¹
 come-PPP(ge)
 ‘During the ninety minutes, nobody managed to get the ball into the goal.’
- (72) Er kriegte ihn nicht hoch, aber liebte mich.⁴²
 he got him NEG up but loved me
 ‘He could not get it up, but he loved me.’
- (73) Alle kriegen ihren besten Freund hoch, nur nicht der bedauernswerte
 all get their best friend up only NEG the unfortunate
 Victor-Emmanuel Chandebise.⁴³
 Victor-Emmanuel Chandebise
 ‘Everybody could get it up but the unfortunate Victor-Emmanuel Chandebise could not.’

which have acquired the meaning of a predicate of motion due to the deletion of this predicate’ [translated by J.M.]

Behaghel (1924, 369): *Wenn die Ergänzung des Hilfszeitwort erspart wird, so kann das Partizip die Infinitivform beibehalten oder die echte Partizipform annehmen.* (If the complement of an auxiliary is deleted, the participle can keep its form as an infinitive or adopt the genuine form of a participle [translated by J.M.]

⁴¹DeReKo: RHZ05/OKT.11553 Rhein-Zeitung, 10.10. 2005

⁴²DeReKo: 97/SEP.22636 Zürcher Tagesanzeiger, 19.09. 1997; Allen Ginsbergs letzte Worte.

⁴³DeReKo: K00/JUL.55029 Kleine Zeitung, 23.07. 2000.

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- (74) Paul kriegt keinen Ton heraus, er hat längst keine Stimme mehr.⁴⁴
Paul gets no sound out he has long no voice anymore
'He lost his voice a long time ago so he could not make a sound.'

To conclude, in view of the evidence presented above, it is not plausible to assume that modal verbs that occur with verbless directional phrases involve the ellipsis of a predicate of motion. The most revealing fact is that these types of complements are restricted to modals with circumstantial and or dynamic interpretation only. This also holds at least for the remaining Germanic languages, as shown by Hetland and Vater (2008, 102) for Norwegian and Barbiers (1995, 2002) for Dutch. This is hard to account for with an analysis that assumes ellipsis.

Assuming that directional phrases can be interpreted as predicates, a solution can easily be obtained. According to the *rule for coherence* formulated by Bech (1955, 65), verbs that subcategorise bare infinitive complements or past participles obligatorily form a predicate complex (verbal cluster). Interestingly, almost all verbs of this class also alternatively select verbless directional phrases, vice versa some motion verbs occasionally take bare infinitive complements or in rare cases also past participles, as it has already been shown in Section 4.1.2:

- verbs selecting bare infinitives: *können*, *müssen*, *dürfen*, *sollen*, *mögen*, *brauchen*, *lassen* 'let', *würde gerne* 'would like to', *helfen* 'help', *trauen* 'dare', *haben* 'have', *sein* 'be', *tun* 'do'
- verbs selecting past participles: *gehören* 'belong/should.be', *bekommen* 'get', *kriegen* 'get', *sein* 'be', *haben* 'have'
- motion verbs selecting bare infinitives: *kommen* 'come', *gehen* 'go', *schicken* 'send', *senden* 'send'
- motion verbs selecting past participles: *kommen* 'come', *bringen* 'bring'⁴⁵

As it turns out, there are three types of predicates in German that always trigger predicate complex formation: those which select for bare infinitive, past participle or directional phrases. It is evident that each of them involves a particular semantic specification. Obviously, only bare infinitives fulfil the prerequisites for an epistemic interpretation. This is exactly what Reis (2001, 310) observes. Possibly, the crucial property of bare infinitives is to encode states. As

⁴⁴DeReKo: RHZ97/DEZ.00540 Rhein-Zeitung, 01.12. 1997.

⁴⁵Vogel (2005) intensively discusses the pattern *kommen* + past participle. However, this phenomenon does not seem to be restricted to *kommen*. In addition to the patterns discussed by Vogel (2005), verbs of caused movement such as *bringen* 'bring' are attested in analogous patterns.

- (i) Was bringst'n da wieder geschleppt, sag emal?
what bring.PART there again drag-PPP say once
'An' what' that you've got hold of now?'
Gerhart Hauptmann *Die Weber* V (1893).

At this point, I wish to thank Peter Sprengel who helped me with the translation from Silesian. A similar example is provided by Schoetensack (1856, 293).

Barbiers (2002, 59) illustrates, verbless directional phrases always denote a polarity transition and correspond rather to perfective or eventive predicates. Of course, as already shown by Bech (1955, 84), there are also verbs that select *zu*-infinitive complements and nevertheless obligatorily form a predicate complex such as *brauchen* or *pflügen* 'be wont to do sg.' Moreover, Ørsnes (2007, Fn. 23) points out that there is also a small group of object control verbs that alternate between *zu*-infinitive complements and verbless directional phrases, such as *bitten*, *wünschen* and *schaffen*. Since an exact description of the relation between the small group of *zu*-infinitives and verbless directional phrases goes beyond the goals of the present investigation, it will be the task of some future enterprise to precisely examine the interdependence between the two classes of predicates.

When adopting a Small Clause or a predicate analysis, one more problem remains to be tackled. Verbs that embed a bare infinitive complement can be either classified as control verbs or raising verbs depending on whether or not they involve a subject argument on their own. Assuming that directional phrases are predicates, this issue needs also to be addressed here. Since directional predicates do usually not combine with non-referential subjects, one major diagnostic for raising cannot be applied here. Although it seemed to be possible in earlier stages of German, as will be shown in Section 4.2.6. It might be revealing to verify to which extent inanimate subjects are possible with directional predicates. In the case of *können* with possibility reading, this type of subject appears to be acceptable. It is not plausible to assume that the possibility is ascribed to the sun in (76), resulting in some kind of ability reading. Rather, the possibility operator takes scope over the whole predication.

In all examples of *können* with verbless directional phrases provided so far by Vater (2004), Hetland and Vater (2008), Szumlakowski-Morodo (2006), Ørsnes (2007) and Erb (2001, 96), it denotes a possibility or a permission. Since the two corresponding counterparts of *können* with bare infinitive complements involve raising rather than control, it is fairly likely that this is also the case in the examples (75) to (77).

As illustrated in (78), there are some rare instances of *können* with a verbless directional phrase in which an ability interpretation is most plausible. As shown in Section 4.2.1, this in turn requires the presence of a subject argument which is an indicator for control.

- (75) Waffen zu Hause müssten stärker kontrolliert werden, aber die Polizei kann nicht
 arms at home must stronger controlled be but the police can NEG
 ohne Weiteres in die Wohnungen hinein.⁴⁶
 with.out further into the apartment in
 'More strict controls should be in place concerning the possession of fire arms in the house
 the police are not allowed to enter without further permission.'
- (76) Die Sonnenwärme kann hinein, aber nicht wieder heraus.⁴⁷
 the sun.heat can in but NEG again out
 'The heat from the sun can get in but it cannot get out.'

⁴⁶DeReKo: BRZ09/MAI.05378 Braunschweiger Zeitung, 12.05. 2009.

⁴⁷DeReKo: RHZ09/FEB.09586 Rhein-Zeitung, 11.02. 2009.

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(77) Es sollte gewährleistet sein, dass sie jederzeit in Haus oder Wohnung hinein
it should warranted be that they always in house or apartment in
können.⁴⁸

can

‘It should be ensured that cats can get into the house or apartment anytime.’

(78) Ich kann schon alleine auf’s Katzenklo und erkunde gerade die große weite
I can already alone at.the cat.litter.pan and explore currently the great wide
Welt.⁴⁹

world.

‘As a kitten, I can already find the cat litter tray on my own and currently I am about to start exploring the big wide world.’

This section demonstrated that verbless directional phrases that occur with the six traditional modal verbs are no result of an ellipsis of a motion verb. Rather, they have to be considered as predicates or Small Clauses. As it appears, these patterns can in principle involve both raising or control. The reason as to why Barbiers (1995, 162) argues that directional phrases always induce raising is inherent to the Government & Binding theory and not mandatory for any other type of theory.

Raising infinitives with propositional modification

In contrast, epistemic modifiers drastically differ with respect to these points. First of all, they do not encode statements about the actual world but rather express assumptions about possible worlds. Secondly, they do not indicate that the speaker has knowledge of factive realisations of the predication. A sentence like *the lake could be cold* can even be uttered if the speaker does not know whether there was a single moment when the lake was indeed cold. Finally, a proposition in the scope of an epistemic modal operator can never be part of the speaker’s knowledge. Similar observations have already been made by Westmoreland (1998, 12), Diewald (1999, 209, 225) Ziegeler (2006, 90), Fintel and Gillies (2010, 353), Kratzer (2011) and Martin (2011), furthermore by Zimmermann (2004, 256) focussing on the German discourse particles *wohl*.

This section is devoted to the epistemic interpretation of *können*. The nature of epistemic modifiers is that they are evaluated with respect to the knowledge of the speaker (deictic centre). Adopting the position developed by Westmoreland (1998, 12) and Ziegeler (2006, 90), the employment of an epistemic modifier presupposes that the speaker (deictic centre) does not know whether the epistemically modified proposition holds or not. For the sake of simplicity, this condition was labelled *Condition on Deictic Centres* (CoDeC) in Section 4.1.3. Accordingly, this section will only deal with instances of what Lyons (1977, 797ff.) defines as ‘subjective’ epistemicity. As will be shown in Section 6.22, all the examples for objective epistemicity discussed so far can be entirely considered either as subtypes of circumstantial modality such as

⁴⁸DeReKo: BRZ09/JAN.03341 Braunschweiger Zeitung, 09.01. 2009; Was Hunde- und Katzenbesitzer zurzeit beachten sollten.

⁴⁹<http://www.neue-mitmach-zeitung.de/osthaudefehn/lokales/katzenfindelkinder-in-osthaudefehn-wer-hat-ein-herz-d931.html>, 28.01. 2010.

practical necessity or practical possibility or as ('subjective') epistemic modality. Some authors, such as Palmer (1986, 53), have a wider definition of epistemic modality which encompasses Judgements (Speculative, Deductive) and Evidentials (Reportative, Based on senses). The term epistemicity as it is used here only comprises Palmer's (1986) first subtype: Judgements.

According to the CoDeC, a speaker (deictic centre) which employs an epistemic modal verb signals that the epistemically modified proposition is not part of his knowledge. So whenever a speaker knows that the proposition under discussion is true, the modal verb employed cannot be an epistemic one. In this section, it will be tested as to which extent propositions in the scope of an epistemic modal verb may be part of the speaker's knowledge.

Epistemic modal verbs can be characterised in terms of two types of environments: (i) environments in which they are possible and their non-epistemic counterparts are excluded and (ii) environments in which they are excluded and their non-epistemic counterparts are possible. As it will be illustrated in more detail in Section 5, circumstantial modal verbs with referential subjects fail to embed predications that include an identified individual and a predicate that refers to an event in the past or a predicate that denotes permanent states that cannot be changed. Epistemic modal verbs crucially differ in that respect. They are even highly frequent in such environments, as it is illustrated in example (79) and (80), similar observations have been made by Barbiers (1995, 148) and Barbiers (2002, 59). Likewise, Bech (1949, 43) already wonders why modal verbs with infinitive perfect complements target the "reality" of the embedded predication rather than its "realisation".

- (79) RUPRECHT: [...] Es kann ein dritter wohl gewesen sein.⁵⁰
 it can a third perhaps be-PPP INF

RUPRECHT: 'Perhaps, it could have been a third person.'

- (80) Nach Zeugenangaben könnte ein etwa 30 Jahre alter Mann der Täter
 after witness.reports can-SBJV.PST a about 30 year old man the culprit
 sein.⁵¹
 be-INF

'According to reports by a witness, the culprit could be a man that is about 30 years old.'

Crucially, in both examples the proposition in the scope of the epistemic modal verb cannot be part of the speaker's knowledge. Neither does *Ruprecht* know who has broken the jug at the moment of his utterance nor does the author of the other sentence know that the about 30 year old man is the culprit. This is an essential contrast to practical possibility modal verbs and quantificational modal verbs that are in principle compatible with utterance situations in which the speaker can know that the embedded predication holds, as will be demonstrated in more detail in Section 5.

The second way to characterise epistemic modal verbs is in terms of the environments in which they are excluded, but their circumstantial counterparts fully acceptable. In the past decades, more than twenty of these distributions have been suggested. Based on large data samples exploited from the DeReKo corpus, it will be demonstrated in great detail in Section 6

⁵⁰Heinrich von Kleist *Der Zebrochene Krug*, 9. Entry (1806).

⁵¹DeReKo: RHZ08/JUN.01622 Rhein-Zeitung, 03.06. 2008.

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that a couple of them are only empirically justified: Epistemic modal verbs in German do not occur with verbless directional phrase complements, they cannot be separated from their infinitive complements in *wh*-clefts, they do not undergo nominalisations, they are exempt from adverbial infinitives, and finally, they cannot occur embedded under another modal operator. These results are reminiscent of the conclusion that Eide (2005, 9) draws for Norwegian.

It merits closer attention that epistemic *können* comes across in two different guises: as *kann* with an indicative inflection and *könnte* with a subjunctive past inflection. As it turns out, the two alternatives cannot be mutually replaced but they differ with respect to some semantic subtleties. The main question that arises at this point is what is the semantic effect of subjunctive morphology on epistemic modal verbs. As it has been observed by Lötscher (1991, 347), epistemic modal verbs that occur in the scope of a subjunctive past marker behave in an unexpected manner. Based on the assumption that the subjunctive of the past in German indicates the counter-factuality of the modified proposition in non-embedded environments, one would expect that an epistemic possibility in the scope of a subjunctive past operator would be interpreted as counter-factual epistemic possibility. However, this is clearly not the case in examples like (80): the speaker does not want to express that the epistemic possibility that the culprit is the 30 year old man is banned from the actual world. In more detail, Lötscher (1991, 347) argues that *kann* and *könnte* can be mutually replaced without causing any semantic effect. A similar observation has been made by Coates (1983, 239), who argues that the subjunctive mood in English, leaves epistemic modals by and large unaffected.

In contrast, Fritz (1997, 101) observes that subjunctive morphology has an impact on the degree of certainty that is expressed by the epistemic modal verbs *können* and *müssen*. As he argues, the degree of certainty of these epistemic modal verbs decreases as soon as a subjunctive of the past morpheme is attached.

Reviewing corpus examples for epistemic instances of *könnte*, it turns out that Lötscher's assessment was wrong: the verbs *kann* and *könnte* cannot always mutually be replaced. First of all, a substitution of *könnte* by its indicative counterpart *can* yields a decreased degree of acceptability in most contexts, as the contrasts in (81)–(82) indicate:

- (81) a. Sollte diese Einschätzung zutreffen, dann könnte Iran bereits vor
should this assessment hold than can-SBJV.PST Iran already before
acht Wochen mit der Herstellung einer Atombombe begonnen haben.⁵²
eight weeks with the production a-GEN nuclear.bomb begin-PPP have-INF
'If this assessment turns out to be correct, then Iran could have already started to produce
a nuclear bomb eight weeks ago.'
- b. # Sollte diese Einschätzung zutreffen, dann kann Iran bereits vor acht
should this assessment hold than can- Iran already before eight
Wochen mit der Herstellung einer Atombombe begonnen haben.
weeks with the production a-GEN nuclear.bomb begin-PPP have-INF
Intended: 'If this assessment turns out to be correct, then Iran could already have started
to produce a nuclear bomb eight weeks ago.'

⁵²DeReKo: A09/FEB.06422 St. Galler Tagblatt, 23.02. 2009.

- (82) a. Das Mädchen hatte im Garten gespielt und plötzlich Blut gespuckt. Die
 the girl had in.the garden played an suddenly blood spewed the
 Angst der Mutter: Das Kleinkind könnte Glas verschluckt
 fear the-GEN mother the toddler can-SBJV.PST glass swallow-PPP
 haben.⁵³
 have-INF
 ‘The girl was playing in the garden und suddenly she started spewing blood. The mother
 was afraid the toddler could have swallowed glass.’
- b. # Das Mädchen hatte im Garten gespielt und plötzlich Blut gespuckt. Die
 the girl had in.the garden played an suddenly blood spewed the
 Angst der Mutter: Das Kleinkind kann Glas verschluckt haben.
 fear the-GEN mother the toddler can glass swallow-PPP have-INF
 Intended: ‘The girl was playing in the garden und suddenly she started spewing blood.
 The mother was afraid the toddler could have swallowed glass.’

Though the examples with *kann* in (82b) and (81b) are not completely ungrammatical, they represent a pretty unnatural choice. Obviously, *kann* requires a very specific context, which is not given here. It generally seems that epistemic *könnte* is much more flexible with respect to the distributions in which it may occur. In contrast, the use of epistemic *kann* turns out to be fairly restricted.

Nevertheless, there are environments in which epistemic *kann* cannot be substituted by its subjunctive past counterpart *könnte*. This concerns above all environments in which epistemic *kann* occurs in the scope of a negation, as it is illustrated in (83) and (84):

- (83) a. An mangelndem Training kann es am Montag nicht gelegen haben.⁵⁴
 on lacking training can it on Monday NEG lie-PPP have-INF
 ‘The lack of training cannot have been the cause on Monday.’
- b. # An mangelndem Training könnte es am Montag nicht gelegen haben.
 on lacking training can it on Monday NEG lie-PPP have-INF
 Intended ‘The lack of training cannot have been the cause on Monday.’
- (84) a. Die Tat kann ich nicht begangen haben, zum beschriebenen Zeitpunkt
 the crime can I NEG commit-PPP have-INF at.the given moment
 saß ich schon einen Tag ein.⁵⁵
 sat I already a day in
 ‘I cannot have committed the crime as I was already in jail at that given moment.’
- b. # Die Tat könnte ich nicht begangen haben, zum beschriebenen
 the crime can-SBJV.PST I NEG commit-PPP have-INF at.the given
 Zeitpunkt saß ich schon einen Tag ein.
 moment sat I already a day in

⁵³DeReKo: BRZ09/AUG.03524 Braunschweiger Zeitung, 08.08. 2009.

⁵⁴DeReKo: HMP09/AUG.01455 Hamburger Morgenpost, 15.08. 2009.

⁵⁵DeReKo: RHZ09/NOV.18511 Rhein-Zeitung, 20.11. 2009.

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Intended: 'I cannot have committed the crime as I was already in jail at that given moment.'

The only interpretation that is available in the examples (83b) and (84b) is the one in which the negation is in the scope of the modal verb yielding readings such as *It could be the case that the lack of the training was not the cause* and *It could be that I have not committed the crime*. But these readings are not plausible in the given context.

As the data indicates, there is a subtle but solid difference between the epistemic interpretations of the indicative *kann* and the subjunctive past *könnte*. But how can this distinction be captured? At least two different types of epistemic *könnte* have to be considered. The example (81a) that involves a conditional appears to be a very revealing case. In this particular instance, the speaker indicates that his evidence involves a premise that is not verified. In this conditional construction the non-verified premise is explicitly realised as the antecedent: *Sollte diese Einschätzung zutreffen* ('If this assessment is correct'). As the conditional in this example is an epistemic conditional (cf. Section 5.4.1), the consequent of this expresses a proposition that is not part of the speaker's knowledge, an epistemically modified proposition. The role of the epistemic modal verb in this context appears to be redundant at first glance. But under closer inspection, it turns out that it obviously specifies the degree of certainty of this assumption.

Given these observations, there are some reasons to assume that there is one type of epistemic *könnte* that refers to a conclusion that is based on evidence that involves non-verified premises. According to Kasper (1987, 24ff.), subjunctive of the past indicates that the modified proposition cannot be felicitously asserted. In the canonical case, the proposition is interpreted as counterfactual. As it has been shown by Lötscher (1991, 339ff.), a subjunctive past operator that takes scope over a modal operator does not express the counter-factuality of the modal operator as it would be expected, rather it results in a factual interpretation. Maintaining Kasper's view, one could assume that a speaker that uses an epistemic modal verb in the scope of a subjunctive operator intends to communicate that he is not in the position to felicitously utter the epistemic modal verb in indicative mood. So a speaker that utters *könnte(p)* signals that for some reason he is not in the position to felicitously employ *kann(p)*. As it becomes clear, in most examples, it is not the epistemic possibility that is counterfactual, as has already been remarked by Lötscher (1991, 347). It is plausible to assume, then, that the cause for the speaker's reservation has to do with the quality of the evidence on which the epistemic conclusion is based. In other words, the subjunctive morpheme on the epistemic modal verb indicates that the evidence contains premises that are not verified.

Furthermore, this account could provide an explanation as to why epistemic *könnte* is hardly acceptable in the scope of a negation whereas epistemic *kann* is. Employing the indicative epistemic modal verb *kann*, the speaker indicates that his assumption is based on premises that are verified facts. Uttering $\neg\Diamond(p)$, he points out that this set of facts contains a premise q that contradicts p . Accordingly, the main reason to utter such a pattern is to categorically refute the proposition p . The validity of a proposition can only be challenged, if the objections are based on established facts, rather than on non-verified premises. Being based on non-verified premises, *könnte* appears to be less suitable for such a purpose.

As the example (81a) given above involves three different types of modifiers (subjunctive past operator, epistemic conditional operator, epistemic modal operator), the precise interaction of

these yet remains to be investigated in further detail. However, the analysis sketched here would account for the observation made by Fritz (1997, 101) and Mortelmans (2000, 205) who notice that subjunctive morphology decreases the degree of certainty expressed by an epistemic modal verb. Moreover, it is supported by other recurrent instances of epistemic *könnte*, such as the examples (85)–(87).

- (85) Dieses Mal geht es um fehlende Geldbeträge aus der Klassenkassa. Schnell
 this time goes it about missing money.amounts out the class.cash.box quickly
 ergibt sich der Verdacht, dass Heinz Schimmel, ein Mitschüler, der Täter sein
 result REFL the suspicion that Heinz Schimmel a classmate the culprit be-INF
 könnte.⁵⁶
 can-SBJV-PST
 ‘This time, it is about amounts of money that are missing in the cash box of the class. Quickly, the suspicion arose that Heinz Schimmel, a classmate, could be the culprit.’
- (86) Das Blut, das er dabei vergoß, könnte für die Gendarmerie eine heiße Spur
 the blood that he thereby spilled could for the police a hot trace
 sein, denn nun besitzt sie einen genetischen „Fingerabdruck“ des
 be-INF as now possesses she a genetic fingerprint the-GEN
 Einbrechers.⁵⁷
 burglar-GEN
 ‘The blood that he spilled in doing so could be a fruitful hint for the police, as they now have a genetic fingerprint of the burglar.’
- (87) Laut Polizei könnte der Junge der bisher unbekannte Täter sein,
 according police can-SBJV.PST the boy the hitherto unknown culprit be-INF
 der am Montag oder Dienstag in ein Wohnhaus im Küferweg
 that on Monday or Tuesday into a residential.building at.the Küferweg
 eingebrochen war.⁵⁸
 in.break-PPP was
 ‘According to the police, the boy could be the hitherto unknown culprit that on Monday or Tuesday broke into the residential building at Küferweg.’

Once again, in all these contexts epistemic *kann* is very unnatural. An interesting case is the example (87). As it has been observed by Stephenson (2007, 490), some adverbials can be used to identify the deictic centre. Following this observation, the utterance in (87) is ambiguous. In the first interpretation, the adverbial *laut Polizei* (‘according to the police’) serves as deictic centre. Correspondingly, the assumption expressed by the epistemic modal verb *könnte* is attributed to the referent contributed by the adverbial which is the police. In the second interpretation, the epistemic conclusion is attributed to the speaker who indicates that he is not in the position to felicitously use the epistemic modal verb *kann* in this environment. The most plausible reason is that his conclusion would be based on premises that are non-verified. In the example above,

⁵⁶DeReKo: NON09/NOV.13407 Niederösterreichische Nachrichten, 23.11. 2009.

⁵⁷DeReKo: V99/JAN.03151 Vorarlberger Nachrichten, 21.01. 1999.

⁵⁸DeReKo: RHZ07/JUL.04745 Rhein-Zeitung, 05.07. 2007.

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this premises could be referred to by the adverbial *laut der Polizei* which would be interpreted as *if the police are right*.

In some cases, the speaker may even draw his conclusion based on premises that he considers as counter-factual or false, as is illustrated in example (88). A similar example of epistemic *könnte* is discussed by Mortelmans (2000, 208).

- (88) Da schreibt Frau Scherfenberg gleich zu Anfang: Darwin habe „den Glauben an den allmächtigen Schöpfergott der Bibel zerschmettert“. Wenn das so wäre bzw. gewesen wäre, dann könnte es doch wohl nicht sein, dass die christlichen Kirchen eben diesen Glauben an Gott den Schöpfer nach wie vor – auch 150 Jahre nach Darwins Werk – jeden Sonntag öffentlich bekennen – und zwar die Katholiken, die Protestanten und die Orthodoxen in gleicher Weise, von den Muslimen u.a. ganz zu schweigen.⁵⁹
- there writes Mrs Scherfenberg already at beginning Darwin have-SBJV.PRS the faith in the almighty creator.deity the-GEN Bible shattered if this so be-SBJV.PST or be-PPP be-SBJV.PST then can-SBJV.PST it PAR maybe NEG be-INF that the Christian church precisely this faith in God the Creator after as before also 150 years after Darwin-GEN work every Sunday openly avow and PAR the Catholics, the Protestants and the Orthodox in same manner about the Muslims etc completely to be.silent-INF

‘Mrs. Scherfenberg already claims at the outset that Darwin has shattered the faith in the almighty Lord of Creation. If this were indeed the case, then it could not be the case that Christian churches this belief still openly avow on every Sunday encompassing the Catholics, the Protestants and the Orthodoxes, not to mention the Muslims.’

This example is remarkable for another particular circumstance: the epistemic instance of *könnte* occurs in the scope of a negation. As it has been shown above, this behaviour is rather atypical for epistemic *könnte* but very typical for epistemic *kann*. This leads us to the conclusion that the example above involves an instance of *könnte* that can be compositionally built from epistemic *kann* and the subjunctive past morpheme. In Section 6.4, further examples will be provided. This is further confirmed by the fact, that it can be replaced by its indicative cognate, together with the copula *wäre* in the conditional clause which is also inflected for past subjunctive. This indicates that the use of *könnte* in example (88) is different from the one in the examples discussed.

At this point, it is necessary to distinguish between two uses of epistemic *könnte*: one which is based on evidence that contains non-verified premises and a second one which is based on premises that are false. Whereas the latter type can be accounted for in terms of a compositional interaction between the epistemic operator and the subjunctive past operator, the precise status of the first type is less clear. One option is to assume that the subjunctive operator affects the validity of the premises on which the epistemic conclusion is based. Yet, it remains to be

⁵⁹DeReKo: NUN09/FEB.01667 Nürnberger Nachrichten, 14.02. 2009.

shown how these elements interact in more detail. Otherwise, epistemic *könnte* would have to be analysed as non-compositional epistemic modal operator. As pointed out by Fritz (1997, 102), such a scenario is rather likely.

There are at least two methods that could reveal the true nature of this *non-verified premise* interpretation of *könnte* and that could illustrate as to which extent it can be compositionally captured. Firstly, there are two ways of how the subjunctive of the past can be morphologically realised, as is illustrated by Zifonun (1997, 1736): either in a synthetic or in a periphrastic manner. In the case of *können*, the synthetic variant is *könnte* and the analytic variant involves the subjunctive past auxiliary *würden* and the infinitive *können*. If the *non-verified premise* reading is a result of semantic composition, it is expected that it should also be available in the analytic alternative. As it turns out, such instances of the periphrastic variant that come into consideration for an epistemic interpretation occur fairly rarely in the DeReKO corpus.

- (89) Im Programm der Stadt ist schon längst die Sanierung des
 in.the program the-GEN city is already long the renovation the-GEN
 Marktplatzes vorgesehen. Hier könnte man statt dem jetzigen
 marked.place-GEN planned here can-SBJV.PST one instead the current
 Geröll, als flaches Denkmal eine Pflasterung mit farbigem Steinmosaik in Form
 boulders as flat memorial a paving with coloured stone.mosaic in shape
 der Karte Europas gestalten. Politisch würde wohl niemand
 the-GEN map Europe-GEN arrange politically SBJV.PST.AUX maybe nobody
 dagegen sein können.⁶⁰
 against be-INF can-INF

‘The renovation of the marked place has been already long ago considered in the program of the city. Here one could see a flat paving made out of a coloured stone mosaic in the shape of Europe. In political respect, nobody could disagree.’

It merits closer attention that the only occurrence in the DeReKo corpus is in the scope of a negation, therefore it could not be replaced by its synthetic counterpart *könnte*. This indicates that example in (89) meets all the criteria that are typical for epistemic *kann*. Thus, the only interpretation that is applicable to this pattern is the *counter-factual premise* interpretation which refers to a counterfactual epistemic possibility. The *non-verified premise* reading does not apply. In a similar manner, Mortelmans et al. (2009, 34) have illustrated that the analytic pattern cannot construe the *non-verified premise* for *können* in German. In contrast, they demonstrate that in Dutch such an interpretation is available. The analytic pattern *zou + kunnen* can yield a *non-verified premise* interpretation.

The second way to determine the precise status of the *non-verified premise* interpretation with respect to compositionality is another replacement test that involves semantically related expressions, such as epistemic adjectives *möglich* ‘possible’ and *notwendig* ‘necessary’. If the *non-verified premise* reading is a result of semantic composition, it is expected that it should also be available with epistemic adjectives that are selected by a copula with subjunctive past morphology, patterns such as *es wäre möglich, dass* ‘it is-SBJV.PST possible that’ and *es wäre*

⁶⁰DeReKo: I97/SEP.37816 Tiroler Tageszeitung, 27.09. 1997.

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notwendig, dass ‘it is-SBJV.PST necessary that’. But if the epistemic modal verb *könnte* in example (85) is substituted by an epistemic adjective, the meaning of the whole utterance will be affected, cf. (90).

- (90) Schnell ergibt sich der Verdacht, dass es möglich wäre, dass Heinz
quickly result REFL the suspicion that it possible be-SBJV-PST that Heinz
Schimmel, ein Mitschüler, der Täter ist.
Schimmel a classmate the culprit is
‘Quickly, the suspicion arose that Heinz Schimmel, a classmate, could be the culprit (under some circumstances).’

Once again, the interpretation in which the epistemic possibility is counterfactual is the preferred one. It is hard to decide whether the *non-verified premise* interpretation is possible at all in such an environment. The past subjunctive of the copula appears to indicate that the possibility is not actual under the given circumstances. These results from the two replacement tests strongly suggest that the *non-verified premise* interpretation is not compositional or it at least involves a very different mechanism.

Unlike epistemic modal verbs that are inflected for indicative, their subjunctive of the past counterparts can embed propositions that are known to be false.

- (91) Nach all dem was ich weiß, könnte das der Schlüssel zu Zhannas
according all that what I know can-SBJV.PST this the key to Zhanna-GEN
Büro sein. Er ist es aber nicht.
office be-INF he is it but NEG
‘According to what I know, this could be the key to Zhanna’s office. But it isn’t.’

Examples like (91) describe a conflict between the evidence drawn from the knowledge and the external evidence provided by the utterance situation. A similar observation has been made by Copley (2006, 5) for the English modal auxiliary *should*. If *könnte* is replaced by its indicative cognate *kann*, the acceptability significantly decreases. It remains to be checked whether this phenomenon applies to *könnte* to the same extent in its *non-verified premise* interpretation and its *counterfactual premise* interpretation.

As already indicated at the outset of this section, the most efficient definitions of epistemic modality impose restrictions on the speaker’s (deictic centre’s) knowledge. The accounts reviewed so far differ with respect to the precise formulation of these restrictions. Some accounts assume that the usage of an epistemic modal operator presupposes that the speaker does neither know whether the proposition is true or false. As a consequence neither p nor $\neg p$ should be part of the speaker’s knowledge. In contrast, Martin (2011, Sect. 3.1) argues that a speaker that uses an epistemic modal operator cannot know that the proposition is false, thus the proposition $\neg p$ must not be part of the speaker’s knowledge. Both analyses cannot neatly account for the example given above (91) without any further stipulation. The analysis developed here is based on the assumption that the proposition in the scope of the epistemic modal operator must not be part of the speaker’s knowledge (CoDeC). Under such a perspective, the example given above can be accounted for, as the knowledge of the speaker only comprises the proposition $\neg(\textit{this is the key to Zhannas office})$ but not the proposition *this is the key to Zhannas office*.

As it seems, one major difference between epistemic *kann* and *könnte* concerns the way they qualify their underlying evidence. Whereas the former type indicates that the underlying evidence is entirely made up out of facts, the latter signals that some of the premises are not verified. Yet, there are some open questions. Firstly of all, it is not clear why epistemic *kann* occurs so rarely. Unlike the other epistemic modal verbs in German, it occurs more often in the scope of a negation and in questions, which are rather atypical environments. This has lead authors such as Öhlschläger (1989, 208) to the conclusion that these instances of *kann* do not involve genuine epistemic modality, but rather ‘objective’ epistemic modality, which is considered as a less grammaticalised type. At this point, it is not evident whether *können* involves a true independent epistemic reading at all. As for its English counterpart *can*, it has been shown at various occasions that it lacks such a reading, as is illustrated by Hofmann (1976, 94), Coates (1983, 85), Sweetser (1990, 62), Brennan (1993, 14) and Drubig (2001, 43) for instance. Further details are discussed in Section 5.3.

It is no trivial matter to decide how to distinguish between an epistemic possibility interpretation, a practical possibility interpretation and a quantificational reading, as their communicative effect can be the same. Yet, the possibility modal verb *kann* differs from its English counterpart *can* in two essential respects: (i) it embeds predications that involve an identified individual and a predicate that refers to a permanent state or that refers to the past, (ii) in these environments the embedded proposition is not part of the speaker’s knowledge, as the examples below indicate. Both properties are characteristic for genuine epistemic modal operators. Furthermore, it will be demonstrated in Chapter 6 that the assumption of an ‘objective’ epistemic modality is misleading, therefore refuting Öhlschlägers objections.

There are a couple of distributions in which it becomes far more likely that *können* is epistemically interpreted. As Doitchinov (2001, 119) argues, the pattern *es kann sein, daß* ‘it could be that’ forces an epistemic interpretation (92)–(95). Furthermore, modal verbs are preferably epistemically interpreted whenever they select individual level predicates (96) to (97) and complements with past reference (99) to (100), a detailed discussion about these diagnostics will be given in Chapter 5.

- (92) Es kann sein, dass die Zisterne so um 330 nach Christus hier angelegt
it can be that the cistern PAR about 330 after Christ here built
worden ist.⁶¹
PAS.AUX-PPP is
‘It is possible that the cistern was built here about 330 years after Christ.’
- (93) Es kann sein, dass zwischen dem Teamchef und Ivanschitz etwas vorgefallen
it can be that between the team.leader and Ivanschitz something happened
ist.⁶²
is
‘It is possible that something happened between the team leader and Ivanschitz.’
- (94) Es kann sein, dass mich die neue Frisur ein wenig schneller und besser gemacht
it can be that me the new haircut a little faster and better made

⁶¹DeReKo: RHZ08/JUL.05907 Rhein-Zeitung, 04.07. 2008.

⁶²DeReKo: NON09/NOV.05778 Niederösterreichische Nachrichten, 10.11. 2009.

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- hat [...] ⁶³
has
'It is possible that my new haircut enabled me to be faster and better ...'
- (95) Es kann sein, dass Ardi ein direkter Vorfahr ist. ⁶⁴
it can be that Ardi a direct ancestor is
'It is possible that Ardi is a direct ancestor.'
- (96) Vieles spricht dafür, dass der festgenommene Mann der Täter sein kann. ⁶⁵
much speaks in.favour that the arrested man the culprit be can
'There are many factors in favour of the assumption that the arrested man could be the culprit.'
- (97) Diese traditionelle Schilderung kann allerdings auch falsch sein. ⁶⁶
this traditional description can however also false be
'However, this traditional description could also be false.'
- (98) So kann die Motte in Wipshausen einmal ausgesehen haben. ⁶⁷
so can the Motte in Wipshausen once out.look-INF have-INF
'The Motte in Wipshausen could have looked like this once upon the time.'
- (99) Ich kenne den Täter nicht, er kann die Taten auch begangen haben, um
I know the culprit NEG he can the acts also committed have in.order.to
Macht und Kontrolle auszuüben. ⁶⁸
power and control exert-INF
'I am not sure, but the culprit may have also committed the acts in order to exert power and control.'
- (100) Es kann auch ein zusätzlicher Einsatz-Alarm das Signal überlagert haben. ⁶⁹
it can also a additional mission.alarm the signal interfere have
'There could have been an an additional alarm that interfered with the signal.'

Note that in none of the examples the speaker could resume the discourse by stating ... *and I know that is the case*. Doitchinov (2001) is not quite right in his claim that *es kann sein, daß* needs to be obligatorily interpreted in an epistemic way since there are rare cases in which the speaker could in principle know whether the proposition holds or not:

- (101) Die Zahnradstrecke mit bis zu 90 Promille Gefälle verbindet mitunter zwei
the cog.railroad with up to 90 per.mill slope connects occasionally two
völlig unterschiedliche Klimazonen: Es kann sein, dass in Heiden tiefster
completely different climates: it can be that in Heiden deepest

⁶³DeReKo: HAZ09/DEZ.03174 Hannoversche Allgemeine, 21.12. 2009.

⁶⁴DeReKo: NUZ09/OKT.00590 Nürnberger Zeitung, 08.10. 2009.

⁶⁵DeReKo: RHZ08/FEB.11333 Rhein-Zeitung, 13.02. 2008.

⁶⁶DeReKo: WPD/AAA.01884 Leipnizkeks, Wikipedia, 2005.

⁶⁷DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11.08. 2009.

⁶⁸DeReKo: HAZ09/FEB.00785 Hannoversche Allgemeine, 05.02. 2009.

⁶⁹DeReKo: NON09/DEZ.05190 Niederösterreichische Nachrichten, 08.12. 2009.

Winter ist, am See unten jedoch alles grün. Oder umgekehrt: In winter is at the lake down however everything green Or vice versa in Rorschach herrscht neblige Kälte, in Heiden dagegen warmes, sonniges Wetter⁷⁰ Rorschach reigns foggy cold in Heiden in contrast warm sunny weather 'The train track with 90 per mill gradient occasionally connects two completely different weather climates. It can occur that it is winter in Heiden and at the lake it is green. And vice versa: it is cold in Rorschach and sunny in Heiden.'

The pattern in (101) turns out to be an instance of practical possibility or event quantification. The copula *sein* is interpreted as *vorkommen* 'occur' resulting in a quantification over events: *Sometimes it is the case that it is cold, sometimes not*. As a consequence, the speaker could add something like: *and by the way, now it is indeed very cold in Heiden*.

Summing up, in this section it has been pointed out that epistemic *können* comes across in two major guises. Firstly, there is epistemic *kann* bearing indicative morphology. It is fairly rare and it indicates that the underlying evidence on which the epistemic conclusion is based entirely consists of premises that are facts. In contrast, epistemic *könnte* with a subjunctive of the past inflection is much more frequent. As it seems, it can be found with two interpretations: in its *counter-factual premise-reading*, it indicates that some of the underlying premises are counter-factual. Moreover, the epistemic possibility is counter-factual. Thus, it behaves in terms of compositionality exactly as it is expected for an epistemic operator in the scope of a subjunctive past operator. Apart from this, *könnte* can be frequently found with a *non-verified premise-reading*. In this interpretation, the epistemic conclusion is based on evidence that involves premises that are not verified.

This indicates that epistemic modal verbs differ with respect as to how they qualify the underlying evidence. This meets the observation made by Copley (2006, 11) who has illustrated that epistemic *should* is restricted to temporally remote evidence.

4.2.2 *müssen*

The semantic range of *müssen* encompasses the expression of a physical need, an obligation, a practical necessity and an epistemic necessity. Depending on its specific meaning, it is subcategorised for a control infinitive, for a raising infinitive or for a verbless directional phrase. Much in the way of *können*, *müssen* also occurs as quantificational modal verb. Since this only affects those cases in which it is in the scope of negation, it has obviously attracted no attention in the research so far. In these uses, it will be interpreted as a universal quantifier in the scope of a negation ($\neg\forall$) that quantifies over the type of individual encoded by the subject argument.

Control infinitives with event modification

In German, *müssen* is used to express sensations that originate in physical needs related body functions whose initiation are beyond control, such as laughing, sneezing, urinating, defecating and to vomiting. These uses have already been identified as independent interpretations by Becker (1836, 181) as physical necessity readings. Since the necessity originates within the

⁷⁰DeReKo: A08/JUL.06635 St. Galler Tagblatt, 28.07. 2008.

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subject referent in all these cases, Erb (2001, 78) argues that *müssen*, in these instances, involves a dynamic modality. In correspondence, it has to be considered as a control verb, very much in the fashion of the ability use of *können*:

- (102) Clara muss_{dyn} niesen.⁷¹
Clara must sneeze-INF
'Clara needs to sneeze'
- (103) Zwei Zuschauer müssen lachen.
two spectators must laugh-INF
'Two spectators have no other choice but to laugh / two spectators are bursting out laughing.'

Since this variant of *müssen* typically selects intransitive verbs with animate subject arguments, the standard diagnostics for control cannot be applied such as the voice transparency test. Being restricted to a small class of predicates with EXPERIENCER arguments, there is no meaningful environment at all in which it could embed an infinitive that lacks a referential subject such as *regnen* 'rain' or impersonal passives. But this selectional restriction could also be an indication that *müssen* in its physical need reading is not compatible with non-referential subjects. The only diagnostic for control that applies is the unavailability of *de dicto* readings with quantified NPs in subject positions: the quantifier *two* in (103) always takes scope over the necessity operator. The canonical interpretation is one in which the two spectators are each affected by a different neuro-biological stimulus. An interpretation in which the quantifier is interpreted within the scope of the necessity operator would be possible in a scenario in which one neuro-biological stimulus may affect several bodies at the same time. Since in our reality neuro-biological stimuli do not transgress the boundaries of a body, a *de dicto* reading is not plausible for any quantified subject NP that agrees with an instance of *müssen* that encodes a physical need.

As far as these observations hold, there is no reason to consider the physical need reading as a raising construction. Thus, this variant of *müssen* has to involve a control infinitive and selects a subject argument on its own that encodes the source of the modality. This is supported by evidence from Dutch. As Barbiers (1995, 155) argues, the Dutch counterpart *moeten* even occurs as a transitive verb in these contexts:

- (104) Jan moet en plas.
Jan must a pee
'Jan must go for a wee.'

As it has already been indicated in the last section, it is far from clear as to whether there are other interpretations of *müssen* that could involve a control pattern. There is a debate as to which extent deontic modal verbs are control verbs or not, prominent positions are defended by Ross (1969, 86), Jackendoff (1972, 102), Öhlschläger (1989, 105), Palmer (1990, 47), Brennan (1993, 25), Barbiers (1995), Wurmbrand (2001) and Abraham (2001, 18ff.; 2002, 36ff.; 2005, 241, 257, 261). By means of the diagnostics invoked here, it is easier to prove that a verb is a raising verb than proving that it is a control verb. As it will be shown, it is evident that there

⁷¹As cited in Erb (2001, 78).

are deontic instances of *müssen* that are raising verbs but it is no trivial task to find compelling evidence for the existence of deontic modal verbs that are control verbs. This issue will be addressed in more detail in Section 4.2.2.

Control directionals with event modification

Likewise, the physical need reading can also be found with verbless directional phrases.

- (105) Ich muss aufs Klo.
I must at.the toilet
'I need to go to the toilet.'

Again, it is evident that the modal force originates from within the subject referent. Thus, it fulfils the criterion of dynamic modality and as a consequence the subject NP of *müssen* has to be its own argument in these cases rather than an argument that has been raised from an embedded predicate.

Raising infinitives with event modification

As has been demonstrated by Welke (1965, 71), Höhle (1978, 81), Öhlschläger (1989, 105), Palmer (1990, 47), Geilfuß (1992), Kiss (1995, 163), Axel (2001, 40), Reis (2001), Erb (2001, 73) and Wurmbrand (1999; 2001, 201), the German necessity modal verb *müssen* in its circumstantial interpretation behaves like a logical one-place operator or a raising verb. There are at least three different meanings for circumstantial *müssen* with a raising pattern that need to be distinguished: the deontic obligation reading, the practical necessity reading and the quantificational reading, which will be discussed at the end of this section. These interpretations differ with respect to the modal source involved. Whereas in the deontic obligation interpretation the modal source is identified with a human referent, it refers to circumstances or forces of nature in the practical necessity reading. How the modal source is instantiated in quantificational uses is less clear.

As it has been illustrated in Section 4.2.1, raising verbs are characterised by three properties. Firstly, lacking a subject argument, they can occur with a non-referential subject. Accordingly, *müssen* in its practical necessity and in its obligation reading selects predicates that are subcategorised for non-referential subjects such as weather verbs and patterns that do not involve a subject at all:

- (106) Es muss_{deontic} (hier unbedingt noch) schneien.
it must here absolutely still snow-INF
'It is absolutely necessary that it snows here.'
- (107) ... dass (unbedingt noch) getanzt werden muss.
that absolutely still dance-PPP PAS.AUX.INF must.
'It is absolutely necessary that someone dance here.'

Note that *müssen* only exhibits a practical necessity interpretation in the example (106). This is for pragmatic reasons, as it is rather unlikely to impose obligations on the weather or to

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oblige someone to change the weather. In contrast, the example with impersonal passive (107), which does not involve any subject at all, can be interpreted as obligation without any problems. Deontic patterns of *müssen* which do not involve a referential subject can be easily found in corpora, as it is indicated in (108)–(110):

- (108) „Für jede einzelne Tat muss es eine Freiheitsstrafe geben“, sagt die
for each single crime must it a imprisonment give-INF says the
Staatsanwältin in ihrem Plädoyer.⁷²
attorney in her plea
'„For each single of these crimes, the accused must be sentenced with an imprisonment.“
the attorney says in her plea.'
- (109) In Kanada muss künftig länger gearbeitet werden.⁷³
in Canada must henceforth longer work-PPP PASS.AUX-INF
'In Canada, people will have to work longer in future.'
- (110) Bleibt die Miete oder auch die Kautions aus, ist für den Vermieter umgehendes
stays the rent or also the deposit out is for the landlord immediate
Handeln geboten. Jede unnötige Verzögerung vertieft den möglichen
reaction required every unnecessary procrastination increases the possible
Schaden. Mit Kündigung und Klage muss nicht mehrere Monate gewartet
damage with cancellation and complaint must NEG more months wait-PPP
werden.⁷⁴
PASS.AUX-INF
'If the rent or the deposit is not paid, it is necessary for the landlord to react immediately.
Every unnecessary procrastination can increase the damage. It is no longer obligatory to
wait patiently a couple of months before considering a cancellation of the contract or even
a complaint.'

Secondly, as it has been pointed out by von Stechow (2003, 203), Wurmbrand (1999, 606) and Wurmbrand (2001, 192), raising verbs tolerate *de dicto* interpretations of quantified NPs. In the corpus examples, (111) and (112) the indefinite NPs is interpreted in the scope of the modal necessity operator yielding a reading in which the NP does not refer to a particular individual. Whereas (111) involves a practical necessity interpretation, a deontic interpretation turns out to be more plausible for (112).

- (111) Die Arbeit zu zweit ist auch deswegen unerlässlich, weil einer von uns beiden
the work in two is also therefore indispensable because one of us two
immer wach sein muss, um die Piloten des Ballons zu leiten.⁷⁵
always awake be-INF must in.order.to the pilots the-GEN balloon to direct-INF
'The work in pairs is also indispensable for the particular reason that one of the two of us
has to stay awake to pilot the aviators of the balloon.'

⁷²DeReKo: BRZ06/DEZ.00079 Braunschweiger Zeitung, 01.12. 2006.

⁷³DeReKo: A12/MAR.14387 St. Galler Tagblatt, 31.03. 2012.

⁷⁴DeReKo: BRZ06/APR.00020 Braunschweiger Zeitung, 01.04. 2006.

⁷⁵DeReKo: E99/MAR.06800 Zürcher Tagesanzeiger, 13.03. 1999.

- (112) Wollen Jugendliche im Kubus eine Runde »töggelen«, erhalten sie einen
 want adolescent in.the cubus a round play receive they a
 Spielball. Bedingung: Einer muss das Handy als Depot hinterlegen.⁷⁶
 ball condition a must the cell.phone as deposit deposit-INF
 ‘If adolescents want to play a round in the cubus, they will get a ball. There is a condition:
 one of them has to deposit his cell phone.’

Likewise, (113) clearly exhibits a deontic interpretation in a context in which a Sergeant issues an order to his group of soldiers. In this particular context, he does not oblige a particular individual to guard the object. As it appears, the quantifying expression *ein* needs to bear the accent in the NP in such a configuration. Note that it is not relevant here whether *ein* and *einer* are used as an indefinite pronoun or as a numerical determiner in the examples given below, as Carpenter (1998, 87) has illustrated that numerical determiners behave like ordinary existential quantifiers.

- (113) Ein Mann muss die gesamte Nacht das Objekt bewachen.
 a man must the whole night the object guard-INF
 ‘During the whole night, (at least) one person has to guard the object.’

Thirdly, raising predicates are transparent with respect to voice. The sentences (114a) and (114b) involve infinitival complements that refer to the same state of affairs. They only differ with respect to how they encode their subject: in the active example (114a) the subject is the underlying AGENT argument *der Reinhold*, in the passivised example the subject is identified with the underlying THEME argument *der Nanga Parbat*. If *müssen* involved a proper subject argument, it would be expected that the obligation would be imposed on *Reinhold* in (114a) and on the *Nanga Parbat* in the passivised example (114b), yielding an unacceptable interpretation. But as it turns out, the two sentences do not differ with respect to their meaning.

- (114) a. Der Reinhold muß den Nanga Parbat ohne Sauerstoffgerät
 the Reinhold must the-ACC Nanga Parbat without oxygen.apparatus
 bezwingen.
 conquer-INF
 ‘Reinhold has to conquer the Nanga Parbat without oxygen apparatus.’
 b. Der Nanga Parbat muß vom Reinhold ohne Sauerstoffgerät
 the-NOM Nanga Parbat must by.the Reinhold without oxygen.apparatus
 bezwungen werden.
 conquer-PPP PASS.AUX-INF
 ‘The Nanga Parbat has to be conquered by Reinhold without oxygen apparatus.’

Both examples can be either interpreted with an obligation reading or a practical necessity interpretation. Essentially, *müssen* does not assign a semantic role to the subject NP. This becomes most clear in the example that involves the passivised infinitive complement (114b). Being a mountain, the *Nanga Parbat* is no appropriate target for bearing an obligation. Thus, *müssen*

⁷⁶DeReKo: A10/JUN.03327 St. Galler Tagblatt, 10.06. 2010.

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cannot identify its subject as the goal of the obligation in these examples. Corresponding configurations can easily be found in corpora, as is illustrated in (115):

- (115) Der Dokortitel muss aberkannt werden.⁷⁷
the doctor.title must deprive-PPP PASS.AUX-INF
'The doctorate degree must be taken away.'

The given example is a call based on laws and regulation. The only interpretation that is plausible here is a deontic one. Once again, *müssen* agrees with a subject that cannot be considered as its semantic argument. A doctorate degree is no licit bearer of an obligation. Accordingly, the configuration illustrated above has to involve a raising pattern.

As it has been pointed out in the previous section, Carlson (1977, 119) and Brennan (1993, 96) identify certain uses of the possibility modal *can* as quantificational modal verbs. In addition, Brennan briefly discusses some quantificational uses of the necessity modal verb *will*. However, it remains mysterious as to why the less marked necessity modal verb *must* cannot act as a quantifier over indefinite NPs.

Unlike the English necessity modal verb *must*, its German counterpart *müssen* may occur in the scope of a negation. In such a configuration, it can occasionally exhibit an interpretation in which it acts as a quantifier over individuals. In example (116), *nicht müssen* serves as a negated universal quantifier over individuals ($\neg\forall$). It expresses that, in the set of good second-hand cars, there is at least one instance that is not worse than a new car. The remaining examples (117)–(121) behave in an according manner.

- (116) Ein guter Gebrauchtwagen muss nicht schlechter sein als ein Neuwagen⁷⁸
a good second-hand.car must NEG worse be-INF than a new.car
'A good second-hand car does not need to be worse than a new car.'
- (117) Vegetarisches Essen muss nicht langweilig sein.⁷⁹
vegetarian food must NEG boring be-INF
'Vegetarian food does not need to be boring.'
- (118) Kunst muss nicht immer brotlos sein.⁸⁰
art need NEG always bread.less be-INF
'Art does not need to be unprofitable.'
- (119) Ein Hund, der mit dem Schwanz wedelt, muss nicht unbedingt freundlich
a dog that with the tail wags must NEG necessarily cordially
gestimmt sein⁸¹
tempered be-INF
'A dog that wags its tail does not necessarily need to be cordially tempered.'

⁷⁷Der Spiegel 8/2011, p. 27, 21.02 2011.

⁷⁸DeReKo: NUZ11/MAI.01632 Nürnberger Zeitung, 18.05. 2011.

⁷⁹DeReKo: BRZ11/JUN.06063 Braunschweiger Zeitung, 16.06. 2011.

⁸⁰DeReKo: RHZ11/MAI.18218 Rhein-Zeitung, 16.05. 2011.

⁸¹DeReKo: A09/NOV.00330 St. Galler Tagblatt, 02.11. 2009.

- (120) Ein Haus ohne Salonbetrieb muss nicht seelenlos sein.⁸²
 a house without salon.service must NEG soul.less be-INF
 ‘A house without service in the salon does not need to be soulless.’
- (121) Der 4. Juli muss nicht immer ein deutscher Freudentag sein. Auf den Tag
 the 4 July must NEG always a German joy.day be-INF at the day
 genau 44 Jahre nach dem ersten WM-Titelgewinn im Berner
 exactly 44 years after the first world.championship.title in.the Bernese
 Wankdorfstadion (3:2 über Ungarn) hat Deutschland am Samstag in Lyon
 Wankdorf.stadium (3:2 against Hungary) has Germany at.the Saturday in Lyon
 eine der schmerzhaftesten Niederlagen hinnehmen müssen: im
 a the-GEN painful-SUP defeat take- must in.the
 Viertelfinal an WM-Neuling Kroatien gescheitert, mit 0:3
 quarterfinal at world.championship.new.comer Croatia failed with 0:3
 verloren – klar und deutlich, ohne Wenn und Aber.⁸³
 lost clearly and explicitly without if and but.
 ‘The 4th of July does not need to be always a German day of rejoicing. Exactly 44 years
 after the first victory in the world championship final at the Berner Wankdorfstadion, Ger-
 many had to accept a very painful defeat on Saturday in Lyon: they lost against the new-
 comer Croatia in the world championship in a very clear manner with 0:3’

As for the examples (116)–(120), a deontic interpretation does not come into consideration. It makes no sense to impose an obligation that a new car has to be better than a second-hand car or that Vegetarian food has to be boring. However, there are a lot of ambiguous examples such as (121) which can be interpreted as the negation of a call, yielding a deontic interpretation. Similar instances are discussed by Welke (1965, 72) labelled as ‘variante 2’.

It merits attention that the subject NP which is in the scope of the negated universal quantifier is not always realised as indefinite NP. In quite a lot cases, it is represented by a mass nouns, such as *Vegetarisches Essen* ‘vegetarian food’ in (117) and *Kunst* ‘art’ in (118). It remains to be shown how this quantification over the extension of a mass noun can be properly formalised.

Finally, the question arises as to why these types of quantificational uses predominantly occur with the possibility modal verb *können* and the negated necessity modal verb *müssen*. This might be related to the position they occupy in the Aristotelian Square of Oppositions. Both, the I and O corner host particularly valid propositions: the possibility modal verb *können* expresses a particular affirmative proposition, assigning a predication to some but not all items in its restrictor, the universal modal verb *müssen* expresses a particular negative proposition, assigning a predication to not all items in its restrictor. Thus, it seems that modal verbs in configurations that are related to a particular validity are more suitable to act as quantificational modals in German. Whether this phenomenon can be extended to other languages as well remains to be checked by future research.

⁸²DeReKo: A98/OKT.63556 St. Galler Tagblatt, 09.10. 1998.

⁸³DeReKo: A98/JUL.45470 St. Galler Tagblatt, 06.07. 1998.

Raising directionals with event modification

Like *können*, the necessity modal verb *müssen* occurs fairly often along with verbless directional phrases. Once again, there are revealing instances of these configurations in which no infinitive can be inserted without leaving the interpretation of this utterance unaffected, as the discussion in the previous section has revealed.

- (122) Jeans, Hemden, Jacken, Mäntel, Pullis, Anzüge, usw. – alles muss raus
jeans shirts jackets coats sweater suits etc everything must out
(#kommen/ #gebracht werden)!⁸⁴
get carried PASS.AUX-INF
'Jeans, shirts, jackets, sweaters, suits, etc – we have to get rid of everything!'

As it has been already shown above, there are a lot of reasons to consider these usages of modal verbs with verbless directional phrases as independent patterns that cannot be accounted for in terms of an ellipsis of an infinitive.

Raising infinitives with clause modification

As already in the case of *können*, the epistemic uses of the necessity modal verb *müssen* are subject to the CoDeC: the proposition they embed cannot be part of the knowledge of the speaker (deictic centre). Moreover, they occur in environments in which circumstantial modal verbs are ruled out. They can modify predications that involve an identified individual and a predicate that refers to an event in the past (123) and (125) or a temporally unbound state (127) and (128). All the epistemically modified utterances below imply that the proposition is not part of the speaker's knowledge.

- (123) Schreckliche Angst muss der kleine Junge gehabt haben, der am Samstag in
terrible fear must the small boy have-PPP INF that at Saturday in
ein tiefes Loch gefallen ist.⁸⁵
a deep hole fall-PPP is
'The boy must have been terribly frightened when he fell into the deep hole on Saturday.'
- (124) Ereignet haben müssen sich die Taten zwischen Donnerstag, 15 Uhr,
happen-PPP have-INF must REFL the crimes between thursday 15 o'clock
und Dienstag, 6.30 Uhr.⁸⁶
and tuesday 6.30 o'clock
'The crimes must have happened between thursday 3 pm and tuesday 6.30 am.'
- (125) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich um einen
the clothes indicate then also to.it at that it REFL about a
Mann gehandelt haben müsste.⁸⁷
man deal-PPP have-INF must-SBJV.PST

⁸⁴DeReKo: A11/FEB.01302 St. Galler Tagblatt, 04.02. 2011.

⁸⁵DeReKo: BRZ09/JUL.16635 Braunschweiger Zeitung, 06.07. 2009.

⁸⁶DeReKo: BRZ09/APR.06547 Braunschweiger Zeitung, 16.04. 2009.

- ‘The clothes indicate that it must have obviously been a man.’
- (126) Während sie in Mutters Tagebüchern gestöbert hatte, traf sie auf drei
 during she in mothers diaries rummage had met she on three
 Männernamen: Sam, Bill und Harry. Sie lädt diese zu ihrer Hochzeit ein. Einer
 male.names Sam Bill and Harry she invites them to her wedding in one
 von ihnen muss ihr Vater sein, der sie zum Traualtar führen sollte.⁸⁸
 of them must her father be-INF that she to.the altar guide-INF should
 ‘During her inquiries in her mother’s diaries, she could find three male names: Sam, Bill
 and Harry. She invites them to her wedding. One of them must be her father who should
 guide her to the altar.’
- (127) Er muss der Täter sein, denn sein Sperma lässt sich in ihrem Unterleib
 he must the culprit be-INF as his sperm lets REFL in her abdomen
 nachweisen.⁸⁹
 prove-INF
 ‘He must be the culprit because his sperm could be found in her abdomen.’
- (128) Die Menschen schauen inzwischen William und Harry an und erkennen, dass
 the people watch meanwhile William and Harry on and recognise that
 Charles ein guter Vater sein muss⁹⁰
 Charles a good father be-INF must
 ‘Meanwhile, the people take a look at William and Harry and recognise that Charles must
 be a good father.’

Once again, the epistemic modal verb comes across in two morphological realisations: as indicative *muss* and as subjunctive of the past *müsste*. In contrast to the case of *können*, the indicative epistemic *muss* is drastically more frequent than its subjunctive counterpart. Even if subjunctive is rare, it does exist, contradicting Lötscher (1991, 348) who claims that *müsste* can never be used as an epistemic modal verb.

As in the case of epistemic *könnte*, the interplay of the subjunctive and the epistemic modal operator is rather complex and it is no trivial matter to unravel them. In some semantic respects *müssen* behaves here analogously to its possibility denoting counterpart *können*. In quite a lot of distributions, they cannot be mutually be replaced without affecting the interpretation. First of all, the indicative epistemic necessity modal verb *muss* occasionally occurs in the scope of a negation. Like the epistemic possibility modal verb *kann*, these instances cannot be replaced by their subjunctive past counterpart *müsste*.

- (129) a. Der Sachverständige aus Koblenz machte der Sache ein Ende. Unter
 the accident.assessor from Koblenz made the affair a end under
 Berücksichtigung von Fahrverhalten und Bewegungsablauf, Schadensbild,
 consideration of driving.behaviour and path.of.motion damage

⁸⁷DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29.06. 2009.

⁸⁸DeReKo: A09/JUL.00991 St. Galler Tagblatt, 03.07. 2009.

⁸⁹DeReKo: NUZ09/JUN.00298 Nürnberger Zeitung, 04.06. 2009.

⁹⁰DeReKo: SOZ08/NOV.02694 Die Südostschweiz, 14.11. 2008.

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Bodenbelag, Lichtverhältnissen sowie Geräuschkulisse kam er zu dem
road.surface lighting.conditions as.well.as background.noise came he to the
Schluss, dass die Fahrerin den Unfall nicht bemerkt haben muss.⁹¹
conclusion that the driver the accident NEG notice-PPP have-INF must
‘The accident assessor from Koblenz put an end to this affair. Considering the driving
behaviour, the path of motion, the damage, the road surface, the lighting conditions and
the background noise, he came to the conclusion that the driver does not need to have
noticed the accident.’

- b. # [...] kam er zu dem Schluss, dass die Fahrerin den Unfall nicht
came he to the conclusion that the driver the accident NEG
bemerkt haben müsste.
notice-PPP have-INF must-SBJV.PST
Intended reading: ‘[...] he came to the conclusion that the driver does not need to have
noticed the accident.’

- (130) a. Auch die Immobilienkrise in den USA muss noch nicht ausgestanden sein.⁹²
also the real.estate.crisis in the USA must still NEG stand-PPP be-INF
‘It is not necessarily the case that the real estate crises in the US has been already
overcome.’

- b. # Auch die Immobilienkrise in den USA müsste noch nicht
also the real.estate.crisis in the USA must-SBJV.PST still NEG
ausgestanden sein.
stand-PPP be-INF
Intended reading: ‘It is not necessarily the case that the real estate crises in the US has
been already overcome.’

In both examples that involve *müsste* (129b) and (130b), the epistemic necessity operator cannot be construed in the scope of the negation. This indicates that *müssen* with past subjunctive morphology is less acceptable in the scope of a negation, if it is acceptable at all in such environments.

Apart from that, epistemic subjunctive of the past *müsste* resembles the epistemic possibility modal verb *könnte* with subjunctive morphology in another crucial respect: it qualifies the underlying evidence in a similar way. Again, there seem to be different ways as to how the subjunctive past morphology affects the meaning of epistemic *müssen*. First of all, there are cases in which *müsste* indicates that the evidence on which the epistemic conclusion is based involves non-verified premises:

- (131) Die Schuldfrage ist noch nicht gänzlich klar, doch nach ersten Ermittlungen
the guilt.question is still NEG entirely clear but after first investigation
der Bundespolizei scheint das Rotlicht an der Bahnstrecke funktioniert zu
the-GEN federal.police seems the red.light at the railroad.track work-INF to

⁹¹DeReKo: RHZ06/FEB.12183 Rhein-Zeitung, 13.02. 2006.

⁹²DeReKo: RHZ07/OKT.17666 Rhein-Zeitung, 19.10. 2007.

haben. Demnach müsste der Lastwagen-Fahrer bei Rot über die Gleise
 have-INF accordingly must-INF the lorry.driver at red over the track
 gefahren sein.⁹³
 drive-PPP be-INF

‘The issue of who is responsible is not entirely settled yet. According to the investigation carried out by the federal police, the traffic light seems to have worked. In correspondence, the driver of the lorry must have crossed the track when the light was red.’

- (132) Peter Westphal: „Wir haben die Oktobermieten gleich an Curanis/Vivacon
 Peter Westphal we have the October.rent immediately to Curanis/Vivacon
 überwiesen.“ Demnach müsste Vivacon die Mieten erhalten
 transfered accordingly must-SBJV.PST Vivacon the rents receive-PPP
 haben.⁹⁴
 have-INF

‘Peter Westphal: “We have immediately transfered the rent for October to Curanis/Vivacon”
 Correspondingly, Vivacon should have received the rents.’

- (133) Verursacher war wahrscheinlich ein Klein-Lkw oder Lkw, der bei den
 causer was probably a small-lorry or lorry that at the
 Anhängerparkplätzen wendete und hierbei das Auto streifte. Es müsste
 trailer.parking turned and thereby the car scratch it must-SBJV.PST
 sich um ein auffälliges Wendemanöver gehandelt haben, da auf der
 REFL about a noticeable transposition.manoeuvre deal-PPP have-INF as at the
 Teerdecke entsprechender Reifenabrieb zu erkennen war.⁹⁵
 road.surface corresponding tire.abrasion to recognise was

‘It was probably caused by a small lorry or a lorry that hit the car while turning at the trailer parking. It was obviously a noticeable transposition manoeuvre as the road surface exhibited corresponding traces of tire abrasion.’

- (134) Einer der Täter müsste sich die Kleidung während des Überfalls
 a the-GEN culprit must-SBJV.PST REFL the clothes during the robbery
 mit Blut beschmiert haben.⁹⁶
 with blood stain-PPP have-INF

‘One of the culprits hypothetically has to have stained himself with blood.’

A lot of the instances found in the corpus are revealing for the precise nature of the interplay between the epistemic modal verb and the subjunctive operator. Frequently, they explicitly refer to a premise that is not taken for granted. In example (131), the adverb *demnach* is linked to the first shaky results of the investigation carried out by the police indicating that the traffic light was properly functioning. In a similar fashion, the adverb *demnach* refers to the statement made by Peter Westphal in example (132). Though not explicitly, *müsste* in (133) refers to the prior

⁹³DeReKo: BRZ09/JUL.27453 Braunschweiger Zeitung, 31.07. 2009.

⁹⁴DeReKo: BRZ08/JAN.13019 Braunschweiger Zeitung, 29.01. 2008.

⁹⁵DeReKo: RHZ09/NOV.01570 Rhein-Zeitung, 03.11. 2009.

⁹⁶DeReKo: RHZ06/NOV.27737 Rhein-Zeitung, 28.11. 2006.

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assumption that a lorry probably caused the damage while he was turning. Apart from that, there are also examples of epistemic *müsste* that do not involve reference to a premise that has been made explicit in the prior discourse, such as (134). As it seems, the prior discourse includes a non-verified presupposition that describes the circumstances of the robbery, such as that one of the culprits was so close to the victim that a contact with blood was inevitable.

In such configurations, the speaker signals critical distance with respect to the validity of these premises. But crucially, these premises in the examples above are not counter-factual or known to be false. The speaker is just not entirely convinced. In contrast to *könnte*, *müsste* can be replaced by its indicative cognate *muss* more easily in these instances. There appear to be subtle changes in the interpretation.

Secondly, there are interpretations of epistemic *müsste* that are based on counter-factual premises. Analogous examples have been provided by Mortelmans (2000, 206).

- (135) Guido Niedermann fand am Waldboden eine Feder. »Ganz deutlich ist zu sehen, dass diese Feder abgebissen wurde, folglich war dieses Federvieh Opfer eines Marders oder Fuchses. Wäre die Feder ausgerupft worden, müsste der Täter ein Greifvogel gewesen sein«, erklärte Niedermann.⁹⁷
Niedermann

‘Guido Niedermann has found a feather in the forest. “It can be seen very clearly that this feather was bitten off. Thus, this poultry was a victim of a marten or a fox. If the feather were pinched, it would follow that the culprit must have been a raptor.” said Niedermann.’

- (136) Wenn alle Meldungen über Schwangerschaften der Oscar-Preisträgerin gestimmt hätten, müsste sie mittlerweile 30 Babys bekommen haben. Kidman ist Mutter zweier adoptierter Kinder.⁹⁸
have-INF. Kidman is mother two-GEN adopted-GEN children
‘If all those reports about pregnancies of the oscar winner had been true, then she would be supposed to have 30 babies by now. Kidman is mother of two children that she has adopted.’

In both cases, it is evident that the premise expressed by the antecedent of the conditional is counter-factual: in example (135), the speaker makes it explicit that the feather was not pinched. Likewise, the person who utters the sentence in (136) refutes the claim that all reports that Kidman was pregnant were true.

If the *müsste* is replaced by *muss* in the environments in which the epistemic conclusion is based on a counter-factual premise, an important difference with respect to the non-verified

⁹⁷DeReKo: A00/FEB.13497 St. Galler Tagblatt, 22.02. 2000.

⁹⁸DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31.12. 2007.

premise readings becomes apparent. Whereas *müsste* can be replaced by *muss* in non-verified premise readings, such a replacement yields a diminished degree of acceptability in the counter-factual premise readings. As it seems, the subjunctive morpheme of *müsste* is necessary to identify the premise as a counter-factual one. Thus, this clearly indicates that the interaction of the subjunctive operator and the epistemic operator can be construed in terms of semantic composition in counter-factual premise interpretations.

This further illustrates that there are good reasons to distinguish between the non-verified and the counter-factual premise interpretation of *müsste*. Whereas the latter is an evident result of a compositional interplay of the counter-factual operator and the epistemic operator the status of the first type is less clear.

As it has been shown in the preceding section, there are two ways of expressing the subjunctive of the past in German: the synthetic form (*müsste*) and an analytic form consisting of the subjunctive past auxiliary *würde* and a bare infinitive (*müssen*). If the counter-factual premise interpretation is indeed result of semantic composition, it is expected that it should also be available if the subjunctive operator *würde* and epistemic modal operator (*müssen*) are combined in a periphrastic manner, and indeed such instances of the counter-factual premise interpretation can be found:

- (137) Der Autor: „Die Zukunft gehört der Tätigkeitsgesellschaft, in der Erwerb und Nichterwerb, Arbeit und Leben eine Einheit bilden und das Zeitdenken Vorrang vor dem Gelddenken hat.“ Demnach würde uns freie Zeit in Zukunft wichtiger sein müssen als Gut und Geld. Seit 1990 registrieren Statistiker aber einen gegenläufigen Trend.⁹⁹
- the author the future belongs the occupation.society in which earning and non-earning, work and life a union constitute and the time.thinking priority before the money.thinking has accordingly SBJV.PST.AUX us free time in Zukunft wichtiger sein müssen als Gut und Geld. Seit 1990 registrieren Statistiker aber einen gegenläufigen Trend.⁹⁹
- register statistician yet a contrary trend
- ‘The author claims: “The future will be dedicated to the occupation society in which earning and non-earning, work and life constitute a union and time based reasoning prevails money based reasoning.” Accordingly, it would be the case that spare time must be more important to us in future than money and goods. However, since 1990 statisticians observe a development in the opposite direction.’

In example (137), the speaker refers to a hypothesis of some author about the future of our society that he considers as false. It appears to be much more difficult if possible at all, to find an appropriate context in which a periphrastic form of the subjunctive of the past of *müsste* can be construed with a *non-verified premise* interpretation.

Though not obvious, a compositional analysis of the *non-verified premise* interpretation does not seem to be entirely excluded. Yet, it remains to be pointed out how these readings could be derived in a compositional way.

At this point the question arises of what the precise nature of these counter-factual operators is with respect to the status of the epistemic conclusion. As it appears, the *counter-factual premise*

⁹⁹DeReKo: NUN98/MAI.01774 Nürnberger Nachrichten, 23.05. 1998.

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interpretations occur predominantly in counter-factual (irrealis) conditionals. Accordingly, one could conclude that those cases in which epistemic *müsste* is not modified by a *wenn*-clause should be considered as truncated counter-factual (irrealis) conditionals.

According to Kasper (1987, 24ff.), the semantic contribution of the subjunctive past operator is that the modified proposition cannot be felicitously uttered. Applied to epistemic modal verbs, this would indicate that the epistemic conclusion is not drawn in the actual world, as one of the required premises is known to be false. More precisely, the speaker would signal that he is not in the position to draw this conclusion in the actual and that he would be able to do so in a minimally different possible world. Rephrasing the epistemic necessity modal operator in possible world semantics, this would yield the following circumscription: In a minimally different possible world, it is consistent with all the possible worlds that are consistent with the speaker's knowledge in that hypothetical world. As it becomes clear, the description of epistemic modal operators in the scope of a counter-factual operator requires possible worlds that are interpreted in another, non-actual world. This is a very intricate matter that cannot be solved here entirely.

Likewise, it needs to be investigated to which extent a hypothetical assumption involves an assumption in the real world. Even if a speaker using *müssen* might indicate that he is not in the position to draw this particular conclusion, he nevertheless communicates an epistemic evaluation of the modified proposition. At least at some meta level, he makes an assessment about the validity of the proposition in the actual world.

In a similar fashion, this reasoning could equally apply to the *non-verified premise* interpretation of *müsste*. In such an environment, the speaker would signal that he does not know whether the premise holds or not. If he knew that the premise were true, then he would draw the epistemic conclusion expressed by the epistemic modal verb.

Such an analysis that considers the entire act of conclusion as counter-factual could also account for those cases in which the speaker knows the embedded proposition to be false. As it has been pointed out in the preceding section, the usage of an epistemic modal operator indicates that the embedded proposition is not part of the speaker's (deictic centre's) knowledge. In the most canonical case, the speaker would not know that the embedded proposition is false either. This is most natural for counter-factual readings such as in (135) and (136). It has yet to be shown as to which extent such a configuration, in which the modified proposition is known to be false, is also compatible with a *non-verified premise* interpretation.

Until this point, epistemic *müsste* behaves very similarly to epistemic *könnte*. But whereas *kann* can be easily replaced by its subjunctive counterpart *könnte* in most environments without drastically affecting the overall interpretation, *muss* cannot be replaced by *müsste* in quite a lot of contexts:

- (138) Der Wagen rollte vom Bahnsteig auf das Gleis und wird prompt von
the car rolled from.the platform on the rail.track and is promptly by
einem einfahrenden Zug erfasst und 40 Meter mitgeschleift. Der Bub muss einen
a approaching train hit and 40 Meter with.dragged the boy must a
besonderen Schutzengel gehabt haben: Er kam mit leichten Verletzungen
particular guardian.angel have-PPP have-INF he came with light injuries

davon.¹⁰⁰

away

‘The car rolled from the platform onto the rail track and it was immediately hit by a passing train and dragged along a distance of 40 meters. The boy must have had a particular guardian angel: he survived with small injuries.’

- (139) Es muss ein schlimmes Bild gewesen sein, das sich der Frau bot, die
it must a bad picture be-PPP be-INF that REFL the woman offered that
gestern morgen früh als erste am Unfallort eintraf.¹⁰¹
yesterday morning early as first at.the accident.location arrived
‘It must have been a bad scene to see for the woman, who arrived first at the accident yesterday early in the morning.’
- (140) Eine Henauerin hat erzählt, dass sie vor dem Kirchgang dem Bäcker einen
a Henauerian has told that she before the church.going the baker an
Apfel gebracht habe. Nach dem Kirchgang hat sie ihn wieder
apple brought have-SBJV.PRS after the church.going have she him again
abgeholt, schön im Teig gebacken, und es muss so gut geschmeckt
up.picked beautifully in dough baked and it must so good taste-PPP
haben!¹⁰²
have-INF
‘A Woman from Henau said that she left an apple after going to the church, then she picked it up again, well baked in dough and it must have tasted so well!’
- (141) Dabei muss er das Fahrzeug einer 29 Jahre alten Frau übersehen haben,
thereby must he the vehicle a-GEN 29 year old woman miss-PPP have-INF
die mit ihren Kindern auf dem Weg zu einem Freizeitpark war.¹⁰³
who with her children on the way to a amusement.park was
‘In doing so, he must have missed the car of a 29 year old woman who was driving her children to an amusement park.’
- (142) Der Anblick, der sich den Rettern bot, muss schrecklich gewesen sein.¹⁰⁴
the sight that REFL the rescuer offered must awful be-PPP be-INF
‘It must have been such an awful sight for the rescuers.’
- (143) Rund um mein Hotel in der Innenstadt gibt es nur kostenpflichtige
around around my hotel in the citycentre gives it only with.costs
Parkplätze. Das muss ich wohl übersehen haben – prompt klebte an
parking that must I obviously miss-PPP have-INF promptly stucked at
meinem Mietwagen ein Ticket.¹⁰⁵
my hire.car a ticket

¹⁰⁰DeReKo: A09/OKT.04501 St. Galler Tagblatt, 17.10. 2009.

¹⁰¹DeReKo: A09/JUL.07445 St. Galler Tagblatt, 30.07. 2009.

¹⁰²DeReKo: A09/NOV.01850 St. Galler Tagblatt, 06.11. 2009.

¹⁰³DeReKo: BRZ09/JUL.25816 Braunschweiger Zeitung, 27.07. 2009.

¹⁰⁴DeReKo: A09/FEB.01731 St. Galler Tagblatt, 07.02. 2009.

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‘Around my hotel in the city centre, there are only parking slots with costs. I must have missed that and promptly there was a ticket on my hire car.’

- (144) Es muss eine Herkulesarbeit gewesen sein, das weitversprengte Notenmaterial
it must a hercules.work be-PPP be-INF the widely.scattered sheet.music
der 1813 uraufgeführten »Medea in Corinto« zu sammeln¹⁰⁶
the-GEN 1813 premiered Medea in Corinto to collect-INF
‘It must have been a troublesome work to collect the widely scattered sheet music of the
“Medea in Corinto”, which has been premiered in 1813.’

In all the examples (138)–(144), a substitution by *müsste* would affect the interpretation. Interestingly, the epistemic necessity modal *muss* can be much more successfully be replaced by the epistemic probability modal verb *dürfte* in the given instances. This indicates that *müsste* cannot be considered as a necessity modal that involves a necessity that is slightly weaker than the one of *muss*, otherwise it would be expected that the replacement by *dürfte* should yield an even lesser degree of acceptability. The analysis provided by Fritz (1997, 101) and Mortelmans (2000, 205), who argue that the presence of a subjunctive of the past morpheme weakens the degree of necessity, cannot, thus, be right.

These examples constitute a revealing case for the identification of the precise semantics of *muss* and *müsste*. After *müsste* has been inserted in such an example, it just needs to be detected how the context needs to be changed in order to make *müsste* fully acceptable again, as is illustrated in the modified version of (138):

- (145) Der Bub müsste einen besonderen Schutzengel gehabt haben
the boy must a particular guardian.angel have-PPP have-INF
‘??(In this case) The boy must have had a particular guardian angel.’

In order to repair the context according to (145), one of the underlying premises needs to be adjusted. In the version with the indicative epistemic modal verb *muss* (138), the speaker grounds his conclusion on at least two verified premises: {*the boy has been dragged along by a train, the boy has survived with small injuries* }. In order to create an appropriate context for *müsste* one of these verified premises has to be refuted or labelled as non-verified or counter-factual. Depending on the context, it appears that the use of *müsste* requires that the most prominent premise has to be non-verified or counter-factual.

This could be again a hint that the instances of *müsste* with subjunctive past involve a conditional configuration in which the non-verified premise is hosted by the antecedent. In some cases, the antecedent is explicitly realised as *wenn*-clause, in the other cases it remains implicit. This also explains why epistemic *müsste* cannot express conclusions that are based on direct evidence from the utterance situation. In this case, the most prominent premise would be a state of affairs that is accessible by all sort of senses, therefore, the premise would be verified already and impossible to contradict.

¹⁰⁵DeReKo: BRZ09/JAN.04683 Braunschweiger Zeitung, 12.01. 2009.

¹⁰⁶DeReKo: A09/OKT.04815 St. Galler Tagblatt, 19.10. 2009.

This behaviour reveals the nature of the subjunctive morpheme on *müsste*: it acts as a qualifier for the underlying evidence involved. The evidence on which the epistemic conclusion is drawn needs to include premises that are not verified or even known to be false.

Summing up, epistemic *müssen* comes along in two guises: the indicative form *muss* and the subjunctive of the past *müsste*. As in the case of epistemic *könnte*, epistemic *müsste* occurs in two functions: it either indicates that one of the premises on which the epistemic conclusion is based is not verified or it indicates that one of the premise is counter-factual. Unlike its indicative counterpart, the subjunctive epistemic necessity modal verb *müsste* is not acceptable in the scope of a negation. In all these aspects, *müsste* much resembles the subjunctive epistemic possibility modal verb *könnte*. But these verbs differ with respect to which extent they are interchangeable with their indicative cognates: whereas the subjunctive epistemic necessity modal verb *müsste* can be more easily replaced by the indicative *muss*, the subjunctive epistemic possibility modal verb *könnte* cannot be substituted by *kann* in most contexts without affecting the interpretation. Vice versa, the indicative epistemic modal necessity verb *muss* resists a substitution by its subjunctive counterpart *müsste*, whereas the indicative epistemic possibility verb *kann* can always be replaced by its subjunctive cognate *könnte*.

4.2.3 *wollen*

The volitional modal verb *wollen* is well studied and there is much consensus about the manner in which it behaves. The semantic range covers the expression of volition, reported speech, as well as a volition that originates in a referent distinct from the subject referent. The volitional semantics have remained fairly stable through the course of history. Following the tradition put forth by Bech (1949, 38), *wollen* is generally held as necessity modal verb that involves a modal source that lies within the subject referent.

Transitive uses

As it has been noticed at various occasions, there are instances of *wollen* that occur with an accusative NP without infinitive, as it has been pointed out by Raynaud (1977, 5, 20). The status of these occurrences is contested. On the one hand, there are authors such as Öhlschläger (1989, 69) who argue that these instances involve an ellipsis of the infinitive. On the other hand, there are authors such as Zifonun (1997, 1255), Erb (2001, 96) and Eisenberg (2004, 97) who argue that in these uses *wollen* surfaces as a transitive verb. These authors illustrate their claim with passivised examples of *wollen*. Such patterns are also attested in corpora, as shown in (146)–(148):

- (146) ‘Man müsse zur Kenntnis nehmen, daß der Einzug von Ausländern in
 one must at notice take that the move-in-NOM of foreigners in
 Gemeindewohnungen einfach von den Leuten nicht gewollt wird, meinte
 flats.of.the.township simply by the people NEG want-PPP PASS.AUX said
 Häupl.¹⁰⁷
 Häupl
 ‘One has to acknowledge that the people simply do not want that foreigners move into flats
 of the township.’

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lit: the move in is not wanted by the people

- (147) Nur der Waffenstillstand hat Bestand der von innen her
 only the ceasefire has continuance that-REL.PRN.NOM from inside PAR
 kommt und von allen Kriegsparteien gewollt wird¹⁰⁸
 comes and by all war.parties want-PPP PASS.AUX
 ‘A ceasefire can only persist if it is proposed from the inside and if it is wanted by all the warring parties.’

lit: a ceasefire is wanted by all the warring parties

- (148) Die politisch-planerisch Verantwortlichen müssen begreifen, daß vor
 the political-planner-ADJ responsible.person must understand that foremost
 allem ein Theaterzentrum mit sozio-kultureller Bedeutung von den Menschen
 a theater center with socio-cultural relevance by the people
 dieser Stadt gewollt wird¹⁰⁹
 of this city want-PPP PASS.AUX
 ‘The people responsible for political planning must understand that the people of this city want a theatre centre with socio-cultural relevance.’

lit: that a theatre centre is wanted

Öhlschläger (1989, 69) acknowledges that *wollen* can occasionally be passivised but, according to his view, it is not fully productive. As a consequence, *wollen* with an accusative NP has to involve an ellipsis of an infinitive. According to Öhlschläger (1989, 69), it is always the infinitive *haben* ‘have’ that is elided here. Yet, Öhlschläger’s arguments are not plausible for two reasons. First of all, passivised *wollen* occurs much more frequently than passivised *können*. This is remarkable, as word forms related to *können* are much more frequent than those related to *wollen* in the archive W of the DeReKo corpus on which the study here is based. So if *können* is considered as “fully productive” with respect to its passive, it remains mysterious as to why the passive of *wollen* should be “less productive”. Whoever considers *können* as a transitive verb has to consider *wollen*, as well. Secondly, if Öhlschläger (1989) were right in his assumption that *wollen* without an infinitive complement should be considered as an ellipsis of *haben*, it is expected that the examples in (146)–(148) should be derived from configurations in which the infinitive *haben* is spelled out overtly. However, inserting an infinitive of *haben*, the acceptability of such configurations drastically decreases, as is highlighted in (149)–(151).

- (149) * Der Einzug von Ausländern in Gemeindewohnungen wird von den
 the move-in of foreigners in flats.of.the.township PASS.AUX by the
 Leuten nicht haben gewollt
 peopleNEG have-INF want-PPP
- (150) * Ein Waffenstillstand wird von allen Kriegsparteien haben gewollt
 a ceasefire PASS.AUX.PST by all war.parties have-INF want-PPP

¹⁰⁷DeReKo: N93/FEB.06544 Salzburger Nachrichten, 22.02. 1993.

¹⁰⁸DeReKo: P91/NOV.08961 Die Presse, 29.11. 1991.

¹⁰⁹DeReKo: R98/DEZ.102438 Frankfurter Rundschau, 19.12. 1998.

- (151) * Ein Theaterzentrum wird von den Menschen haben gewollt
 a theater.center PASS.AUX.PST by the people have-INF want-PPP

The contrast between (146) and (149) remains unaccounted for under an analysis that treats *wollen* with an accusative NP as an ellipsis of the infinitive *haben*.

There are further instances of *wollen* with NP that cannot be complemented with the infinitive *haben* such as the question pattern in (152a):

- (152) a. A: Was willst du hier (*haben)?
 what want you here have-INF
 b. B: Ich will mit dir reden.
 I want with you talk-INF
 A: ‘What do you want here?’
 B: ‘I want to talk with you’

The *wh*-pronoun does not seem to be a canonical VP-anaphor. If this was the case, it should be possible to substitute *wollen* in (152a) by other verbs such as *dürfen* or *müssen*. But such a replacement is not possible.

Nevertheless, it seems to be possible to coordinate an accusative NP complement with a bare infinitive complement of *wollen* in some contexts.

- (153) Wir wollen Sonne statt Reagan, ohne Rüstung leben.¹¹⁰
 we want sun instead.of Reagan without weapons live-INF
 ‘We want sunshine rather than Reagan and to live without arms.’

As it is generally held, coordination requires the identity of the categories of both constituents. A more detailed discussion is given by Dougherty (1970, 850, 864), Jackendoff (1977, 51), Gazdar (1981, 157, 173), Schachter (1984, 269) and Pollard and Sag (1994, 202). Thus, the pattern (153) would presuppose that *Sonne* ‘sun’ has the same category as the infinitive complement *ohne Rüstung leben*. Accordingly, the constituent *Sonne* must be part of an infinitive that has an elided verbal head. Even if an analysis in terms of ellipsis might be attractive for this example, there are strong reasons for the existence of instances of transitive *wollen*, as the data on passivisation indicates. Alternatively, the pattern in (153) could be considered as asymmetric coordination.

dass-Sätze

As it has been pointed out by Becker (1836, 181), Welke (1965, 78), Raynaud (1977, 6, 20), Fritz (1997, 17), Erb (2001, 96) and Eisenberg (2004, 96) *wollen* occasionally selects finite *dass*-clauses. Welke (1965, 78) suggests that the *dass*-clause is the result of a transformation that has been applied to the infinitive complement. Likewise, Öhlschläger (1989, 70) stresses that, in these patterns, the *dass*-clause fulfils the same function as the infinitive complement. Therefore, he argues that these configurations do not involve an ellipsis of an infinitive.

¹¹⁰Joseph Beuys and BAP, election spot for the Green Party released in April 1982.

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- (154) Unser Chef will nicht, dass so viele Ausländer bei uns drin sind¹¹¹
our boss wants NEG that so many foreigners in us in are
'Our boss does not want that so many foreigners enter our place.'
- (155) Nur 32 Prozent wollten, dass Schwarz-Gelb weitermacht.¹¹²
only 32 percent wanted that black-yellow continues
'Only 38 percent wanted that the Black-Yellow coalition remain in power.'

This clearly indicates that the infinitive is not mandatory with *wollen*. The fact that the subject of *wollen* and the subject of the *dass*-clause are disjoint in their reference in the most canonical case has motivated some authors such as Szumlakowski-Morodo (2006, 325) to assume that this configuration is due to a syntactical restriction. In contrast, Vater (2001) and Reis (2001, 303) have illustrated that the two subjects can occasionally bear the same index. Such patterns are also attested in corpora:

- (156) Ich will, dass ich meinen Kindern auch Elefanten im Tiergarten zeigen
I want that I my children also elephants in.the zoo show-INF
kann.¹¹³
can
'I want that it is possible that I can also show the elephants in the zoo to my kids.'

Control infinitives with event modification

The status of volitional *wollen* with an infinitive is less controversial. Most authors such as Bech (1949, 5), Welke (1965, 78), Raynaud (1977, 19), Höhle (1978, 84) and Diewald (1999, 140) assume that it involves a proper referential subject argument that encodes the modal source besides its infinitive argument. In more recent approaches, such verbs are considered as control verbs. Accordingly, Öhlschläger (1989, 119), Kiss (1995, 162), Reis (2001, 302), Axel (2001, 40), Erb (2001, 78), Wurmbbrand (2001, 170) and Abraham (2001, 18ff.; 2002, 36ff.; 2005, 241, 257, 261) classify the volitional use of *wollen* as a control verb. It is not contested at all that it assigns a semantic role to its syntactic subject.

- (157) Zu Guttenberg will das Jagdbombergeschwader 33 modernisieren.¹¹⁴
Zu Guttenberg wants the fighter.bomber.squadron 33 modernise-INF
'Zu Guttenberg wants to modernise the fighter bomber squadron 33.'

Becker (1836, 181) considers *wollen* as a necessity modal verb with a particular specification. Likewise, Bech (1949, 5, 39) argues that the strength of the modal relation expressed by *wollen* resembles the one expressed by *müssen* and *sollen* rather than the one encoded by *können*, *dürfen* and *mögen*. In a similar manner, Calbert (1975, 36 Fn.2), Ehrich (2001, 165) and Remberger (2010, 165, 169) point out that *wollen* is most appropriately analysed as a necessity modal

¹¹¹DeReKo: BRZ07/JUN.09793 Braunschweiger Zeitung, 12.06. 2007.

¹¹²DeReKo: HMP11/MAR.02571 Hamburger Morgenpost, 28.03. 2011.

¹¹³DeReKo: NUN11/MAR.02889 Nürnberger Nachrichten, 28.03. 2011.

¹¹⁴DeReKo: RHZ10/JAN.06017 Rhein-Zeitung, 15.01. 2010.

verb that involves a necessity that has its source within the subject argument referent. It can be distinguished from the control use of *müssen* which expresses a physical need by means of the ordering source. The universal quantifier contributed by *wollen* quantifies over those worlds that are consistent with the preferences of the speaker.

Control directionals with event modification

As with *können* and *müssen*, the volitional verb *wollen* can frequently be found with verbless directional phrases.

- (158) Deutschland will weg vom Atomstrom.¹¹⁵
 Germany wants away from nuclear.electricity
 ‘Germany wants to get away from nuclear electricity.’

As it has been demonstrated in Section 4.2.1, configurations such as the one in (158) cannot be efficiently captured as ellipses of an infinitive.

Raising infinitives with event modification

Bech (1949, 9) has already acknowledged that *wollen* occasionally occurs with inanimate subject NPs. As the syntactic subject is no licit bearer for an EXPERIENCER-role, a canonical volitional interpretation is not appropriate. In a similar fashion, Welke (1965, 85) observes uses of *wollen* with impersonal subjects which involve a semantics which cannot easily be captured. In later works such as von Stechow and Sternefeld (1988, 446), Öhlschläger (1989, 170), Kiss (1995, 161, 167), Reis (2001, 302) and Wurmbrand (2001, 170) these occurrences are considered as the raising use of *wollen*.

As some of these authors stress, *wollen* does not appear with a figurative meaning here. The inanimate subject does not receive an anthropomorphic interpretation resulting in a metaphoric volitional reading. There is no semantic relation at all between its syntactic subject and *wollen* in these cases. This is most convincingly illustrated by the fact that this use of *wollen* occurs with non-referential subjects.

As it seems, at least three different types of *wollen* with raising structure have to be differentiated. First of all, there is one type, which preferably occurs in negative polarity environments (159)–(164). In a similar fashion, Brinkmann (1962, 367) has already observed that there is a use of *wollen*, which occurs only in negative contexts and that does not encode volition of the subject referent. Rather, it expresses that the event denoted by the embedded infinitive continues to happen against the expectation of the discourse participants.

- (159) Heute will es scheinbar gar nicht mehr aufhören zu regnen.¹¹⁶
 today want it obviously INTN NEG more stop-INF to rain-INF
 ‘Today, it does not seem to happen to stop raining.’

¹¹⁵DeReKo: HMP11/MAR.01535 Hamburger Morgenpost, 17.03. 2011.

¹¹⁶DeReKo: RHZ02/FEB.07812 Rhein-Zeitung, 12.02. 2002.

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- (160) Als das Filmteam um »die Knef« in Nürnberg ankam, wollte es nicht
As the film.crew around the Knef in Nürnberg arrive wanted it NEG
aufhören zu regnen.¹¹⁷
stop-INF to rain-INF
'When the film crew, along with the Knef, arrived in Nürnberg, it did not happen to stop
raining.'
- (161) Auch nach 24 Jahren Wahnsinn und wahnsinnigen 17 Studioalben will es einfach
also after 24 years madness and madly 17 studio want it simply
nicht ruhig werden um die Thrash-Metal-Supernova „MegaDave”
NEG become quiet around the Trash-Metal-Supernova “MegaDave”
Mustaine.¹¹⁸
Mustaine
'Even after 24 years of madness and unbelievably 17 studio albums, there is nothing that
can stop the Trash-Metal-Supernova “MegaDave” Mustaine.'
- (162) Ein Interessent wartet schon lange auf den erlösenden Anruf Haiders, aber es
an interested waits already long for the liberating call Haider-GEN but it
will einfach nicht läuten: Der F-Sprecher im Landesschulrat,
want simply NEG ring: the F-spokesman in.the regional.education.authority
Erich Petschacher.¹¹⁹
Erich Petschacher
'There is an interested person, which is already waiting for Haider's liberating call for a
long time, but the telephone simply does not happen to ring: the spokesman of the F in the
regional education authority, Erich Petschacher.'
- (163) Irgendwie will und will es nicht Frühling werden.¹²⁰
somehow want and want it NEG spring become
'Somehow, it does not happen to be spring.'
- (164) Im Gegensatz zu seinen Klassenkameraden, will und will bei ihm kein einziges
in contrast to his class.mates wants and wants at him no single
Schamhaar wachsen, obwohl er doch wie toll in Katharina verschossen ist.¹²¹
pubic.hair grow although he PAR like insane in Katharina mad is
'Unlike his classmates, he waits desperately for his first pubic hair to grow, although he has
a crush on Katharina.'

Typically this variant of negated *wollen* co-occurs with the reinforcing sentence adverb *einfach* 'simply', as illustrated in (161)–(162) or re-duplication of *wollen* cf. (163)–(164). It merits closer attention that the string *will und will* seems to be restricted to negative polarity environments: among 239 hits found in the DeReKo corpus based on the query with the string *will*

¹¹⁷NUN04/MAI.01869 Nürnberger Nachrichten, 21.05. 2004.

¹¹⁸DeReKo: HMP07/JUN.01431 Hamburger Morgenpost, 14.06. 2007.

¹¹⁹DeReKo: K99/JUN.45893 Kleine Zeitung, 22.06. 1999.

¹²⁰DeReKo: RHZ09/MAR.09602 Rhein-Zeitung, 11.03. 2009.

¹²¹DeReKo: M05/MAI.35869 Mannheimer Morgen, 02.05. 2005.

und will, there is not a single one without a negation. This is a strong indicator in favour of an analysis that treats this use of *wollen* as negative polarity item.¹²²

The exact interpretation of the negative polar raising verb *wollen* is hard to capture. Even if the examples (159)–(164) do not involve an overt bearer of the volition, it appears that such a referent is contextually required. All the examples describe a state of affair that does not happen to be. But moreover, they are only fully acceptable if there is a referent that wants that state of affair happen. The utterance in (163) is only felicitous if there is a referent that wants that it is spring. Obviously, this contribution is most efficiently captured by the presupposition *x wants p to happen*.

The interpretation of the negative polar raising verb *wollen* is to some extent reminiscent of the behaviour of concessive epistemic *mögen*, as it has been characterised by Welke (1965, 110), Allard (1975, 69,70), Öhlschläger (1989, 187) and Diewald (1999, 236). Both patterns involve some referent that is the source of a volition but that is not overtly encoded in the clause. Such an analysis is furthermore indirectly supported by Schoetensack (1856, 294). As he observes there are further uses of *mögen* that involve a volition attributed to a third party, as in *er möge hereinkommen* ‘He likes-SBJV.PRS enter / fig. He may enter’. In this case, *möge* expresses that the embedded proposition is consistent with the wishes of the speaker.

A contrasting analysis is suggested by Gergel and Hartmann (2009). As they assume, *wollen*, in its volitional interpretation, is a raising verb which does not give up its ability to assign a thematic role to identify the source of volition. In the canonical case, it is the subject argument of the embedded infinitive that raises to the syntactic subject position of *wollen* (SpecVP) and receives the EXPERIENCER-role from *wollen*. Furthermore, they argue that depending on the type of embedded predicate the raised argument can also be a dative object. In the case of impersonal verbs such as *gelingen* ‘succeed’ or *schmecken* ‘taste’, the least oblique argument is an EXPERIENCER dative NP which is claimed to be raised into the subject of *wollen* where it should be identified as source of volition, according to the analysis put forth by Gergel and Hartmann (2009, 337).

- (165) Ihm will einfach nichts gelingen.¹²³
 him-DAT wants simply nothing succeed
 ‘He just doesn’t succeed anything (although he tries....)’
- (166) Dem Großvater will die Suppe nicht schmecken.¹²⁴
 the-DAT grandfather wants the soup-NOM NEG like
 ‘The grandfather does not like/want to like the soup.’

According to their analysis, the EXPERIENCER argument of *wollen* is identified with the dative NP *ihm* in (165) and the dative NP *dem Großvater* (166). As a consequence, they conclude that all modal verbs in German are raising verbs (General Raising Hypothesis). Some of them, such as *wollen*, nevertheless assign thematic roles to their syntactic subjects. Thus, Gergel and Hartmann (2009, 350) assume that raising into theta position is possible, abandoning the classical Theta Criterion.

¹²²Corpus query carried out on 21th March 2012 based on the string *will "und" will*.

¹²³As quoted in Gergel and Hartmann (2009, 331).

¹²⁴As quoted in Gergel and Hartmann (2009, 331).

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However, their account suffers from a major short coming. There are examples very similar to the one they discuss which do not contain any NP that could potentially identified as the source of volition or EXPERIENCER argument of *wollen*, such as cases in which the embedded predicate is *klappen* ‘work out’ in (167).

- (167) Die Jungs haben brutal gekämpft, aber es will einfach nicht klappen mit der
the boys have brutally struggled but it want simply NEG work.out with the
Goldmedaille.¹²⁵
gold.medal
‘The boys struggled terribly but it didn’t happen that they won the golden medal.

Lacking an appropriate animate argument, *klappen* does not provide an appropriate candidate that could be identified as the source of volition. Moreover, it involves a non-referential subject which in turn indicates that it can only be embedded by a raising verb. A similar reasoning applies to the examples in (159)–(164), they cannot be accounted for by the analysis elaborated by Gergel and Hartmann (2009).

The alternative outlined here is to analyse the examples (165) and (166) discussed by Gergel and Hartmann (2009) not as an instance of oblique raising of dative objects into theta positions but to subsume them to a more general phenomenon. Accordingly, they could be analysed along the same lines as the ones above.

Furthermore, these examples are not instances of ‘weak *wollen*’ discussed by Ehrich (2001, 165). Following Bech (1949, 5), she assumes that some instances of *wollen* involve an underlying possibility operator rather than a necessity operator. In any case, as these uses also need to overtly specify their source of volition, they could not account for the patterns in (159)–(164) and (167), as these clauses do not involve appropriate arguments.

Apart from the negative polar raising uses of *wollen*, there seem to be at least two further types of raising patterns. As it has been shown by Helbig and Buscha (2001, 121), there are occurrences of *wollen* that seem to express a mere necessity, that can be replaced by *müssen* without affecting the interpretation too much.

Arguably, these uses should also be considered as raising verbs. Such uses become evident with embedded predicates that are passivised. Often, they involve a promoted THEME argument that is inanimate. As it has been shown in the Sections 4.2.1 and 4.2.2, such environments are typical for raising verbs. As it appears, this use of *wollen* is occasionally modified by the adverbs *erst* and *einmal*.

- (168) Der Name des Coiffeurgeschäfts will deshalb gut gewählt sein.¹²⁶
the name the-GEN hairdresser.shop-GEN wants therefore well choose-PPP be-INF
‘Therefore, the name of the hairdresser saloon needs to be well chosen.’
- (169) Dazu kommen die Länder Osteuropas, deren Sprung in die
to.it come the countries Eastern.Europe-GEN REL.PRN.GEN leap in the
Marktwirtschaft auch erst einmal finanziert sein will.¹²⁷
market.economy also first once finance-PPP be-INF wants

¹²⁵DeReKo: M11/MAR.01983 Mannheimer Morgen, 05.03. 2011.

¹²⁶DeReKo: A09/MAI.04520 St. Galler Tagblatt, 14.05. 2009.

‘In addition to this, there are the Eastern European countries and their leap into a market economy is not so easy to finance.’

- (170) Ach, du schöne Ferienzeit. Und was wäre sie ohne Vorfreude? Doch
 oh you beautiful holiday and what was she without anticipation but
 will die schönste Zeit des Jahres auch gut vorbereitet sein.¹²⁸
 wants the beautiful-SUP time the-GEN year-GEN also well prepare-PPP be-INF
 ‘Oh, beautiful time of holiday! And what would it be without the pleasant anticipation? But
 the most beautiful time of the year also needs to be well prepared.’
- (171) Eine Lok ohne Wagen kostet schon einige Euro. Und auch eine gute
 a locomotive without cars cost already some Euro and also a good
 Werkzeugausstattung will erst einmal bezahlt sein.¹²⁹
 tool.equipment wants first once pay-PPP be-INF
 ‘A locomotive without cars already costs a couple of Euros. And in addition, a good tool
 kit is not so easy to pay for.’
- (172) Die Betreiber des Capitol schätzen den entstandenen Schaden auf rund
 the operators the-GEN Capitol-GEN estimate the caused damage at about
 60 000 Euro – ein Loch, das erst einmal gestopft werden will.¹³⁰
 60 000 Euro a hole that first once plug-PPP PASS.AUX wants
 ‘The operators of the Capitol estimate that the caused damage amounts to 60 000 Euros – a
 hole that one has yet to close/that is not so easy to close.’
- (173) Auch hier wird sich erweisen, daß [...] nicht nur einfach Glanz zu ernten
 also here will REFL prove that NEG only simply brilliance to harvest
 ist, sondern Jahr für Jahr zwölf Monate harte organisatorische Arbeit den Erfolg
 is but year for year twelve months hard organisational work the success
 begründet. Diese Arbeit will erst einmal geleistet sein.¹³¹
 bases this work wants first once perform-PPP be-INF
 ‘Here it will turn out that [...] it is not only about harvesting brilliance. Rather, success is
 based on hard organisational labour twelve months a year. And such a labour one has yet to
 perform.’

The precise interpretations of these uses of *wollen* are difficult to capture. In (168), *wollen* certainly does not express a volition that is attributed to the subject *der Name des Coiffeurgeschäfts* ‘the name of the hairdresser saloon’. Rather, this use does not encode any volition at all. It can be substituted by the necessity modal verb *müssen* in this environment without significantly altering the interpretation of the clause. Yet, there are some subtle semantic differences that remain to be captured.

Finally, there are obvious raising uses of *wollen* which contribute a meaning that is even more difficult to isolate. These cases appear to occur with verbs like *scheinen* ‘seem’.

¹²⁷DeReKo: NUN90/OKT.01381 Nürnberger Nachrichten, 20.10. 1990.

¹²⁸DeReKo: BRZ09/APR.00836 Braunschweiger Zeitung, 02.04. 2009.

¹²⁹DeReKo: RHZ07/DEZ.22127 Rhein-Zeitung, 27.12. 2007.

¹³⁰DeReKo: M02/SEP.68278 Mannheimer Morgen, 13.09. 2002.

¹³¹DeReKo: P94/SEP.30244 Die Presse, 09.09. 1994.

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- (174) Fast will es scheinen, als müsse „Derevo“ an diesem Freitagabend hoch
almost wants it appear-INF as must Derevo on this friday.night high
über der Stadt das Ende seines Stücks alleine feiern.¹³²
over the city the end it-GEN piece-GEN alone celebrate-INF
'It seems almost as if 'Derevo' will have to celebrate the end of his piece alone high above
the city.'
- (175) Der See wollte heute randlos erscheinen.¹³³
the lake wanted today borderless appear-INF
'The lake appeared to be borderless today.'

As it has been shown, *wollen* occurs in a couple of environments as a raising verb. However, in each of the three cases discussed here, the semantic contribution of *wollen* is rather hard to capture.

Raising directionals with event modification

The negative polar raising use is also attested with verbless directional phrases. The examples (176)–(178) involve inanimate subject referents that are not likely to be identified as a source of volition. Moreover, they share some preferences with the negative polar raising pattern of *wollen*. First of all, it expresses a similar meaning. Secondly, it frequently occurs with the reinforcing adverb *einfach* 'simply' (177) and occasionally, it can be found with a re-duplication of the finite verb (178).

- (176) inzwischen ist es ein Uhr nachts, aber mir will die Geschichte nicht aus dem
meanwhile is it one o'clock night but me wants the story NEG out the
Sinn.¹³⁴
mind
'Meanwhile, it is one o'clock in the morning but the story does not.'
- (177) Ich möchte lernen, aber der Schulstoff will einfach nicht in meinen Kopf!¹³⁵
I want learn-INF but the lesson want simply NEG in my head
'I would like to learn but I do not manage to retain the lesson.'
- (178) Stäheli zittert, bangt, verzweifelt – der Puck will und will nicht ins
Stäheli shivers trembles despairs the puck wants and wants NEG in.the
Tor.¹³⁶
goal
'Strähli shivers, trembles and despairs – the puck does not succeed in hitting the goal.'

¹³²DeReKo: RHZ03/JUL.21748 Rhein-Zeitung, 29.07. 2003.

¹³³DeReKo: WAM/EFP.00000 Walser, Martin: Ein fliehendes Pferd. – Frankfurt a.M., (1978), p. 126].

¹³⁴Fyodor Michaylowich Dostoyewsky, *Der Idiot*, translated by Svetlana Geier, p. 221.

¹³⁵DeReKo: A00/NOV.78588 St. Galler Tagblatt, 15.11. 2000.

¹³⁶DeReKo: A08/MAR.06383 St. Galler Tagblatt, 15.03. 2008.

Control infinitives with clause modification

As has already been observed by Becker (1836, 181), Schoetensack (1856, 294), Curme (1922, 322) and Bech (1949, 6), in some instances, *wollen* refers to a claim attributed to the subject referent. Some authors such as Öhlschläger (1989, 233), Abraham, 11 (2001, 11; 2002, 27; 2005) and Reis (2001, 287 Fn. 1) assume that this use of *wollen* is identified as the epistemic reading of *wollen*.

Indeed, this use of *wollen* shares a couple of the essential characteristics with canonical epistemic modal verbs such as *können* and *müssen*. As soon as *wollen* refers to a claim of the subject referent, it can embed a predication between an identified individual and a predicate that refers to an event in the past (179)–(181) or a predicate that denotes permanent states that cannot be changed (182)–(183). This parallel behaviour has already been pointed out by Abraham (2001, 11; 2005).

- (179) Sieben Packerl Rotwein will er vor dem Prozess konsumiert haben.¹³⁷
 seven packets red.wine wants he before the process consume-PPP have-INF
 ‘He claims to have consumed seven packets of red wine prior to the process.’
- (180) So will sie eine „Depression mit psychotischer Färbung“ bei Pleger
 So wants she a depression with psychotic color at Pleger
 erkannt haben.¹³⁸
 recognise-PPP have
 ‘Accordingly, she claims to have attested a depression with a psychotic imprint in the case of Pleger.’
- (181) Sein Landsmann Frederick Albert Cook will bereits am 21. April 1908 dort
 his countryman Frederick Albert Cook wants already at 21 april 1908 there
 gewesen sein.¹³⁹
 be-PPP be-INF
 ‘His countryman Frederick Albert Cook claims to have already been there on 21th april 1908.’
- (182) Er will angeblich der alleinige Täter sein.¹⁴⁰
 he wants reportedly the sole culprit be-INF
 ‘He claims to be the sole culprit.’
- (183) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die hagere
 Badhapur is a Sadhu, a sage righteous 106 years wants the rawboned
 Gestalt mit dem langen grauen Haar schon alt sein.¹⁴¹
 figure with the long grey hair already old be-INF
 ‘Badhapur is a Sadhu, a wise a righteous man. This rawboned figure, with long grey hair claims to be 106 years old already.’

¹³⁷DeReKo: NON09/JUL.08001 Niederösterreichische Nachrichten, 15.07. 2009.

¹³⁸DeReKo: NON09/JUL.02654 Niederösterreichische Nachrichten, 07.07. 2009.

¹³⁹DeReKo: RHZ06/NOV.30695 Rhein-Zeitung, 30.11. 2006.

¹⁴⁰DeReKo: HMP09/NOV.00548 Hamburger Morgenpost, 05.11. 2009.

¹⁴¹DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23.10. 1999.

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Note that the canonical circumstantial volitional interpretation is not possible in the examples given above. In early descriptions such as Schoetensack (1856, 294), reportative *wollen* has been analysed as a pattern that involves a kind of ellipsis. As he argues in more detail, there is a mediating clause that has been elided: *er will, (dass man glaube), dass er ihn gesehen habe* ‘He wants (that one thinks) that he has seen him’. As Bech (1949, 6) stresses, the canonical volitional use of *wollen* targets the “realisation” of the embedded predication. The uses above, however, target the “reality” of the embedded predication. This contrast corresponds exactly to the one between circumstantial interpretations of *können* or *müssen* and their epistemic counterparts.

In opposition to canonical epistemic modal verbs, the use of *wollen* discussed above is not subject to the CoDeC in the same manner. Some authors, such as Palmer (1986, 72), Schenner (2009), Faller (2010, 661), argue that it merits a different name: quotative or reportative modal verb. Whereas an epistemic modal verb indicates that the modified proposition is not part of the speaker’s knowledge, the proposition that is embedded reportative *wollen* (179)–(183) can be, in principle, part of the speaker’s knowledge, as will be shown in more detail in Section 7. As it will turn out, the relevant attitude holder for the evaluation of reportative *wollen* seems to be the subject referent rather than the speaker. In contrast to epistemic modal verbs, the speaker may agree or disagree with the modified proposition which is labelled as a claim of another referent. He may even know that it is true or false. Similar observations have been made by Öhlschläger (1989, 235), Ehrich (2001, 157), Colomo (2011, 241), Faller (2011, 4) and Faller (2012, 289).

As has been shown in the preceding Sections 4.2.1 and 4.2.2, epistemic modal verbs can be characterised in terms of the environments they are excluded from. Reis (2001, 294, 296) observes that reportative *wollen* occurs more readily in environments in which epistemic modals are rather bad or entirely excluded, such as non-finite environments or in questions.

Thus, there are two aspects in which reportative *wollen* differs from canonical epistemic modal verbs. As it appears, these two aspects might be derived from a major syntactic difference. Whereas epistemic modal verbs are always raising verbs which are evaluated with respect to a super-ordinate attitude holder, which is the speaker in the most typical case, *wollen* remains to be a control verb, even in its quasi-epistemic use, as it has already been stressed by Öhlschläger (1989, 121) and Reis (2001, 302). The crucial difference is that reportative *wollen* introduces the attitude holder as its proper argument. Assuming that each epistemic modal operator contains a variable for the epistemic agent that undertakes the evaluation, the variable for the epistemic agent is always locally bound by the subject referent in the case of reportative *wollen*. Being already instantiated, the variable contributed by the operator is not subject to the strict conditions of identifications any more. Accordingly, the reportative modal verb can be used more flexibly. The precise mechanism of identification will be discussed in Chapter 7.

Finally, reportative *wollen* turns out to be an ideal candidate to check the nature of *wh*-clefts. Thráinsson and Vikner (1995, 62) and Erb (2001, 88) assume that, in *wh*-clefts, control verbs can only be separated from their infinitive complements, whereas raising verbs cannot. According to their view, the subject in the *wh*-clause needs to be licensed by an external theta role. This would explain why epistemic modal verbs are ruled out in such configurations, as they lack an external theta role, being raising verbs.

If their assessment is correct, it is expected that reportative *wollen* could be separated from its infinitive complement in *wh*-clefts, as it is illustrated in (184), which is derived from the corpus example (180):

- (184) ?? Was sie vielmehr will, ist bei Pleger eine „Depression mit psychotischer Färbung“ erkannt (zu) haben.¹⁴²
 what she rather wants is at Pleger a depression with psychotic color recognise-PPP to have-INF
 Intended reading: ‘What she claims is rather that she has attested a depression with a psychotic imprint in the case of Pleger.’

In this example, the licencing conditions are fulfilled. The finite verb in the *wh*-clause assigns a theta role to the subject NP *sie*. Nevertheless, the examples that involve reportative instances of *wollen* seem to be less acceptable than those cases with volitional *wollen* which are discussed in Section 6.8. If Thráinsson and Vikner (1995, 62) and Erb (2001, 88) are right, in that only control verbs can be separated from their infinitive complements, the availability of an external theta role cannot be the sole condition. As it will be shown in Section 6.8, there are alternative explanations.

In some rare cases, the referent to which the claim is attributed can be an argument different to the matrix subject. In example (185), reportative *wollen* embeds the idiomatic pattern *ein Begriff sein* with a dative NP that encodes the EXPERIENCER argument. Crucially, it is the dative NP that bears the most prominent thematic role in this pattern, according to the hierarchy of thematic roles proposed by Dowty (1991). Surprisingly, reportative *wollen* can embed such a type of predicates in which the EXPERIENCER is identified with a dative NP rather than a nominative NP. Nevertheless, the referent to which the claim is attributed is the dative NP *Strasser* rather than the matrix subject *Mensdorff-Pouillys Firma Valurex*.

- (185) Auch Mensdorff-Pouillys Firma Valurex, die in dem
 also Mensdorff-Pouilly-GEN enterprise-NOM Valurex-NOM REL.PRN in the
 Deal als Drehscheibe fungierte, will Strasser bis heute kein
 deal as turning.device functioned wants Strasser-DAT until today no-NOM
 Begriff sein („Valurhops oder wie die heißt“).¹⁴³
 notion-NOM be-INF valurhops or how that called.is
 ‘Strasser claims that Mensdorff-Pouilly’s enterprise ‘Valurex’, which functioned as the key turning point in the deal, was not known to him („Valurhops, or how it is called”).’

This example indicates that the instance of reportative *wollen* cannot be a canonical control verb as the semantic role is evidently not assigned to the matrix subject but to a dative object that depends from the embedded predicate *ein Begriff sein*. Moreover, an interpretation as a non-reportative instance of the raising pattern of *wollen* is not plausible in the example above, in which an accused former minister claims that he was not informed about a certain deal. Yet, it has to be checked what repercussion this example has for the analysis of reportative *wollen*. Possibly, this pattern is not generally accepted. It could turn out that this configuration could be accounted for by the oblique raising analysis illustrated by Gergel and Hartmann (2009, 337). As they assume, *wollen* can discharge its semantic role that is designated to the subject argument alternatively to the dative argument of the embedded infinitive. But as it has been illustrated in Section 4.2.3, their analysis has some shortcomings that have yet to be overcome.

¹⁴³<http://www.orf.at/stories/2126743/2126744/>, accessed on 20th June 2012.

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Note that this example also involves a negative quantifier in subject position. As will be shown in Section 4.2.8, such configurations exhibit a mysterious interaction with reportative control verbs.

Raising infinitives with clause modification

Likewise, there are instances of clause modifying *wollen* that do not seem to involve a referential subject argument. In these uses, it is highly reminiscent of concessive epistemic *mögen*, which is discussed in more detail in Section 4.2.7. As is typical for sentences that involve a modal operator with concessive meaning, the main clauses in (187) and (188) are followed by a clause that is introduced by the adversative conjunction *aber* 'but'.

- (186) Warum hat Schwenker, wenn es tatsächlich so gewesen sein wollte, das nicht
why has Schwenker if it indeed so be-PPP be-INF wanted that NEG
gleich erzählt?¹⁴⁴
immediately told

'If it should have indeed been like that, why hasn't Schwenker immediately told it?'

- (187) Der etwa 69 800 Mark teure Cross Country [...] will zwar kein
the about Mark expensive cross country wants although no
Geländewagen sein, doch in seiner Nähe sehen ihn die Volvo-Leute
all-terrain.vehicle be but in his closeness see him the Volvo-people
schon.¹⁴⁵
yet

'Though the Cross Country, which costs 69 800 Mark, might not be an all terrain vehicle it is considered by the Volvo people as something comparable.'

- (188) Ich will den Arbeitgebern sicher nicht gefallen wollen, aber ich
I want the employer certainly NEG please-INF want-INF but I
möchte in schwierigen Zeiten ein Optimum für die Arbeitenden
would.like.to in difficult periods an optimum for the employees
herausholen.¹⁴⁶
get.out-INF

'Certainly, I might not please the employers but I would like to get the maximum for the employees in such difficult times as now.'

Some speaker prefer to analyse the inanimate subject referent in (187) as an anthropomorphic subject. This analysis would not account for the case where *wollen* selects a non-referential subject in (186), neither for (188) in which *wollen* does not only occur as a matrix verb but also as the infinitive complement. The only plausible interpretation is one that is similar to the one of concessive-epistemic *mögen*. The speaker who utters such a configuration indicates that he

¹⁴⁴DeReKo: HMP09/DEZ.00650 Hamburger Morgenpost, 07.12. 2009.

¹⁴⁵DeReKo: M97/712.03322 Mannheimer Morgen, 10.12. 1997.

¹⁴⁶DeReKo: E98/NOV.28535 Züricher Tagesanzeiger, 07.11. 1998.

acknowledges that the embedded proposition is possible, even if he considers the content of this proposition irrelevant for the ongoing discourse.

At this point, it is important to stress that both verbs *wollen* and *mögen* express in their control structure a volitional meaning. It seems, that parts of these semantic features are still active in the concessive epistemic use. Thus, there are good reasons to acknowledge that *wollen* has an independent use as epistemic raising verb, even if this use is rather marginal. This reasoning is further supported by instances of other volitional verbs such as *sollen* that also exhibit a concessive resonance, such as the example (257) discussed in Section 4.2.6.

4.2.4 dürfen

The case of *dürfen* ‘be.allowed.to’ turns out to be of particular interest. As it will be demonstrated, its indicative use can never be used with an epistemic interpretation, in contrast to all other items that are considered as modal verbs. However, with a subjunctive of the past morphology, an epistemic reading becomes available. As it appears, it is not plausible to subsume the epistemic use of *dürfte* under the use of *dürfen*: Whereas circumstantial *dürfen* involves a modal force that corresponds to a possibility, epistemic *dürfte* cannot be considered as a possibility verb any more, rather it is a verb that expresses a probability. As most authors such as Kratzer (1991, 650) implicitly assume that the modal force for a lexical item always remains the same, *dürfen* and *dürfte* have to be considered as two separate independent lexical items.

In contrast to the previous cases, *dürfen* does not involve transitive uses in Contemporary German, although there are some uses attested from the Early New High German period in which it occurs without an infinitive complement. But, at this point, it is not entirely clear whether these uses are not due to a confusion with the verb *bedürfen* ‘need’. The most important uses of *dürfen* are the permissive uses with bare infinitive complements. As already illustrated in Section 4.1.4, *dürfen* does not occur very frequently.

Transitive Uses

There are a couple of cases occurring in texts from the Early New High German period in which *dürfen* is only combined with a NP. Interestingly, there seems to be a certain flexibility with respect to the case assignment. The examples (191)–(194) are taken from the *Deutsches Wörterbuch* (DWB). As the editor of the respective entry argues, *dürfen* can either select genitive NPs as in (193)–(194) or accusative NPs, as in (191)–(192). This alternation merits closer attention as the four examples stem altogether from the same text.

- (189) Der Oberst meinte/ es were ein betrug dahinder/ vnd sagte/ Sie solten
 the colonel thought it was a deception behind and said they should
 hinfahren/ denn er duerffte der Wahr nicht¹⁴⁷
 away.go because he may-SBJV.PST the-GEN good NEG
 ‘The colonel thought it was a deception and said that they should leave because he did not
 need their goods.’

¹⁴⁷Ulrich Schmid *Neuwe Welt*, 32a, (1567).

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- (190) Aber die buecher seines Gesetzes hette er nicht mit sich gefuehrt/ denn
 but the books his-GEN law-GEN had he NEG with him carried because
 dieweil er auff dem wasser were/ duerffte er jr nicht.¹⁴⁸
 while he on the water was may-SBJV.PST he they-GEN NEG
 ‘But he did not carry along the books of his laws because as long he would travel through
 the sea he did not need them.’
- (191) von art seind sie verderbt, geneigt zu bosheit darumb dürfen sie freund
 of art are they foul inclined to evil therefore may they friends
 die sie unterweisen, ermanen und strafen und von den sunden helfen¹⁴⁹
 REL.PRN them instruct warn and punish and from the sin help
 ‘Their character is foul and inclined to evil, therefore they need friends that instruct, warn,
 punish and help them to refrain from sinning.’
- (192) da darf man wenig salz zû einer schüssel vol¹⁵⁰
 there may one little salt for a bowl full
 ‘A little salt is needed for a entire bowl.’
- (193) es darf wenig uszlegens, jederman weiszt waz es ist¹⁵¹
 it may little interpret-INF.NOUN-GEN everyone knows what it is
 ‘Not much interpretation is required as everyone knows what it is’
- (194) wir dörften wol einer leiteren, sollen wir anders im nach steigen¹⁵²
 we may well a-GEN ladder-GEN shall we further him after step-INF
 ‘We need a ladder if we would like to follow him.’

But crucially, these instances of *dürfen* without an infinitive complement express a meaning that is very different to the one contributed by *dürfen* with an infinitive complement. The transitive examples denote a need and thereby they reflect the original meaning of *dürfen*, as it has been discussed by Fritz (1997, 10) in great detail. In contrast, *dürfen* with an infinitive is negative polar at this period and expresses a permission. As these two meanings essentially differ with respect to their modal force, it is not plausible to assume that they can be subsumed under the same lexicon entry.

Note that there is an etymologically related verb *bedürfen* ‘need’ that selects a genitive NP. It is fairly likely that all the examples discussed above have emerged due to a contamination with *bedürfen* + genitive NP. This would explain the availability of the genitive case in these instances. As for those complements in the occurrences above that are considered as accusative NPs (191)–(193), it is not so clear whether they indeed involve an accusative case. The example (191) is in principle ambiguous, and (193) involves a quantifier that selects a genitive NP.

There is a further argument that disfavours the assumption that the examples above are archaic remnants of the transitive use of *dürfen*. During the Middle High German period, *dürfen* is not

¹⁴⁸Ulrich Schmid *Neuwe Welt*, 9a, (1567).

¹⁴⁹Geiler von Keisersberg, *sünden des munds*, 47a (1518), as cited in the DWB.

¹⁵⁰Geiler von Keisersberg, *sünden des munds*, 53a (1518), as cited in the DWB.

¹⁵¹Geiler von Keisersberg *sünden des munds*, 23a (1518), as cited in the DWB.

¹⁵²Geiler von Keisersberg *sünden des munds*, 86a (1518), as cited in the DWB.

very frequent and dominantly attested as a negative polar item with an infinitive complement, as it has been illustrated by Bech (1951, 14). In the voluminous novels from the late 12th century *Pârzival* and *Iwein*, *dürfen* is only attested with an infinitive complement and negation.

Note that not all of the patterns illustrated above involve genuine transitive configurations. At closer inspection, it turns out that *dürfen* was also possible as an impersonal verb that lacked a referential subject argument (193).

However, there are transitive uses of *dürfen* that frequently occur in processes of first language acquisition. In contrast to the examples given above, *dürfen* in (195) refers to a permission.

- (195) Darf ich ein Eis?
 may I a ice.cream
 ‘Am I allowed to get an ice cream?’

As it is not considered that these uses belong to the grammar of the target language, they will not receive any further attention here.

Even if the examples discussed here cannot be considered as genuine transitive uses of the verb *dürfen*, such uses exist in earlier stages, as Birkmann (1987, 161) indicates.

Raising infinitives with event modification

The most frequent use of *dürfen* is the one in which it selects a bare infinitive complement. In most of these cases, it denotes a permission. Following the tradition put forth by Bech (1949, 18), authors such as Welke (1965, 105) and Öhlschläger (1989, 162) assume that permission is most efficiently defined in terms of volition. In more detail, deontic *dürfen* indicates that the embedded proposition is consistent with the wishes of another referent, the person who grants the permission. As it has been indicated in Section 4.2.1, the precise syntactic status of circumstantial modal verbs with infinitive complements is contested. Exponents of the analysis put forth by Ross (1969, 86) assume that all circumstantial modal verbs are uniformly control predicates. Likewise, Welke (1965, 107) argues that deontic *dürfen* is a two-place predicate. In contrast, the alternative view is based on the assumption that circumstantial modal verbs can be raising verbs as well.

As Öhlschläger (1989, 105) argues, the permissive uses of *dürfen* involve a raising structure. Applying the diagnostics for raising introduced in Section 4.2.1, it turns out that *dürfen* is indeed attested in environments that are only compatible with raising verbs. First of all, it can select non-referential subjects (196)–(199). Apart from that, it can take scope over existentially quantifying subject NPs yielding a *de dicto*-interpretation (200)–(201), which indicates raising according to von Stechow (2003, 203). In both examples, the permission is not tied to an previously identified referent.

- (196) Es darf nicht nur ums Sparen gehen.¹⁵³
 it is.allowed.to NEG about saving go-INF
 ‘It should not be only about saving money.’

¹⁵³DeReKo: HAZ09/FEB.01718 Hannoversche Allgemeine, 10.02. 2009.

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- (197) Nun ist aber alles wieder im Reinen, und es darf gefeiert werden.¹⁵⁴
 now is but everything again in.the pure and it is.allowed.to celebrate-PPP
 PASS.AUX-INF
 ‘Now that everything is sorted out it is again allowed to celebrate.’
- (198) In Deutschland wohnt die Freiheit. Hier darf geraucht werden.¹⁵⁵
 in Germany lives the freedom here may smoke-PPP PASS.AUX-INF
 ‘In Germany, that is where the freedom lives. Here, it is allowed to smoke.’
- (199) Es darf kein Schweigen mehr geben – Schweigen bedeutet Mitschuld¹⁵⁶
 it is.allowed.to no silence more give-INF silence means complicity
 ‘There should not be any silence any more – silence means complicity’
- (200) Einer seiner Sprösslinge darf den Kuchen schneiden, der andere sein Stück aussuchen.¹⁵⁷
 a his-GEN kid-GEN is.allowed.to the cake cut-INF the other his
 piece choose-INF
 ‘One of his kids may cut the cake, the other one may choose his piece.’
- (201) Dabei soll jede Band versuchen, mit maximal drei Titel die Jury zu überzeugen. Einer der Songs darf jedoch noch nicht auf einem existierenden Tonträger sein.¹⁵⁸
 thereby shall each band try with maximally three titles the jury to
 convince-INF a the-GEN song-GEN is.allowed.to but yet on a
 existing sound.carrier be-INF
 ‘In doing so, each band should try to convince the jury presenting no more than three titles. One of the songs must not be released on an existing audio media.’

In both examples (200) and (201), the subject NP could be replaced by a NP that contains a canonical existential quantifier: *ein Sprössling* or *ein Song*. It is not important here whether *ein* is used as an indefinite pronoun or as a numerical determiner, as Carpenter (1998, 87) has demonstrated that a numerical determiner behaves like an ordinary existential quantifier.

Finally, *dürfen* in its permission reading is transparent with respect to voice. If the subject position of *dürfen* was assigned a semantic role and identified as the bearer of the permission, the examples given in (202a) and (202b) would be expected to refer to a distinct state of affairs. In the first case, the permission would be granted to *Reinhold* and, in the second, to the mountain *Nanga Parbat*. However, this is not the interpretation of these examples.

¹⁵⁵DeReKo: RHZ07/JAN.10458 Rhein-Zeitung, 13.01.2007.

¹⁵⁵DeReKo: BRZ06/AUG.12221 Braunschweiger Zeitung, 25.08. 2006.

¹⁵⁶DeReKo: A00/MAI.36865 St. Galler Tagblatt, 27.05. 2000.

¹⁵⁷DeReKo: RHZ02/MAR.16434 Rhein-Zeitung, 23.03. 2002.

¹⁵⁸DeReKo: O94/FEB.15123 Neue Kronen-Zeitung, 19.02. 1994.

- (202) a. Der Reinhold darf den Nanga Parbat ohne Sauerstoffgerät
 the Reinhold is.allowed.to the-ACC Nanga Parbat without oxygen.apparatus
 bezwingen.
 conquer-INF
 ‘It is allowed that Reinhold conquers the Nanga Parbat without oxygen apparatus’
- b. Der Nanga Parbat darf vom Reinhold ohne
 the-NOM Nanga Parbat is.allowed.to by.the Reinhold without
 Sauerstoffgerät bezwungen werden.
 oxygen.apparatus conquer-PPP PASS.AUX-INF
 ‘It is allowed that the Nanga Parbat is conquered by Reinhold without oxygen apparatus’

Having shown that the permissive use of *dürfen* involves a raising pattern, it is now time to take a closer view at the semantic content. How can it be captured? As Kratzer (1981, 40 ff.) suggests, all of the traditional modal verbs in German can be considered as items that involve quantification over possible worlds. Kratzer (1991, 649) argues further that the interpretation of any modal expression in natural languages can be captured by means of three dimensions: MODAL FORCE, MODAL BASE and ORDERING SOURCE. The dimension that is the least difficult to identify is the modal force.

Bech (1949, 18, 38) uses for permissive *dürfen* almost the same semantic description as for the possibility modal verb *können*. Furthermore, Becker (1836, 178) Kratzer (1981, 46) and Öhlschläger (1989, 158, 162) explicitly analyse deontic *darf* as a possibility modal verb. However, none of these authors provide sound empirical evidence for their conclusions.

Nevertheless, there are good reasons to adopt their analyses that treat *dürfen* as some sort of possibility modal verb. First of all, *können* occasionally exhibits a permissive interpretation which is obviously synonymous to *dürfen*, as it has been indicated in Section 4.2.1. Moreover, Levinson (2000, 36) has pointed out that quantifying expressions such as possibility modal adverbs induce scalar implicatures.¹⁵⁹ If a speaker utters that something is possible, this utterance will imply that it is not certain.

- (203) Possibly, there’s life on Mars.
 +> *not certainly*

From this, in turn, it follows that $((\diamond p) \& (\diamond \neg p))$ should always be true in natural spoken language. Accordingly, it is expected that the conjunction of *dürfen* (p) and *dürfen* ($\neg p$) should not result in a contradiction if *dürfen* indeed involves a possibility modal operator. As it turns out, deontic *dürfen* is acceptable in such a configuration without causing a contradiction, irrespective as to for what mood it is inflected indicative (204a) or subjunctive of the past (204b). The diacritic || indicates a intonation break, the underlined constituent bears a high pitch accent.

- (204) a. Sie darf den Anruf entgegennehmen aber sie darf ihn genau
 she is.allowed.to the call answer-INF but she is.allow.to him exactly

¹⁵⁹At this point, I would like to thank Roland Schäfer and Uli Reich for inspiring comments on this diagnostic.

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so gut auch || nicht entgegennehmen.

as well also NEG answer-INF

‘She is allowed to answer the call, but at the same time she is also allowed not to answer it.’

- b. In diesem Falle, dürfte sie den Anruf entgegennehmen aber sie
 in this case is.allowed.to she the call answer-INF but she
 dürfte ihn genau so gut auch || nicht entgegennehmen.
 is.allow.to him exactly as well also NEG answer-INF

‘In this case, she would be allowed to answer the call, but at the same time she would also be allowed not to answer it.’

As these contrasts indicate, circumstantial *dürfen* indeed turns out to be a true possibility modal verb, confirming the estimations undertaken by Bech (1949, 18, 38) and Kratzer (1981, 46).

As it has been observed by Öhlschläger (1989, 186) and Diewald (1999, 232), the indicative of *dürfen* lacks an epistemic interpretation. Such an interpretation can only be yielded with the subjunctive of the past form *dürfte*.

Nevertheless, there are examples of the indicative *dürfen* in which the speaker appears to undertake an epistemic evaluation with respect to the truth of the embedded proposition, cf. (205)–(207):

- (205) Das darf doch nicht wahr sein, dass der letzte grössere Laden im
 this is.allowed.to yet NEG true be-INF that the last big shop in.the
 Dorf Steinach mit über 3000 Einwohnern verschwindet.¹⁶⁰
 village Steinach with over 3000 inhabitants disappears
 ‘I cannot believe that it is true that the last big shop in the village Steinach disappears, where over 3.000 inhabitants live.’

- (206) Alles beginnt mit einem Blumenstrauß und einem Wutanfall. Den
 everything begins with a flower.bouquet and a rage attack
 Blumenstrauß hat Kerstin gepflückt – für ihre Mama. Doch die sieht
 the flower.bouquet has Kerstin for her mum but she sees
 nur ungelenk abgerupfte Narzissen in der Hand ihrer achtjährigen
 only awkwardly ripped daffodils in the hand her-GEN eight.year.old-GEN
 Tochter und fährt aus der Haut: „Das darf ja wohl nicht
 daughter-sc gen and drives out the skin this is.allowed.to PAR maybe NEG
 wahr sein – meine schönsten Gartenblumen, du spinnst wohl!“¹⁶¹
 true be-INF my beautiful-SUP garden.flowers you nuts.be-INF maybe
 ‘Everything started with a bouquet of flowers and a rage attack. The bouquet of flowers has been collected by Kerstin – for her Mum. But she only sees awkwardly ripped daffodils in the hand of her eight year old daughter and loses her temper: “I cannot believe that this is true – the most beautiful flowers of my garden, you are nuts!”’

¹⁶⁰DeReKo: A10/FEB.04341 St. Galler Tagblatt, 15.02. 2010.

¹⁶¹DeReKo: M11/MAI.06511 Mannheimer Morgen, 21.05. 2011.

- (207) Der Norweger kommt trotz Aufwinds nur auf 111,5 Meter hinunter.
 the Norwegian comes in.spite.of updraught-GEN only at 111,5 meters down
 Für seinen Teamkollegen Velta darf das kein Problem sein.¹⁶²
 for his team.colleague Velta is.allowed.to that no problem be-INF
 ‘The Norwegian only jumped 111.5 meters, in spite of an updraught. I cannot imagine that this will be a challenge for his team colleague Velta.’

However, the examples in (205) and (206), differ from well-behaved epistemic modal verbs in a crucial respect. In these cases, the speaker knows that the embedded proposition is actually true. Such a context is not compatible with epistemic operators. A similar observation regarding this use of *dürfen* has been already made by Fritz (1991, 46 Fn.1). The peculiarity of these examples might be due to the circumstance that they do not involve an animate MODAL GOAL. The speaker does not want to believe the modified proposition, he does not permit himself to believe it. In more formal terms: the embedded proposition is not consistent with the wishes of the modal source, which is identified with the speaker.

In a similar manner, the interpretation of *darf* in (207) can be captured in terms of circumstantial modality. Being a well-trained ski jumper, it is not consistent with the wishes of the modal source, which is identified by the trainer. Similar abstract uses of circumstantial *dürfen* are collected by Welke (1965, 107).

As it has been noticed by Öhlschläger (1989, 185), the semantic core of circumstantial *dürfen* and epistemic *dürfte* differ considerably. For the same reason, some authors such as Wurmbrand (2001, 137, 224) consider *dürfte* as an independent lexical item. Further evidence for this perspective will be presented in Section 4.2.5.

Raising directionals with event modification

As with the verbs that have been reviewed in the previous sections, deontic *dürfen* is attested with verbless directional phrases. As it has been pointed out, by Barbiers (1995; 2002, 53) and Szumlakowski-Morodo (2006, 327), an ellipsis account particularly lacks plausibility in the cases in which the verb selects an inanimate NP. Such cases can be found with deontic *dürfen*.

- (208) Wie viel Haar darf weg? Welche Farbe soll es sein?¹⁶³
 how much hair is.allowed.to away what colour should it be-INF
 ‘How much hair am I allowed to cut away? What colour should it be?’
- (209) Außerdem heftete Jost einen Merktzettel dran, was in die Tonne hinein
 moreover put Jost a reminder on.it what in the bin in
 darf und was nicht.¹⁶⁴
 is.allowed.to and what NEG
 ‘Moreover, Jost put a reminder on it indicating what things might be thrown in to that bin and what might not.’

¹⁶² www.laola1.at 4.1. 2012. Live Ticker for the 4-Schanzen-tournee.

¹⁶³ DeReKo: M02/AUG.64829 Mannheimer Morgen, 31.08. 2002.

¹⁶⁴ DeReKo: M98/DEZ.93655 Mannheimer Morgen, 12.12. 1998.

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- (210) Einer darf noch in die WM-Abfahrt, aber wer?¹⁶⁵
a is.allowed still into the world.championship.downhill.race but who
'Someone may still join the downhill race team for the world championship team, but who could it be?'

As the examples (208) and (209) do not contain subjects that can be identified as the bearer of the permission, they are most plausibly to be analysed as raising patterns. In contrast, (210) involves a subject quantifier that takes narrow scope with respect to the modal operator, which is generally held to be a diagnostic for raising.

4.2.5 *dürfte*

As it has been illustrated in the previous section, the subjunctive of the past form *dürfte* can yield an epistemic interpretation. As it turns out, this use of *dürfte* occurs in the very same distributions as the remaining epistemic modal verbs occur. Just as with any other epistemic modal verb, the epistemic use of *dürfte* can embed a predication between an identified individual and a predicate that refers to a state that cannot be changed (211)–(213) or a predicate that refers to an event in the past (214)–(215). A circumstantial interpretation in which *dürfte* is interpreted as the subjunctive of the past of deontic *dürfen* 'be allowed to' is not available in these cases.

- (211) Das erste Bild des Babys dürfte Schätzungen von Paparazzi
the first picture the-GEN Baby-GEN might estimations by paparazzi
zufolge rund fünf Millionen Dollar (vier Millionen Euro) wert sein.¹⁶⁶
according.to about five millions dollar (four millions Euros) worth be-INF
'According to estimations by paparazzi's, the first picture might have a value of about five million Dollars (four Million Euros).'
- (212) Fachleute haben inzwischen auch mit Scannern die Maße dieses
experts have meanwhile also with scanners the measurements the-GEN
neuen Hohlraumes gemessen. Er dürfte 15 mal 13 Meter groß und 48 Meter
new-GEN cavity-GEN measured he might 15 times 13 meters big and 48 meters
tief sein.¹⁶⁷
deep be-INF
'Experts have meanwhile also measured the measurements of the new interstitial volume with scanners. It may be 15 times 13 meters wide and 48 meters deep.'
- (213) Überhaupt hatte der Pudel, er dürfte schätzungsweise neun bis zehn Jahre alt
generally had the poodle he might approximately nine to ten years old
sein, Glück im Unglück.¹⁶⁸
be-INF luck in.the bad.luck
'Generally, the poodle, which might approximately be nine or ten years old, had a blessing in disguise.'

¹⁶⁵DeReKo: K97/FEB.08651 Kleine Zeitung, 04.02. 1997.

¹⁶⁶DeReKo: NUZ06/MAI.02995 Nürnberger Zeitung, 29.05. 2006.

¹⁶⁷DeReKo: NON07/JUN.12389 Niederösterreichische Nachrichten, 20.06. 2007.

¹⁶⁸DeReKo: RHZ06/OKT.11580 Rhein-Zeitung, 13.10. 2006; Pudel einfach über den Zaun geworfen

- (214) Der Mann dürfte im Schlaf gestorben sein, da die Beamten ihn im Bett
 the man might in.the sleep die-PPP be-INF as the officers him in.the bed
 gefunden hatten.¹⁶⁹
 found had
 ‘The man might have died while sleeping, as the officers found him in his bed.’
- (215) Der Wunsch nach Ungestörtheit dürfte schließlich dem Liebespaar auf so
 the wish for privacy might finally the love.couple for such
 tragische Weise das Leben gekostet haben.¹⁷⁰
 tragic manner the live cost-PPP have-INF
 ‘The wish for privacy might have finally caused the death of the lovers, who died in such a
 tragic manner.’

Furthermore, this use of *dürfte* is subject to the CoDeC. In all the examples above, the speaker indicates that the modified proposition is not part of his knowledge. For instance, the author of example (211) could not resume the discourse with an utterance such as ... *and indeed, a newspaper has paid 4.8 million Dollars for that picture.*

It is no trivial matter to identify the precise semantic specification of this use. Some authors conclude that *dürfte* equals the epistemic uses of *können*: Bech (1949, 20, 38) assumes that epistemic *dürfte* has the same modal force as epistemic *können*, Lötscher (1991, 353) argues that epistemic *dürfte* has the same meaning as epistemic *könnte*.

In contrast, Welke (1965, 107) observes that *dürfte* cannot compositionally be analysed. According to his view, it behaves similar to the epistemic use of *können*, but it expresses a higher degree of certainty. This perspective is adopted by Raynaud (1977, 23), Weinrich (1993, 312), Zifonun (1997, 1910), Öhlschläger (1989, 195, 258) and Helbig and Buscha (2001, 121) who argue that epistemic *dürfte* expresses a probability. Likewise, Kratzer (1981, 58) notices that epistemic *dürfte* is hard to gloss. According to her view, the most promising translation is *it is probable that*. In subsequent work, Kratzer (1991, 650) classifies *dürfte* as a weak necessity modal verb. In a similar manner, Becker (1836, 180) and Schoetensack (1856, 297) have already observed that epistemic *dürfte* expresses a logic probability. Both of them assume that this interpretation has been derived from morphologically similar preterite present *turren* ‘dare’. Furthermore, they conclude that the speaker’s evaluation is dependant from the volition of another agent. Likewise, Curme (1922, 319) argues that *dürfte* is used to state that the speaker is pretty sure about validity of the embedded proposition. Finally, Vater (1975, 112) notices that epistemic *dürfte* always involves a weaker type of modal force than epistemic *werden*.

As none of these authors provide sound empirical evidence for their classifications, the semantic behaviour of *dürfte* will receive closer attention in the remainder of this section. As it has been shown in the preceding section, there are a couple of diagnostics that apply to well-behaved possibility modal verbs. Firstly, departing from the hypothesis advocated by Levinson (2000, 36), according to which epistemic possibility operators induce scalar implicatures, Papafragou (2006, 1693) and Kotin (2008, 382) argue that a canonical epistemic possibility operator should not cause a contradiction in a configuration in which the possibility operator is conjoined with

¹⁶⁹DeReKo: BVZ09/OKT.01155 Burgenländische Volkszeitung, 14.10. 2009.

¹⁷⁰DeReKo: NON09/JAN.04467 Niederösterreichische Nachrichten, 12.01. 2009.

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the possibility operator that selects the negated proposition such as: $(\diamond p) \& (\diamond \neg p)$. And indeed, the epistemic possibility verbs *kann* and *könnte* are acceptable in such a configuration, as is illustrated in (216a)–(216b). However, epistemic *dürfte* yields a contradiction in such a context (216c):

- (216) a. Anatol kann den Brief gelesen haben, aber er kann ihn genauso gut
 Anatol can the letter read-PPP have-INF but he can it exactly.as well
 auch || nicht gelesen haben.
 also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- b. Anatol könnte den Brief gelesen haben, aber er könnte ihn
 Anatol can-SBJV.PST the letter read-PPP have-INF but he can-SBJV.PST it
 genauso gut auch || nicht gelesen haben.
 exactly.as well also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- c. # Anatol dürfte den Brief gelesen haben, aber er dürfte ihn
 Anatol may-SBJV.PST the letter read-PPP have-INF but he can-SBJV.PST it
 genauso gut auch || nicht gelesen haben.
 exactly.as well also NEG read-PPP have-INF
 Intended reading: ‘It is more than probable that Anatol has read the letter but it is also
 more than probable that he has not read it.’

As it seems, the most natural prosodic pattern for these configuration is the one in which the focus is on the past participle *gelesen* in the first clause and on the negation in the second clause. The resulting set of alternatives is reminiscent of VERUM-focus. What is under debate is whether *Anatol* has read the letter or not.

Crucially, epistemic *dürfte* behaves significantly different in these configurations than its deontic counterpart which does not cause a contradiction.

At closer inspection, it turns out that *dürfte* does not trigger scalar implicatures at all (216c) under the same prosodic pattern. This is in opposition to the canonical epistemic possibility modal verbs *kann* (216a) and *könnte* (216b) which behave exactly as Levinson (2000, 36) would expect.

- (217) a. Anatol kann den Brief gelesen haben, aber er muss ihn nicht gelesen
 Anatol can the letter read-PPP have-INF but he must it NEG read-PPP
 haben.
 have-INF
 ‘It could be that Anatol has read the letter but it need not be that he has read it.’
- b. Anatol könnte den Brief gelesen haben, aber er muss ihn nicht
 Anatol can-SBJV.PST the letter read-PPP have-INF but he must it NEG
 gelesen haben.
 read-PPP have-INF
 ‘It could be that Anatol has read the letter but it need not be that he has read it.’

- c. # Anatol dürfte den Brief gelesen haben, aber er muss ihn nicht
 Anatol may-SBJV.PST the letter read-PPP have-INF but he must it NEG
 gelesen haben.
 read-PPP have-INF
 Intended reading: 'It is more than probable that Anatol has read the letter but it need not
 be that he has read it.'

It appears that the acceptability of (216c) would increase if the accent was on *dürfte*, but this does not change the fact that there is a clear contrast between the examples with *könnte* and those with *dürfte*. The reason for the incompatibility of epistemic *dürfte* remains mysterious. If it is indeed a verb that expresses a probability, the behaviour in (216c) is unexpected. In this case, the first clause would express that the likelihood that p is true is bigger than 0.5 and the second clause would express that the likelihood for p is smaller 1.0. From a merely logical perspective, this does not yield any contradiction.

The contrasts become more obvious as soon as the order of the conjuncts is changed and the focus targets the modal force of the modal operator.

- (218) a. Anatol muss den Brief nicht gelesen haben, aber er kann ihn gelesen
 Anatol must the letter NEG read-PPP have-INF but he can it read-PPP
 haben.
 have-INF
 'It need not be that Anatol has read the letter but it could be that he has read it.'
- b. Anatol muss den Brief nicht gelesen haben, aber er könnte ihn
 Anatol must the letter NEG read-PPP have-INF but he can-SBJV.PST it
 gelesen haben.
 read-PPP have-INF
 'It need not be that Anatol has read the letter but it could be that he has read it.'
- c. # Anatol muss den Brief nicht gelesen haben, aber er dürfte ihn
 Anatol must the letter NEG read-PPP have-INF but he may-SBJV.PST it
 gelesen haben.
 read-PPP have-INF
 Intended reading: 'It need not be that Anatol has read the letter but it is more than
 probable that he has read it.'

All the examples so far have illustrated, that *dürfte* cannot be considered as a well-behaved epistemic possibility modal verb. However, if *dürfte* were a probability modal verb, as it is often assumed, the contrasts in (217) and (218) would be mysterious.

As it seems, using *dürfte*, the speaker makes a commitment that he considers the embedded proposition as the most likely alternative. But this cannot be the whole story. Obviously, it involves some additional semantic features which prevent the modal force of *dürfte* to be contrasted with epistemic *muss*. This feature may involve some evidential dimension, as is sometimes claimed, but the exact nature of this feature remains to be shown in great detail.

Following the findings made by Huitink (2008), there are epistemic uses that can occur in the scope of a quantifying NP. As it will be shown in Section 6.20, the most productive epistemic

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modal verbs in this configuration are the possibility modal verbs *können* and *könnte*. The universally quantifying NP can clearly bear scope over *können* (219a) and *könnte* (219b), yielding an interpretation in which the culprit could be identified with any person. Such a reading is not available with *dürfte* (219c): in this case, the narrow scope interpretation prevails, referring to an implausible state of affairs in which the culprit is everybody at the same time.

- (219) a. Dieses Schaufenster kann jeder eingeschlagen haben
this shop.window can everybody break-PPP have-INF
'Anybody could have broken this shop window.'
- b. Dieses Schaufenster könnte jeder eingeschlagen haben
this shop.window can-SBJV.PST everybody break-PPP have-INF
'Anybody could have broken this shop window.'
- c. # Dieses Schaufenster dürfte jeder eingeschlagen haben
this shop.window may-SBJV.PST everybody break-PPP have-INF
Intended reading: 'Probably, everybody has broken this shop window.'

The same contrasts arise with the examples inspired by Huitink (2008) and the clauses based on the corpus examples (305) and (307):

- (220) Mindestens drei Männer können der Vater meines Kindes sein.
at.least three men can the father my-GEN child-GEN be-INF
'At least three men could be the father of my child.'
- (221) # Mindestens drei Männer dürften der Vater meines Kindes sein.
at.least three men may the father my-GEN child-GEN be-INF
Intended reading: 'Perhaps, at least three men are the father of my child.'
- (222) Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
as the school the whole day and partially also at later evening accessible
ist, kann jeder die Kopien mitgenommen haben.¹⁷¹
is can everyone the copies with.take-PPP have-INF
'As the school is open during the whole day and sometimes until late in the evening, anyone could have taken the copies.'
- (223) # Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
as the school the whole day and partially also at later evening accessible
ist, dürfte jeder die Kopien mitgenommen haben.
is might everyone the copies with.take-PPP have-INF
Intended reading: 'As the school is open during the whole day and sometimes until late in the evening, everyone has perhaps taken the copies.'

¹⁷¹DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05.06. 1998.

- (224) „Diesen Brief könnte jeder geschrieben haben, es geht in keine politische Richtung“, so Werner Hosiner-Gradwohl.¹⁷²
 this letter could everyone write-PPP have-INF it goes in no political direction so Werner Hosiner-Gradwohl
 ‘“Anyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’
- (225) # „Diesen Brief dürfte jeder geschrieben haben, es geht in keine politische Richtung“, so Werner Hosiner-Gradwohl.
 this letter might everyone write-PPP have-INF it goes in no political direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’

Summing up, it turns out that epistemic *dürfte* does not behave like the prototypical epistemic possibility verbs *können* and *müssen* in quite a lot respects. Thus, it cannot be considered as an epistemic possibility verb. It is obvious that it involves a modal force which is stronger than that. Therefore, the widespread analysis of epistemic *dürfte* as a probability modal verb is more plausible. But, as it has been shown, such an analysis does not capture the semantic behaviour in every detail. The epistemic use of *dürfte* additionally involves a semantic component that yet remains to be identified. Vater (1975, 112) claims that it always contributes an ironical resonance. Whether this is the key to the mysteries described above remains to be seen.

Considering the different uses of modal verbs, it turns out that alternations of the modal force between different uses of a particular verb does hardly ever occur. The only prominent case affects the verb *mögen* and its subjunctive of the past form *möchte*: whereas the former is generally held to involve a modal possibility operator, the latter is by and large synonymous to the volitional verb *wollen* and therefore most plausibly to be analysed as necessity modal verb. Crucially, *möchte* is canonically considered as independent lexical item that has emancipated from its host lexicon entry *mögen*, as it is illustrated in much detail by Öhlschläger (1989, 7), Kiss (1995, 162), Fritz (1997, 103), Diewald (1999, 144), Wurmbrand (2001, 137, 224) and Vater (2010, 103). A more detailed discussion is given in Section 4.2.8.

In a similar fashion, it is reasonable to follow Wurmbrand (2001, 137, 224) who argues that *dürfte* is an independent lexical item. If there is a common semantic core for deontic *dürfen* epistemic *dürfte*, it must be very little, thus negligible. If this is true, any account such as Diewald (1999, 1) and Reis (2001, 287) that defines the class of modal verbs in German in terms of poly-functionality faces a great challenge. If deontic *dürfen* and epistemic *dürfte* cannot be subsumed under one lexicon entry, there are suddenly two mono-functional items in the class of modal verbs.

Finally, it merits closer attention that epistemic *dürfte* occurs in a whole range of environments in which most other epistemic modal verbs are not attested such as information-seeking question and embedded clauses, cf. Section 6.

¹⁷²DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26.09. 2007.

4.2.6 *sollen*

Beginning with Becker (1836, 181), *sollen* is considered as a modal verb that indicates an external volition. In crucial respects, it much resembles the volitional verb *wollen*. This idea has been further proliferated by Bech (1949, 11). On the one hand, its (quasi) deontic use always requires an animate source of modality. In the case of *sollen*, this volitional modal source is not realised as the subject NP, rather it remains syntactically unrealised and implicit. On the other hand, *sollen* obtains a reportative interpretation just under the same conditions as *wollen* does. Moreover, it exhibits an idiosyncratic behaviour with respect to the negation. Apart from this, *sollen* can yield a truly epistemic reading, as soon as it bears the subjunctive of the past morphology. Finally, *sollen* could be used as a transitive verb until the Early New High German period.

Transitive Uses

In earlier stages of German, *sollen* was used as a transitive verb that denoted a debt. The examples DWB provides the following examples Old High German and Middle High German:

- (226) Zuene sculdigon uuarun sihuuelihemo inlihere: ein solta finfhunt
two debtor were anybody-DAT lender-DAT one shall-PST five.hundred
pfenningo, ander solta finzug.¹⁷³
pennies other shall-PST fifty
'A money lender had two debtors: one of them owed him five hundred pennies, the other one fifty.'
- (227) swer im iht sol, der mac wol sorgen¹⁷⁴
whoever him something shall the may well care-INF
'Whoever owes him something might care about that.'

Contributing a very specific semantics, it is reasonable to assume that the transitive use of *sollen* represents the host item out of which the subsequent necessity modal verb developed. A debt is nothing but a very specific necessity. By means of semantic bleaching, a predicate that expresses a debt can easily turn into a predicate that expresses an obligation or a more abstract necessity. According to the DWB (p. 1469), the transitive use of *sollen* has only disappeared in the course of the New High German period.

Denison (1993, 306) provides analogous examples for *shal* in Middle English. Apart from that, a similar situation can be found in French. In contemporary language use, the most canonic necessity verb *devoir* 'must, shall' is still occasionally used as transitive verb that refers to a debt, as it is illustrated in (228):

- (228) Je dois 51 euros à mon épicier.
I shall 51 euros to my greengrocer
'I owe 51 euros to my greengrocer.'

¹⁷³Tatian 138, 9 (830).

¹⁷⁴Walther von der Vogelweide *Frô Welt, ir sult dem wirte sagen* 100, 28 (around 1200).

Even if the transitive use of *sollen* has disappeared in Contemporary German, there are instances that could be considered as transitive-like patterns, but its usage is strictly restricted. The case under discussion here is restricted to *wh*-questions and idiomatic. Interestingly, this pattern is less acceptable with other traditional modal verbs that cannot be used as transitive verbs today such as *dürfen* and *müssen*

- (229) Was soll/²darf/*muss ich denn hier?
 what shall/am.allowed.to/must I PAR here
 ‘What am I supposed to do here?’

As these uses are fairly restricted and highly idiomatic, they will not receive any further attention.

Raising infinitives with event modification

The most frequent use of *sollen* involves a bare infinitive complement and denotes a volition that is attributed to a referent different from the subject referent, as it has already been indicated by Bech (1949, 11), Raynaud (1977, 14), Glas (1984, 45), Öhlschläger (1989, 174) and Fritz (1997, 17). In its meaning, *sollen* is very close to the obligation reading of *müssen*, thus, it is reasonable to consider the two of them as deontic modal verbs. The major difference the specification concerns the specification of the modal source which is less restrictive in the case of *müssen* and always confined to an animate agent which is usually identified in the prior discourse. Authors such as Höhle (1978, 87) suggest that *sollen* even contributes an implicit argument for this bearer of volition. Other more idiosyncratic uses of circumstantial *sollen* are discussed by Welke (1965, 98ff.), Bech (1949, 13ff.) and Glas (1984).

With respect to its argument structure, the precise nature of circumstantial *sollen* is contested just as most circumstantial modal verbs are. On the one hand, there are authors such as Welke (1965, 87) and Abraham (2002, 38) who explicitly assume that circumstantial *sollen* involves a referential subject argument on its own that identifies the person on which the obligation is imposed. On the other hand, there are authors, such as Öhlschläger (1989, 105) and Wurmbrand (2001, 188ff.) that provide evidence that *sollen* involves a raising pattern.

Applying the diagnostics presented in the previous sections, it turns out that circumstantial *sollen* is indeed a raising verb: it is attested with non-referential subjects (230)–(231) and it permits de dicto interpretations of quantifiers in subject position, in which the modal operator bears scope over the quantifier (232)–(233). At this point, it is not important whether *ein* is used as an indefinite pronoun or as a numerical determiner, as Carpenter (1998, 87) has illustrated that numerical determiners behave in the same manner as ordinary existential quantifiers.

- (230) Die Zielsetzung ist für beide Teams klar: Es soll gepunktet werden.¹⁷⁵
 the goal is for both teams clear: it shall score-PPP PASS.AUX-INF
 ‘The goal is evident for both teams: they are supposed to score.’

¹⁷⁵DeReKo: BVZ11/MAI.00930 Burgenländische Volkszeitung, 12.05. 2011.

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- (231) Auch in Salzgitter forderten gestern viele Menschen, dass es nie wieder
 also in Salzgitter demand yesterday many people that it never again
 Krieg geben soll.¹⁷⁶
 war give-INF shall
 ‘In Salzgitter, many people also demanded that there should not be any war any more.’
- (232) Ein Kandidat „von außen“ soll das Gerangel um die Chefredakteursfunktion
 a candidate from outside shall the bully around the chef.editor.function
 im ORF-Landesstudio beenden.¹⁷⁷
 in.the ORF-regional.television.studio terminate-INF
 ‘A candidate from outside shall terminate the bully around the position of the chief editor
 in the regional television of the ORF.’
- (233) „Ein Beamter von dort soll die Reichenau verstärken“, fordert Strigl.¹⁷⁸
 an officer from there shall the Reichenau reinforce-INF demanded Strigl
 ‘ “An officer from down there shall reinforce the department in Reichenau”, demanded
 Strigl’

In a similar manner, circumstantial *sollen* turns out to be transparent with respect to voice. If *sollen* were a control verb, it would be expected that the obligation should always be imposed on the subject argument. Accordingly, the bearer of the obligation should be *der Reinhold* in (234a) and *der Nanga Parbat* in (234b). As the latter is a mountain and therefore no licit bearer of obligation, this interpretation is not plausible for the examples in (234). Instead, both examples refer to the same state of affairs, they only differ with respect to their information structure. The bearer of obligation is not identified by the assignment of a semantic role.

- (234) a. Der Reinhold soll den Nanga Parbat ohne Sauerstoffgerät
 the Reinhold shall the-ACC Nanga Parbat without oxygen.apparatus
 bezwingen.
 conquer
 ‘It is allowed that Reinhold conquers the Nanga Parbat without oxygen apparatus’
- b. Der Nanga Parbat soll vom Reinhold ohne Sauerstoffgerät
 the-NOM Nanga Parbat shall by.the Reinhold without oxygen.apparatus
 bezwungen werden.
 conquer-PRT.PAS PAS.AUX.PST
 ‘It is allowed that the Nanga Parbat is conquered by Reinhold without oxygen apparatus’

As it has been noticed by Bech (1951, 8), Öhlschläger (1989, 91), Fritz (1997, 55), Zifonun (1997, 1903) and Ehrich (2001, 162) circumstantial *sollen* exhibits a peculiar behaviour with respect to the scope of the negation. These authors argue that circumstantial *sollen* seems to prefer a narrow scope interpretation whilst all of the remaining traditional circumstantial modal verbs prefer a wide scope interpretation. Assuming that *sollen* expresses an obligation, the

¹⁷⁶DeReKo: BRZ08/SEP.01065 Braunschweiger Zeitung, 02.09. 2008.

¹⁷⁷DeReKo: K99/SEP.67351 Kleine Zeitung, 09.09. 1999.

¹⁷⁸DeReKo: I97/JUL.27921 Tiroler Tageszeitung, 19.07. 1997.

canonical interpretation of the negation in cases such as (235) is as follows: *it is mandatory not to commit adultery* rather than *it is not mandatory to commit adultery*.

- (235) Du sollst nicht ehebrechen.
 you shall NEG commit.adultery-INF
 ‘Thou shalt not commit adultery.’
- (236) Lola soll ihre Mutter nicht ärgern.
 Lola shall her mother NEG annoy-INF
 ‘Lola shall not annoy her mother.’
- (237) Sie darf ihre Mutter auch || nicht ärgern.
 Lola is.allowed.to her mother also NEG annoy-INF
 ‘Alternatively, Lola is also allowed not to annoy her mother.’
- (238) Sie soll ihre Mutter || nicht ärgern.
 Lola shall her mother NEG annoy-INF
 ‘What Lola shall do is not to annoy her mother.’
- (239) Nicht anrufen soll man auch nicht¹⁷⁹
 NEG call shall one also NEG
 ‘What you should not do either, is not to call.’

However, at closer inspection, the situation turns out to be much more complicated. Even if it is more plausible to interpret the negation in (235) and (236) with a narrow scope with respect to *sollen*, there are a whole range of aspects that would remain unaccounted for under such a perspective.

Firstly, a narrow scope interpretation of a negation that is combined with a circumstantial modal verb only becomes available in German under a marked prosodic pattern, as it has been pointed out by Blühdorn (2012, Sec. 8.5). The negative particle requires a high pitch accent and needs to be set off by an intonational break, as it is demonstrated in (237). This prosodic pattern induces a contrast focus on the negation. The resulting set of alternatives is *{it is allowed that Lola annoys her mother, it is allowed that Lola does not annoy her mother}*. Contrasting the negation, the configuration in (237) presupposes that one of the discourse participants suggested to add the positive proposition *it is allowed that Lola annoys her mother* to the common ground. Some sort of VERUM focus is at work. This is the only way how a negation can occur in the scope of a circumstantial modal verb in German. If the speaker has the choice to utter the logically equivalent alternatives *Lola darf ihre Mutter nicht ärgern* and *Lola muss ihre Mutter nicht ärgern*, he would, in most cases, choose the latter one, as it does not impose as many contextual restrictions as the former one.

Turning to the most typical cases of *sollen* which occurs with a negation (235)–(236), it becomes clear that they behave in a different manner. On the one hand, these patterns involve an unmarked intonation in which the negative particle does not receive a contrastive focus stress. On the other hand, these sentences can be uttered even if the positive proposition such as *Lola*

¹⁷⁹As quoted in Öhlschläger (1989, 91).

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soll ihre Mutter ärgern has not been added to the prior discourse. In order to obtain such an effect, the negative particle requires being stressed such as in (238).

The canonical case of *sollen* with negation exhibits striking similarities to the remaining circumstantial modal verbs which occur in the scope of the negation in the unmarked case. This is on par with the observation made by Öhlschläger (1989, 91) who noticed that *sollen* can occur with two negative particles (239). From this it follows that *sollen* should be possible with a wide scope interpretation, as well.

Moreover, the negative particle can remain in the same clause as *sollen*, in a *wh*-cleft configuration in which the infinitive complement occurs in the other clause, as it is illustrated in (240)–(241). More details on this pattern are discussed in Section 6.8.

- (240) Was wir aber nicht sollten, ist Bürgern vorwerfen, daß sie ihre
 what we but NEG shall-SBJV.PST is citizen blame-INF that they their
 Vergangenheit nicht bewältigt hätten.¹⁸⁰
 past NEG overcome-PPP have-SBJV.PST
 ‘What we should not do is to blame citizens for not having come to terms with their past.’

- (241) Was Kunst aber nicht sollte, ist sich aus der Frage, welche
 what art but NEG shall-SBJV.PST is REFL out the question what
 ästhetischen Mittel angemessen sind, einfach herauszulügen.¹⁸¹
 aesthetic means appropriate are simply out.to.lie-INF
 ‘What art should not do is to avoid the issue which aesthetic means are appropriate.’

How can the contradictory facts concerning the interpretation of *sollen* with respect to a negation be reconciled? As for the interaction of the necessity operator and the negation, a narrow scope interpretation seems to be much more plausible. However, from a syntactic and prosodic perspective, a wide scope interpretation is the more appropriate one.

Assuming that *sollen* involves an external volition, the riddle can be solved without much further ado. Note that for the volitional verbs such as *wollen*, the difference between a wide scope interpretation of a negation and a narrow scope interpretation can be very little: *I do not want that you feel bad* versus *I want that you do not feel bad*. Moreover, a wide scope reading is often re-interpreted as narrow scope reading by means of an implicature (cf. ‘NEG raising’).

Likewise, it is plausible to assume that a negation that takes a wide scope over *sollen* is not interpreted as a negation applied to a necessity $\neg\Box p$ or *it is not necessary that p*. Rather, it interacts with the volitional modal operator. A more appropriate circumscription is: *there is some referent to which it is attributed that he does not want p to happen*. In contrast, deontic *müssen* in the scope of a negation could be translated as: *there is no referent to which it is attributed that he wants p to happen*. As it will be demonstrated in Section 6.10, there are different options as to how a negative operator can interact with modal operators. It does not always need to affect the entire modal operator, occasionally some components are only concerned.

¹⁸⁰DeReKo: RHZ97/FEB.14043 Rhein-Zeitung, 24.02. 1997.

¹⁸¹DeReKo: HAZ08/NOV.04835 Hannoversche Allgemeine, 27.11. 2008.

Raising directionals with event modification

Just as its other circumstantial cognates, *sollen* is frequently attested with verbless directional phrases. As it has been illustrated in Section 4.2.1, patterns with inanimate subjects provide a strong evidence for an underlying raising pattern. Interestingly, *sollen* can be found more frequently in configurations without animate subjects, as compared to the necessity modal verb *müssen*.

- (242) Die „Blechdose“ am Alsteranleger Alte Rabenstraße soll weg.¹⁸²
 the Blechdose at.the Alster.quay Alte Rabenstraße shall away
 ‘The “Blechdose” at the Alster quay Alte Rabenstraße shall disappear.’
- (243) Nicht selten fällt dann aber der Entscheid: das Rad muss weg, ein neues,
 NEG rarely falls then but the decision the bike must away a new
 moderneres soll her.¹⁸³
 modern-COMP shall here
 ‘In much cases, the decision is: the bike has to be scrapped, a new one has to be acquired.’
- (244) Der Dreck der vergangenen Monate soll weg, die Frühlingssonne
 the dirt the-GEN past-GEN month-GEN shall away the spring.sun
 durch klare, streifenfreie Scheiben scheinen.¹⁸⁴
 through clear stain.less windows shine-INF
 ‘The dirt of the past months has to disappear and the spring sun should shine through clear and stainless windows.’
- (245) dieses Stück Demokratie soll nicht weg.¹⁸⁵
 this piece democracy shall NEG away
 ‘This piece of democracy should not disappear.’

Some of these examples reveal interesting patterns. The instance of *sollen* in (245) occurs next to a negation. A theory that assumes that the negation always takes narrow scope with respect to *sollen* would have to account for the precise nature of the element over which it bears scope in the example given above. In example (244), the verbless directional phrase occurs in coordination with an infinitive complement. Following the common assumption, the two conjuncts of a coordination have to be of the same category or ‘rank’, cf. Dougherty (1970, 850, 864), Jackendoff (1977, 51), Gazdar (1981, 157, 173), Schachter (1984, 269) or Pollard and Sag (1994, 202) for discussion. This could be interpreted as a hint that the verbless directional phrase contains a phonologically empty infinitive. But alternatively, one could argue that what is conjoined in (244) are two predicates.

In earlier stages of German, *sollen* could even select a non-referential subject in configurations with verbless directional phrases, as the examples (246)–(247) which have been provided by the DWB illustrate.

¹⁸²DeReKo: HMP05/APR.00259 Hamburger Morgenpost, 16.04. 2005.

¹⁸³DeReKo: A01/MAR.12763 St. Galler Tagblatt, 30.03. 2001.

¹⁸⁴DeReKo: BRZ07/MAR.20931 Braunschweiger Zeitung, 13.03. 2007.

¹⁸⁵DeReKo: Hannoversche Allgemeine, 01.10. 2007.

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- (246) angesehen, wie gar ein geringes leiden es ist, wenn es gleich zum tode
considered how INTN a small suffering it is if EXPL directly to death
oder sterben sollt.¹⁸⁶
or die-INF shall
'Considering the fact of how little you suffer if you are about to die.'
- (247) nun soll es gerade auf Insbruck¹⁸⁷
now shall EXPL straight to Innsbruck
'Now, they want us to go straight to Innsbruck'

But it is important to stress that these instances are not acceptable in contemporary Standard German.

Raising infinitives with clause modification: reportative

Just as *wollen*, its semantic cognate *sollen* can refer to a claim. This has been already observed by Becker (1836, 181), Schoetensack (1856, 295), Curme (1922, 322), Bech (1949, 13). As it has been pointed out above, circumstantial *sollen* can be semantically derived from circumstantial/volitional *wollen*, as it expresses a volition that is attributed to a referent different from the subject referent. In the same manner, reportative *sollen* can be derived from reportative *wollen* referring to a claim that is attributed to a referent different from the subject referent. This has already explicitly been suggested by Schoetensack (1856, 295) who argues that reportative *sollen* involves a kind of ellipsis as well: *dieser Mensch soll gesagt haben – jemand, irgendein Fremder verlangt, dass man glaube, dieser Mensch habe gesagt* 'Somebody wants (that one believes) that this person has said ...'. As with respect to its argument structure, the analysis suggested by Welke (1965, 97) is without opposition; reportative *sollen* is generally held to be a one place predicate. Likewise, Bech (1949, 13) has already observed that canonical volitional *sollen* targets the "realisation" of the embedded predication. The uses above however target the "reality" of the embedded predication. This contrast corresponds exactly to the one between circumstantial interpretations of *können* or *müssen* and their epistemic counterparts.

Similar to *wollen*, *sollen* exhibits a behaviour parallel to epistemic modal verbs in a crucial respect. Whenever *sollen* embeds a predication between an identified individual and a predicate that refers to a state that cannot be changed (248)–(249) or a predicate that refers to an event in the past (250)–(255), a circumstantial interpretation is excluded. The only reading available is the reportative one:

- (248) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl. F.) soll
Tom Cruise and Katie Holmes are shocked L R Hubbard (small picture) shall
Suris Vater sein.¹⁸⁸
Suri-GEN father be-INF
'Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri's father.'

¹⁸⁶Luther, br 4, 257 (ca. 1530) as it is quoted by the DWB.

¹⁸⁷Goethe XXVII, 11; (ca. 1800), as it is quoted by the DWB.

¹⁸⁸DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08.01. 2008.

- (249) So soll das Kokain einen Reinheitsgehalt von 80 bis 90 Prozent besitzen und so shall the cocaine a purity.degree of 80 to 90 percent have and ca. 40 Millionen Euro wert sein.¹⁸⁹
 about 40 million Euro worth be-INF
 ‘According to this, the cocaine is claimed to have a purity degree of around 80 or 90 percent and worth about 40 million Euro.’
- (250) Horst Seehofers Ex-Geliebte Anette Fröhlich (35) soll den CSU-Chef Horst Seehofer-GEN ex-lover Anette Fröhlich (35) shall the CSU-head laut „Bunte” zuletzt in Berlin „regelmäßig und lange” besucht haben.¹⁹⁰
 according.to Bunte recently in Berlin regularly and long visit-PPP have-INF
 ‘According to the “Bunte”, Horst Seehofer’s ex-lover Anette Fröhlich is claimed to have regularly visited the CSU head in Berlin recently and for long periods.’
- (251) Während eines Gottesdienstes soll sie sich einmal an seinem during a church.service shall she REFL once on his Messgewand festgekrallt haben. Im Beichtstuhl soll es sogar zu liturgical.vestment cling-PPP have-INF in.the confessional shall it even to einem „Annäherungsversuch” gekommen sein.¹⁹¹
 a advance come-PPP be-INF
 ‘During a church service she is claimed to have clinged to his liturgical vestment. She is said to have made an advance in the confessional.’
- (252) Im Sommer 2008 soll Kaczynski auf dem Flug in das von Russland bedrängte in summer 2008 shall Kaczynski on the flight to the by Russia harried Georgien mit einem Wutanfall auf die Entscheidung des Piloten reagiert Georgia with a rage.attack on the decision the-GEN pilot react-PPP haben, aus Sicherheitsgründen im benachbarten Aserbaidschan zu landen. have-INF for security.reasons in neighbouring Azerbaijan to land Später hatte er dem Piloten Feigheit vorgeworfen und soll seine Entlassung after had he the pilot cowardice blame-PPP and shall his dismissal erwirkt haben.¹⁹²
 obtain-PPP have-INF
 ‘Reportedly, Kaczynski reacted during the flight to Georgia with a rage attack, having acknowledged the decision of the pilot to land in the neighbouring country Azerbaijan for security reason. It is further claimed that he accused the pilot of being a coward and has obtained his dismissal.’
- (253) Die Schweizer Journalistin Klara Obermüller, bei der Guttenberg in seiner The Swiss journalist Klara Obermüller, from the Guttenberg in this Doktorarbeit abgeschrieben haben soll, findet dieses Verhalten „nicht sehr thesis copy-PPP have-INF shall finds this behavior NEG very

¹⁸⁹DeReKo: NON10/FEB.11326 Niederösterreichische Nachrichten, 17.02. 2010.

¹⁹⁰DeReKo: HMP09/JUN.01135 Hamburger Morgenpost, 14.06. 2009.

¹⁹¹DeReKo: A09/FEB.04884 St. Galler Tagblatt, 18.02. 2009.

¹⁹²www.orf.at, accessed on 27th May 2010.

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ehrenhaft und eigentlich auch nicht sehr klug”.¹⁹³
honourable and actually also NEG very smart

‘The Swiss journalist from whom Guttenberg copied some passages in his thesis considers this behaviour “not very honourable and actually also not very smart”.’

- (254) Nordwestlich von Pjöngjang sollen drei Wildgänse beobachtet
northwest of Pyongyang shall three wild.gooseS observed-PPP
worden sein, die ein Trauergeschrei von sich gegeben hätten
PASS.AUX-PPP be-INF that a grief.howl from REFL give-PPP have-SBJV.PST
und dreimal über eine Statue des verstorbenen Präsidenten geflogen
and three.times above a statue the-GEN deceased-GEN president-GEN fly-PPP
seien.¹⁹⁴
be-SBJV.PRS

‘Reportedly, three wild geese have been observed in the northwest of Pyongyang that were howling in grief and that were flying three times over the statue of the deceased president.’

- (255) Der Thüringer Verfassungsschutz soll laut Medien den Mitgliedern
the Thuringian protection.of.constitution shall according Media the members
des Neonazi-Trios in Zwickau vor elf Jahren 2000 Mark zum
the-GEN Neo-Nazi-Trio-GEN in Zwickau before eleven years 2000 Mark for.the
Kauf gefälschter Pässe gegeben haben.¹⁹⁵
purchase falsified-GEN passport-GEN give-PPP have-INF

‘According to the media, the Thuringian Office for the Protection of the Constitution has supported the members of the Neo-Nazi-Trio in Zwickau eleven years ago with 2000 Mark for the purchase of falsified passports.’

The example (254) is of particular interest, as it exhibits a remarkable interaction of a reportative modal modifier and other grammatical means to qualify a proposition as a claim that has been made by somebody different to the speaker, such as the subjunctive of the present *seien* ‘be-SBJV.PRS’ and the subjunctive of the past *hätten* ‘have-SBJV.PST’. On closer inspection, it turns out that this configuration involves some sort of sequence of modality effect. The proposition of the super-ordinate clause is identified as a claim of somebody else. According to this, the two embedded conjoined relative clauses appear to require a similar specification. For some reason, the author employs the subjunctive of the past *hätten* in the first conjunct and the subjunctive of the present *seien* in the second. If both finite verbs were specified as indicative of the present, the pattern would be significantly less acceptable.

It is important to stress that reportative *sollen* is not restricted to the modification of stative predicates, it is also attested with predicates that denote a process (256).

- (256) Schnaps und Wein mit dem Konterfei Adolf Hitlers auf dem Etikett:
schnapps and whine with the portrait Adolf Hitler-GEN on the label

¹⁹³<http://www.orf.at/stories/2042591/2042574/>, 16th February 2011.

¹⁹⁴<http://www.orf.at/stories/2096125/2096140/>, accessed on 22th December 2011.

¹⁹⁵<http://derstandard.at/1324170159908/Verfassungsschutz-soll-Nazi-Trio-finanziert-haben> 19.12. 2011, accessed on 19th December 2011.

Dafür soll ein Vorarlberger im Internet werben.¹⁹⁶
 therefore soll a Vorarlbergian in.the Internet advertise-INF

‘Reportedly, a Vorarlberger advertised schnapps and wine with a label exhibiting a portrait of Adolf Hitler on the Internet.’

Just as with reportative *wollen*, the reportative use of *sollen* is not subject to the CoDeC to the same extent that epistemic modal verbs are, as it will be pointed out in more detail in Chapter 8. In opposition to epistemic modal verbs, the speaker can agree or disagree with the embedded proposition which is labelled as a claim of another referent. He may even know that it is true or false. Similar observations have been made by Öhlschläger (1989, 235), Ehrich (2001, 157), Colomo (2011, 241), Faller (2011, 4), Faller (2012, 289).

As it has been already illustrated in Section 4.2.1, epistemic modal verbs can be characterised by means of the environments from which they are excluded. As it has been shown by Reis (2001, 294, 296), *sollen* occurs more readily in distributions in which epistemic modal verbs are significantly less acceptable, such as questions or non-finite environments. However, reportative *sollen* turns out to be not as flexible in its behaviour as reportative *wollen*. This may be due to the circumstance that the attitude holder is provided as an implicit argument of a raising verb in the case of *sollen*, whereas, in the case of *wollen*, the attitude holder is encoded in a more salient manner: it is realised as subject argument.

Interestingly, *sollen* appears to involve a concessive resonance in some cases, just as with concessive epistemic *mögen* in Section 4.2.7 and with the instances of *wollen* (186)–(188) discussed in Section 4.2.3. The author of the utterance (257) makes the concession that the embedded proposition can be considered possible.

- (257) Dass Renyi bei einem Blatt arbeitet, das mit dem „Falter“ vergleichbar ist und
 that Renyi at a paper works that with the Falter comparable is and
 schon seit 1991, verstärkt dann ab 1993, gegen „Fidesz“ kampagnisiert –
 already since 1991 intensified then after 1993 against Fidesz campaigns
 soll sein, beweist aber eigentlich nur, dass es um die Pressefreiheit in
 shall be-INF proves but actually only that it about the freedom.of.press in
 Ungarn so schlecht nicht bestellt sein kann.¹⁹⁷
 Hungary so bad NEG tilled be-INF can
 ‘That Renyi works for a newspaper that could be compared to the “Falter” and that cam-
 paigns against “Fidesz” since 1991 and from 1993 onward in a more intensive manner may
 be right. But even if so, this just proves that the freedom of the press cannot be severely
 endangered in Hungary.’

Data such as (257) supports the hypothesis that concessive semantics could be related to volitional meaning. All the epistemic modal verbs that allow for a concessive interpretation *mögen*, *wollen* and *sollen* involve volitional semantics to some extent or another.

¹⁹⁶<http://vorarlberg.orf.at/news/stories/2512078/>, accessed on 6th December 2011.

¹⁹⁷Die Presse, 29.12. 2011.

Raising infinitives with clause modification: epistemic

Apart from its reportative interpretation that refers to a claim attributed to another person, *sollen* can express an assumption undertaken by the speaker if it bears subjunctive of the past morphology. This has been already observed by Becker (1836, 181), Bech (1949, 16), Glas (1984, 104), Öhlschläger (1989, 236 Fn. 223), Scholz (1991, 275 Fn. 114) and Fritz (1997, 107).

Whenever *sollte* selects a predicate that refers to a state that cannot be changed (258) or a predication that refers to an event in the past (259), it is restricted to an epistemic interpretation. Once again, a circumstantial reading is not available in such a configuration.

- (258) Das Software-Problem sollte aber mittlerweile behoben sein, wie
the software-problem shall-SBJ.PST but meanwhile resolve-PPP be-INF as
SBB-Sprecher Jean-Louis Scherz sagte.¹⁹⁸
SBB-spokesman Jean-Louis Scherz said
'The software problem should be resolved by now, as indicated by the SBB-spokesman
Jean Louis Scherz.'
- (259) Der jüngste Erfolg sollte auch das Nervenkostüm seiner Mannschaft
the youngest success shall-SBJ.PST also the nerve.costume his-GEN team-GEN
stabilisiert haben.¹⁹⁹
stabilise-PPP have-INF
'The last success should have also rendered his team a bigger self assurance.'
- (260) Selbstbewusstsein sollte eigentlich auch bei der SG Unnertal in Massen
self.confidence shall-SBJ.PST actually also by the SG Unnertal in masses
vorhanden sein.²⁰⁰
present be-INF
'SG Unnertal should actually have plenty of self confidence.'
- (261) Denn in vierzehn Tagen sollte es mit Kälte und Frost theoretisch
since in fourteen days shall-SBJ.PST it with cold and freeze theoretically
vorbei sein.²⁰¹
over have-INF
'Because, theoretically, in these fourteen days, the cold and the freeze should have already
gone.'

Interestingly, epistemic *sollte* frequently occurs in the environment of two specific speech act adverbs: *eigentlich* 'actually', cf. (260) and *theoretisch* 'theoretically', cf. (261). These preferences could be helpful to identify the exact interpretation of epistemic *sollte*.

First of all, it deserves closer attention as to what conditions cause the shift of the deictic centre. Whereas reportative *sollen* identifies the deictic centre with an implicit argument, epistemic *sollen* links the deictic centre to the speaker referent. Obviously, a similar shift takes place

¹⁹⁸DeReKo: A09/DEZ.04148 St. Galler Tagblatt, 14.12. 2009.

¹⁹⁹DeReKo: BRZ09/MAI.07459 Braunschweiger Zeitung, 16.05. 2009.

²⁰⁰DeReKo: RHZ99/AUG. 20012 Rhein-Zeitung, 28.08. 1999.

²⁰¹DeReKo: O98/MAR.21556 Neue Kronen-Zeitung, 05.03. 1998.

with circumstantial *sollen*. Bearing subjunctive of the past morphology, the source of volition is more likely to be the speaker in the case of *sollte*. In example (262) the referent to which the volition is attributed is the speaker, identical to *Lutz Greiner*. Even if the context is changed, it is more difficult to obtain an interpretation in which the source of volition is identified with another referent.

- (262) Auch Lutz Greiner würde vor allem stören, wenn dort etwas gebaut
 also Lutz Greiner would above all annoy if there something built
 würde. „Man sollte nicht die ganze Landschaft zubetonieren. [...]”²⁰²
 would one should NEG the whole landscape to.concrete-INF
 ‘Lutz Greiner would also be annoyed if something was built there. “One should not cover
 the whole landscape with concrete”’

Moreover, epistemic *sollte* exhibits a semantic peculiarity. As observed by Copley (2006, 11), epistemic *should* in English is only acceptable if it refers to remote evidence. In a scenario in which the speaker sees that the lights are turned on in the guest’s house uttering the sentence (263) would not be appropriate, whereas *must* would be. Copley’s observation can neatly be extended to German epistemic *sollte* (264).

- (263) Our guests should be home by now.
 (264) Unsere Gäste sollten mittlerweile schon zuhause sein.
 Our guests should meanwhile already at.home be-INF
 ‘Our guests should be home by now.’

As Copley (2006, 5) has further pointed out, the speaker can be aware that the proposition embedded by *should* is false. Accordingly, the speaker can resume the discourse in a context such as (263): ... *but they aren’t*. Once again, this equally holds for *sollte* in German. A similar situation obtains for the other epistemic modal verbs that may bear subjunctive of the past morphology, *könnte* ‘can-SBJV.PST’ (cf. Section 4.2.1 and *müsste* ‘must-SBJV.PST’ (cf. Section 4.2.2). In contrast, the instances above are all subject to the CoDeC. Employing *sollte*, the speaker indicates that the embedded proposition is not part of his knowledge.

At the first glance, *sollte* seems to behave in a manner parallel to *dürfte*: both can only be interpreted in an epistemic way if they bear subjunctive morphology. Following the observations made by Bech (1949), one could argue that this could be due to the circumstance that both verbs involve a volitional resonance in their circumstantial interpretation. However, *sollte* and *dürfte* differ with respect to a crucial property. As it has been illustrated in Section 4.2.5, epistemic *dürfte* behaves very opaquely. As a consequence, it cannot compositionally be derived from its circumstantial counterpart. Thus, it has to be considered as an independant lexical item.

Some authors such as Diewald (1999, 202) claim that, in these instances of *sollte*, the speaker does not undertake an epistemic evaluation of the embedded proposition. Her conclusion is based on the evidence that *sollte* cannot be substituted by epistemic *dürfte* without affecting the interpretation of the entire sentence. It is doubtful whether the difference in the interpretation is really the right evidence to support her claim. As it has been showed above, there are many

²⁰²DeReKo: BRZ09/JAN.09361 Braunschweiger Zeitung, 23.01. 2009.

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properties of *sollte* which are much in favour of an analysis of *sollte* as an epistemic modifier and that would be left unaccounted for otherwise. It is not clear, how Diewald would explain that *sollte* is subject to the CoDeC and becomes epistemic just in the same environments as all the other remaining epistemic modal verbs.

4.2.7 mögen

As it has been pointed out by Öhlschläger (1989, 176), *mögen* poses a peculiar case in semantic respect. It involves a whole range of usages which are intricate to capture. First of all, it can be used as a transitive verb, which is the most frequent pattern, it embeds finite *dass*-clauses and it licences *wenn*-clauses. Apart from that, it can be used as a volitional control verb in most varieties only as a negative polar item. Furthermore, a circumstantial raising pattern is hard to attest for *mögen*, there are at best some highly idiosyncratic instances that could be considered as raising verbs. Apart from that, it always exhibits a concessive resonance whenever employed as an epistemic modal verb, its “pure” epistemic possibility reading has almost been lost in the last centuries. Moreover, it has a defective morphological paradigm as its synthetic subjunctive of the past *möchte* has emancipated and has become an independent lexical item which will be discussed in Section 4.2.8. Finally, it merits closer attention that *mögen* is by far the least frequent item among the traditional six modal verbs in contemporary spoken language, as Ruoff (1981) has pointed out, as it has been shown in Section 4.1.4.

The peculiarities of *mögen* can be explained in terms of the diachronic development of the entire group of modal verbs. As it has been illustrated by Bech (1951, 23), Fritz (1997, 9) and Diewald (1999, 392), *mögen* used to be the default possibility modal verb until the Early New High German period, when it came gradually to be replaced by the new possibility modal verb *können*. As a consequence, *mögen* acquired a semantic component: an emotive/volitional feature. As it seems, the uses with an infinitive erode and the more lexical uses with an accusative NP or with finite complement clauses become more important. So it would not be too surprising if *mögen* drops out of the group of the modal verbs in the course of the next centuries.

Transitive uses

Among the traditional six modal verbs, *mögen* is the one with the most evident transitive use. It indicates an affection between an animate subject referent and the referent realised as the direct object in an active clause, as it has been demonstrated by Becker (1836, 180), Öhlschläger (1989, 69), Diewald (1999, 192) and Eisenberg (2004, 96). Just as any transitive verb, *mögen* is attested in passivisations, as it is indicated in (265)–(266).

- (265) Als verwöhnte Zicke wird sie später von niemandem gemocht.²⁰³
as fastidious bitch PASS.AUX she later by nobody like-PPP
'Being a fastidious bitch, she will not attract much affection later on.'

²⁰³DeReKo: M06/FEB.15690 Mannheimer Morgen, 24.02. 2006.

- (266) Als Schriftsteller wird er [Henry de Montherlant] von vielen nicht
 as writer PAS.AUX he-NOM Henry de Montherlant by many
 gemocht, weil er [...] am übersteigerten Männlichkeitsgefühl, dem
 NEG like-PRT.PAS since he at overreaching feeling.of.masculinity the
 sogenannten Machismo, litt.²⁰⁴
 so-called Machismo suffered
 ‘As a writer, Henry de Montherlant is not very popular because he suffered from a over-
 reaching feeling of masculinity, the so-called Machismo.’

As Becker (1836, 180) has pointed out, this pattern already occurs in Luther’s works in the early 16th century. In comparison to the remaining five traditional modal verbs, *mögen* is the one that occurs most often in passives. Nevertheless, it exhibits a morphological anomaly. *mögen* has lost its synthetic subjunctive of the past. Having developed independent semantics, its genuine form *möchte* (268) is always construed with a volitional interpretation. It is not synonymous with the analytic subjunctive of the past (269) anymore. Accordingly, the analytic pattern is the only one that is acceptable in counter-factual environments.

- (267) Chihiro mag Natto.
 Chihiro likes Natto
 ‘Chihiro likes Natto.’
- (268) # Lola möchte Natto, wenn Sie keine Katze wäre.
 Lola like-SBJV.PST Natto if she no cat be-SBJV.PST
 ‘Lola likes to have some Natto, if she was not a cat.’
- (269) Lola würde Natto mögen, wenn Sie keine Katze wäre.
 Lola would Natto like-INF if she no cat be-SBJV.PST
 ‘Lola would like Natto, if she was not a cat.’

In contrast, *möchte* cannot be interpreted as *mögen* in the scope of a counterfactual operator anymore, similar observations have been made by Lötscher (1991, 338, 354).

Dass-clauses

Moreover, *mögen* in its emotive use can embed finite *dass*-clauses. The emotive use of *mögen* presupposes that the proposition expressed by the *dass*-clause is factual. Interestingly, the majority of the occurrences of emotive *mögen* found in the DeReKo corpus origins from newspapers from West Central and North Western regions.²⁰⁵ There are almost no instances from Switzerland and Austria. As most of the occurrences involve 1. person subjects, it can be concluded that this pattern belongs rather to spoken language, as it is illustrated in (270). However, there are rare cases in which the subject bears the feature 3. person, such as (271). The situation for emotive *mögen* in the scope of a negation is similar. Cases with 3. person subjects are rather rare, which are exemplified in (272)–(273).

²⁰⁴DeReKo: O97/APR.41025 Neue Kronen-Zeitung, 20.04. 1997.

²⁰⁵Survey carried out 21st May 2012.

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- (270) Ich mag, dass im Frühling alles blüht.²⁰⁶
 I like that in.the Spring everything blossoms
 ‘I like the fact that in Spring everything is blossoming.’
- (271) Monika Pohl und Susanne Schnaidt mögen, dass Schmuckstücke flexibel sind,
 Monika Pohl and Susanne Schnaidt like that trinkets flexible are
 wie die Ohrhänger aus unbehandeltem, gewachsenen Türkis, die auch
 like the earring of untreated grown Turkey.stone REL.PRN also
 als Kreolen getragen werden können.²⁰⁷
 as Creoles wear-PPP PASS.AUX-INF can
 ‘Monika Pohl and Susanne Schnaidt like the fact that trinkets are flexible such as the earring
 made out of untreated naturally grown Turkey stone which can also be worn as Creole.’
- (272) Michael Schumacher mag nicht, dass ein anderer dafür bezahlt wird, so
 Michael Schumacher likes NEG that a other therefore pay-PPP PASS.AUX so
 auszusehen wie er.²⁰⁸
 to.outlook as he
 ‘Michael Schumacher does not like the fact that there is somebody who is paid just to look
 like him.’
- (273) Die Schlange war wohl ähnlich nervös wie heute, mochte nicht, dass ein
 the snake was maybe similarly nervous as today like NEG that a
 Mitschüler sie am Schwanzende packte.²⁰⁹
 class.mate she at.the tail.end grasped
 ‘The snake had been obviously as nervous as it was today and did not like it that a class
 mate grasped it by its tail.’

Crucially, in all the examples with emotive *mögen* (270)–(273) the embedded proposition is presupposed to be factive. In order to felicitously utter (270), it is required that everything is usually blossoming. These context conditions are very different from those of circumstantial modality. As Ziegeler (2006) has pointed out, in the most canonical case the proposition embedded by a circumstantial modal operator is not true at utterance time.

Apart from the emotive use of *mögen*, there is another one that can embed a finite *dass*-clause with a volitional interpretation. In contrast to the emotive pattern, the proposition of the embedded clause is not presupposed to be factive in the volitional interpretation. In (274), it is not granted that Lang has yet been considered an intellectual. The counter-factive nature of the *dass*-clause in this example becomes obvious by shifting the attention to the consecutive clause: the employment of the subjunctive of the past in the consecutive clause indicates that in the actual world Lang has not yet been called an intellectual.

In opposition to its emotive use, *mögen* in the examples (274)–(276) aims at the realisation of the embedded predication, rather than evaluating an established fact. As it appears, in most

²⁰⁶DeReKo:BRZ07/JUN.01103 Braunschweiger Zeitung, 14.06. 2007.

²⁰⁷DeReKo: M08/MAI.35471 Mannheimer Morgen, 09.05. 2008.

²⁰⁸DeReKo: N00/MAR.14463 Salzburger Nachrichten, 31.03. 2000.

²⁰⁹DeReKo: BRZ06/AUG.04657 Braunschweiger Zeitung, 10.08. 2006.

varieties, the volitional use of *mögen* requires the presence of a negative operator in the clause. At least in Upper East German varieties, volitional *mögen* with *dass*-clauses is even attested without negation, as exemplified in (276).

- (274) Lang mag nicht, dass man ihn einen Intellektuellen nennt. „Das wäre eine
Lang likes NEG that one him a intellectual calls that is-SBJV.PST a
Übertreibung, zu sehr Schublade“; wehrt er ab und fordert, dass man weg
overstatement too much drawer wards he off and demands that one away
kommt von der Unsitte der Show in der Politik.²¹⁰
gets from the bad.habit the-GEN show-GEN in the politics
'Lang does not like that he is considered as intellectual. "This would be an overstatement,
too much pigeonholing" he objects and demands that one should refrain from the bad habit
of making too much show in politics.'
- (275) »Wirklich, du bist gar nicht findig, Roswitha. Und ich mag nicht, daß du
Truly you are INTN NEG resourceful Roswitha and I like NEG that you
dich erkältest, und alles um nichts.«²¹¹
REFL catch.a.cold and everything for nothing.
'Truly, you are not very resourceful, Roswitha. And I do not want that you catch a cold and
all that would be for nothing.'
- (276) Verdammt, ich mag, dass du wieder in Wien bist! Komm vorbei – du bist bei
Damn I like that you again in Vienna are come along you are at
uns herzlichst willkommen!!²¹²
us cordially welcome
'I wish you were back in Vienna! Come along – you are always cordially welcome!'

As it appears, the negative polarity of volitional *mögen* with *dass*-clause is tied to its particular volitional semantics. As it will be indicated in more detail, volitional *mögen* with bare infinitive complement exhibits the same preference for negative environments.

wenn-clauses

Among the traditional six modal verbs, *mögen* is the only one that occurs with *wenn*-clauses. As Fabricius-Hansen (1980, 162) and Kaiaty (2010, 305) indicate, it is no trivial matter to determine the syntactic status of these clauses. They involve both properties of complement clauses and properties of adverbial clauses. On the one hand, Fabricius-Hansen (1980, 164) and Kaiaty (2010, 288) illustrate that this precise type of *wenn*-clause is restricted to a particular class of matrix predicates. On the other hand, Fabricius-Hansen (1980, 163) and Kaiaty (2010, 289) show that these *wenn*-clauses require the presence of a correlate that saturates the relevant argument position of the matrix predicate in the canonical case. Being a preference predicate, emotive *mögen* is expected to occur with *wenn*-clauses, as Kaiaty (2010, 293) argues. It is indeed attested in the DeReKo corpus.

²¹⁰DeReKo: RHZ04/JUN.08194 Rhein-Zeitung, 08.06. 2004.

²¹¹Theodor Fontane, *Effi Briest* Chapter 21. (1896).

²¹²de-de.facebook.com/MeinOlliSchulz/posts/10150584251049316, accessed on 21st May 2012.

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- (277) ich kann nicht sagen, daß sie es nicht mochte, wenn Oskar ihr darunter
I can NEG say-INF that she it-COR NEG liked if Oskar her underneath
saß.²¹³
sat
'I cannot deny that she did not liked it when Oskar sat underneath her.'

Fabricius-Hansen (1980, 185) and Kaiaty (2010, 305) argue that the type of *wenn*-clause under discussion has to be considered as adverbial clause. The position of the THEME argument provided by *mögen* is typically saturated by the correlate *es*, such as in example (277). The function of the *wenn*-clause in turn is to make the state of affairs the correlate relates to explicit.

However, there are also instances of *mögen* with *wenn*-clauses that do not overtly select a correlate, such as (278) and (279).

- (278) Menotti hat nie gemocht, wenn einer hohe Flanken schlug.²¹⁴
Menotti had never liked when someone high crosses made
'Menotti never liked it when someone played high crosses.'
- (279) Er mag, wenn es einem scheinbar Schwachen gelingt, sich gegen Stärkere
he likes when it a putatively weak.one manages refl against stronger
durchzusetzen.²¹⁵
prevail
'He likes it when a putatively weak person manages to prevail against a stronger one.'

Essentially, there is a main difference between *wenn*-clauses and *dass*-clauses that are embedded under emotive *mögen*: whereas a *dass*-clause always refers to a factive proposition, the proposition expressed by a *wenn*-clause does not need to be factive, as Kaiaty (2010, 295) has pointed out. Rather, it receives a future oriented or conditional interpretation.

Under very restricted conditions, volitional verbs such as *wollen* can also select correlates that refer to a proposition which is made explicit by a *wenn*-clause.

- (280) Er will die inhaltliche Diskussion. Was er nicht will, ist, wenn daraus
he wants the content-ADJ discussion what he NEG wants is when out.of.it
sozusagen Seilschaften gebildet oder Grabenkämpfe gemacht werden.²¹⁶
so.to.speak rope.teams form-PPP or trench.warfare make-PPP PASS.AUX-INF
'He wants a discussion about the content. What he does not want is if this turns into insider relationships or partisanship.'

In example (280), *will* occurs in the scope of a negation and it is part of a *wh*-cleft. Crucially, in all the examples discussed above (277)–(279), *mögen* cannot be replaced by *wollen*.

²¹³DeReKo: MK1/LGB.00000 Grass, Günter: Die Blechtrommel, (1962).

²¹⁴DeReKo: E98/JUN.15928 Zürcher Tagesanzeiger, 29.06. 1998.

²¹⁵DeReKo: HMP08/DEZ.00738 Hamburger Morgenpost, 08.12. 2008.

²¹⁶DeReKo: RHZ07/SEP.04038 Rhein-Zeitung, 05.09. 2007.

Control infinitives with event modification

As it has been pointed out by Welke (1965, 115), Öhlschläger (1989, 179) and Weinrich (1993, 307), *mögen* can be combined with a bare infinitive complement, yielding a volitional interpretation. Further, Welke (1965, 115) and Weinrich (1993, 307) notice that the volitional interpretation is apparently restricted to environments in which *mögen* occurs in the scope of a negative operator, as the examples (281)–(282) indicate. However, in some varieties it can be used without a negation, as shown in (283)–(284). The precise meaning of volitional *mögen* is difficult to capture, yet it seems to be similar to the one of volitional *wollen*. In most of the examples below, *mögen* can be substituted by *wollen* without drastically affecting the overall meaning. In opposition to its volitional counterparts, volitional *mögen* with an infinitive occurs less frequently, by far, at least in written language.

- (281) Über Geld mag er nicht reden.²¹⁷
 About money likes he NEG talk-INF
 ‘He does not want to talk about money.’
- (282) Stefan Müller, Abgeordneter aus Erlangen und einflussreicher Chef der
 Stefan Müller depute from Erlangen and influential boss the-GEN
 Jungen Union, mag die Krise der CSU erst gar nicht
 Junge-GEN Union-GEN wants the crisis the-GEN CSU only INTN NEG
 kleinreden.²¹⁸
 play.down-INF
 ‘Stefan Müller, depute from Erlangen and influential boss of the Junge Union does not want to play down the crisis of the CSU.’
- (283) „Doch, er ist der erste Mann, mit dem ich richtig gerne zusammenleben
 yes he is the first man with that I truly willingly together.live-INF
 mag, eben weil wir uns Freiräume lassen“, sagt die schöne Habermann.²¹⁹
 like just because we us free.space leave says the beautiful Habermann
 ‘Oh yes, he is the first Mann with whom I really would like to live together, just because we allow us room for ourselves.’
- (284) Zoë ist ihre kleine Cousine. „Ich mag den aber anziehen“, beharrt sie und
 Zoë is her small cousin I like this but put.on-INF insists she and
 schlüpft ruckzuck in das Teil.²²⁰
 like.a.shot in the piece
 ‘Zoë is her small cousin “But I want to put on this” she insists and slips into the piece.’

It merits closer attention that behaviour of volitional *mögen* with an infinitive reflects the one of its volitional counterpart with *dass*-clauses: in Standard German, they are more readily acceptable if they occur in the scope of a negation. This indicates that the negative polarity appears

²¹⁷DeReKo: HMP09/MAR.02623 Hamburger Morgenpost, 25.03. 2009.

²¹⁸DeReKo: NUN09/JAN.01879 Nürnberger Nachrichten, 04.04. 2008.

²¹⁹DeReKo: HMP09/AUG.01928 Hamburger Morgenpost, 19.08. 2009.

²²⁰DeReKo: RHZ06/NOV.17231 Rhein-Zeitung, 18.11. 2006.

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to be tied to the volitional semantics of *mögen*. Interestingly, negative polarity is a behaviour that occurs fairly frequently with so-called modal verbs. As it has been shown by Fritz (1997, 54), there are at least three modal verbs in German that displayed a negative polar behaviour over the course of the last centuries: volitional *mögen*, *brauchen*, which will be discussed in Section 4.2.9, are still to be considered as negative polarity items in contemporary Standard German. Moreover, Bech (1951, 14) observes that *dürfen* used to be a negative polarity item until the course of the 16th century. In addition to these instances, there is still a raising pattern of *wollen* that is negative polar, as is illustrated in Section 4.2.3.

Crucially, *mögen* with a bare infinitive complement ceased to express any type of circumstantial possibility like it did until the Early New High German period: In Contemporary Standard German, it cannot refer to a physical ability or to a practical possibility anymore. Bech (1951, 23), Fritz (1997, 9) and Diewald (1999, 392) argue that this drastic shift in the meaning was presumably due to the rise of another possibility modal verb *können*, which was still used rather infrequently in the Middle High German period. As soon as *mögen* has acquired the volitional feature, all the circumstantial possibility readings presumably ceased to exist.

Finally, Welke (1965, 114) has pointed out that *mögen* can be part of some idiomatic expressions, such as *leiden mögen* ‘like’.

Control directionals with event modification

Just as all the other circumstantial modal verbs described in this section do, volitional *mögen* can select verbless directional phrases, as exemplified in (285)–(286). The semantic behaviour is parallel to the one of *mögen* with a bare infinitive complement.

- (285) „Mein Sohn Julian mag nicht mehr in den Kindergarten”, sagt etwa Nina
my son Julian likes NEG more in the kindergarten says for.instance Nina
Islitzer²²¹
Islitzer
‘ “My son Julian does not like to go to the kindergarten any more” says Nina Islitzer for instance.’
- (286) Wer dann nicht mehr zurück in die Stadt mag: Es gibt Hotelzimmer im
who then NEG more back in the town wants it gives hotel.rooms in.the
„Eichbaum”.²²²
Eichbaum
‘Whoever does not want to return to the city, there are rooms available at the “Eichbaum” ’

Similar to the other volitional uses of *mögen* with a bare infinitive complement and with *dass*-clause, *mögen* with a verbless directional phrase is restricted to negative polarity context in Standard German. In some varieties, *mögen* with a directional phrase can occur in positive environments as well, such as East Upper German.

²²¹DeReKo: NON09/SEP.18165 Niederösterreichische Nachrichten, 29.09. 2009.

²²²DeReKo:HMP06/JUL.02708 Hamburger Morgenpost, 27.07. 2006.

Raising infinitives with event modification

In Contemporary German, raising patterns of *mögen* with a circumstantial interpretation appear to be extinguished. However, there are some archaic uses that come into account for a raising analysis. Schoetensack (1856, 294) observes that *mögen* can refer to a volition attributed to a third party, as in is illustrated in (287).

- (287) Er möge hereinkommen.²²³
 he likes-SBJV.PRS enter-INF
 ‘May he enter!/I allow/want him to enter.’

Crucially, there is no thematic relation between *mögen* and its syntactic subject in example (287). Thus, *mögen* does not involve a subject argument in the example given above. Rather, *möge* expresses that the embedded proposition is consistent with the wishes of the speaker. In this point, it is reminiscent of the raising use of *wollen* discussed in Section 4.2.3.

Raising infinitives with clause modification

The epistemic uses of *mögen* are fairly peculiar and very complicated to capture. Moreover, Öhlschläger (1989, 187) observes that it occurs very rarely and that it involves an interpretation that is very different from its circumstantial counterpart. As it appears, there are a couple of different patterns that have to be distinguished. As it has been pointed out by Becker (1836, 180), Bech (1949, 23), Welke (1965, 110), Allard (1975, 88), Öhlschläger (1989, 187 Fn. 121), Fritz (1991, 48), Weinrich (1993, 314) and Diewald (1999, 236), epistemic *mögen* usually conveys a concessive resonance and behaves in a marked manner.

Like all of the remaining modal verbs, *mögen* is restricted to an epistemic interpretation in two particular contexts: whenever it embeds a predication between an identified individual and a predicate that denotes a state that cannot be changed (288)–(290), any circumstantial interpretation is excluded. Likewise, *mögen* can only be interpreted in an epistemic manner whenever it embeds a predication that refers to an event in the past (291)–(294).

- (288) Mit 8 Milliarden Euro Kosten mag Nabucco teuer sein – sie wird sich
 with 8 billion Euro costs may Nabucco expensive be she will REFL
 bezahlt machen.²²⁴
 pay-PPP make-INF
 ‘With its costs of around 8 billion Euros, Nabucco may be expensive – nevertheless, it will pay off.’
- (289) Candye Kane mag hundert Kilo schwer sein, ist bei Gott keine klassische
 Candye Kane may hundred Kilo heavy be-INF is by God no classical
 Schönheit und spielt nostalgischen Blues. Dennoch verfällt man dieser
 beauty and plays nostalgic blues nevertheless one addicts this
 Frau: Sie ist auf der Bühne, um musikalisch zu heilen.²²⁵
 woman she is on the stage in.order musically to heal-INF

²²³Example as quoted by Schoetensack (1856, 294).

²²⁴DeReKo: NON09/JUL.05420 Niederösterreichische Nachrichten, 13.07. 2009.

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‘Candy Kane may weigh 100 kilos, she is by no means a classical beauty, and she plays nostalgic blues. Nevertheless, one addicts to this woman: she is on stage to heal with music.’

- (290) Das Mädchen mag erst drei Jahre alt sein. Doch aufmerksamer war wohl
 the girl may just three years old be-INF but attentive-COMP was maybe
 noch nie ein Buspassagier. Kaum wird nämlich die Haltestelle
 still never a bus.passenger as.soon.as namely PASS.AUX the stop
 »Singenberg« angesagt, da beginnt das Mädchen auch prompt zu
 Singenberg announce-PPP there begins the girl also immediately to
 singen: Singenberg, Singenberg, Singenberg ... – angepasst der Melodie von
 sing-INF Singenberg, Singenberg, Singenberg adapted the melody of
 Hänschen klein.²²⁶

Hänschen klein

‘The girl may be just three years old. But no passenger of the bus has ever been more attentive. As soon as the stop »Singenberg« is announced, the girls immediately starts to sing: Singenberg, Singenberg, Singenberg ... –’ adapting the melody of Hänschen klein.’

- (291) Feminismus mag in der modernen Gesellschaft wirklich etwas Wichtiges
 Feminismus may in the modern society indeed something important
 bewirkt haben, aber braucht man diese Bewegung auch in der Kirche?²²⁷
 cause-PPP have-INF but needs one this movement also in the church?
 ‘Even if Feminism may have caused important changes in the modern society, is it a necessary movement also in the church?’

- (292) Dieser Satz mag im Affekt gefallen sein, doch empfinde ich ihn als
 this sentence may in.the affect fall-PPP be-INF but perceive I it as
 symptomatisch für unsere Zeit.²²⁸
 symptomatic for our time
 ‘This sentence may have been uttered in the heat of the moment, nevertheless I consider it as symptomatic for our time.’

- (293) Das ist psychologisch einfach zu erklären. Diese Kreditvorlage, so gut sie
 that is psychologically simply to explain this credit.approval so well it
 gemeint sein mag, kommt zum falschen Zeitpunkt.²²⁹
 mean- be-INF may comes at.the false moment
 ‘This can be accounted for in terms of psychology. This credit approval arrives in the wrong moment, even if it was well meant.’

- (294) Sein Äußeres mag sich verändert haben, seinen Idealen ist Carlo
 his appearance may REFL change-PPP have-INF his ideals is Carlo

²²⁵DeReKo: A07/OKT.07573 St. Galler Tagblatt, 17.10. 2007.

²²⁶DeReKo: A00/JAN.03266 St. Galler Tagblatt, 15.01. 2000.

²²⁷DeReKo: RHZ09/MAI.08761 Rhein-Zeitung, 11.05. 2009.

²²⁸DeReKo: HAZ08/AUG.05647 Hannoversche Allgemeine, 28.08. 2008.

²²⁹DeReKo:00/AUG.51643 St. Galler Tagblatt, 04.08. 2000.

Acquistapace treu geblieben.²³⁰

Acquistapace loyal stay-PPP

‘His appearance may have changed, but as regards his ideals, Carlo Acquistapace remained true to them.’

The semantic contribution of concessive epistemic *mögen* is intricate to capture. A speaker that utters a proposition *p* in the scope of an concessive epistemic *mögen* implicitly makes a whole range of statements about *p*: First of all, he indicates that there is another referent that believes *p* to be true. Secondly, the speaker himself did not believe *p* to be true. Thirdly, by uttering the sentence *mögen(p)*, he conveys that he changed his mind and considers *p* to be possible and consistent with his own knowledge. Fourthly, the speaker stresses that the fact that *p* is possibly true is irrelevant for the discourse. At this point, it is not evident how these different aspects of the interpretation of concessive epistemic *mögen* can be described in a more systematic and principled manner.

Thus, the concessive epistemic use of *mögen* appears to make reference to an external referent to which an epistemic state is attributed. In this property, it resembles much the quotative use of *sollen*, but also the raising use of *wollen* that ascribes a volition to a third referent, as it has been shown in Section 4.2.3. Interestingly, both verbs *sollen* and *wollen* seem to occur with a concessive epistemic interpretation as well, as pointed out in the respective sections.

It is not evident as to which extent this concessive epistemic use is subject to the CoDeC. Assuming that the deictic centre is identified with the speaker, the modified proposition should not be part of the knowledge of the speaker. It is not completely ruled out that the author of the utterance in (294) is actually aware that Acquistapace’s appearance has changed. Accordingly, the concessive use would drastically differ from the remaining epistemic modal verbs. For similar reasons, some authors such as Öhlschläger (1989, 187) argue that it is doubtful whether concessive *mögen* can be considered as an epistemic modal at all. However, it is not entirely clear whether the speaker in (294) is willing to accept unrestrainedly that the modified proposition (*Acquistapace’s appearance has changed*) is true. Certainly, this proposition is not part of the strongest conviction of the speaker. As a consequence, concessive epistemic *mögen* could act as an existential quantifier over possible worlds: There is at least one world in the modal base in which the proposition is true and this world is a world that is not very favourable for the speaker. But it is favourable for a third party. This ranking could be expressed by an ordering source, in the manner of Kratzer (1981, 1991). Accordingly, concessive epistemic *mögen* could be considered as a specialised possibility verb.

Alternatively, one could apply the CoDeC to the external referent. In that case, the speaker would state that he would not attribute the modified proposition to the knowledge of the referent. Accordingly, he would claim that the external referent cannot really know that *p* is the case.

It merits closer attention that the English counterpart of *mögen* can occasionally be interpreted with a concessive epistemic interpretation. This has already been observed by Leech (1971, 69) who gives the following example:

(295) She may not be pretty but at least she knows her job.

²³⁰DeReKo: RHZ09/AUG.18314 Rhein-Zeitung, 22.08. 2009.

²³⁰Example as quoted in Leech (1971, 69).

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Apart from the concessive epistemic interpretation, *mögen* is attested with an interpretation in which it refers to a more neutral assumption. Welke (1965, 112), Allard (1975, 89) and Diewald (1999, 236) illustrate that it can sometimes be interpreted with a pure epistemic possibility interpretation. As Welke (1965, 112) observes in his corpus study, the concessive resonance of epistemic *mögen* is often absent in fictional texts. In these instances, it denotes a pure assumption. In the corpus composed by Allard (1975, 89), the pure possibility interpretation prevails. The frequencies of the different interpretation are as follows: 50,64 % possibility; 18,23 % concessive; 5,58 % transition between possibility and concessive interpretation – the remaining percentage covers the non-epistemic instances of *mögen*.

Once again, in certain distributions, *mögen* cannot be interpreted in a circumstantial manner. If it embeds a predication between an identified individual and a state that cannot be changed (296)–(297), *mögen* is restricted to an epistemic interpretation. Likewise, *mögen* can only be construed with an epistemic interpretation, as soon as it embeds a predication that refers to an event in the past (298). In the contexts below, the epistemic interpretation lacks the concessive resonance. Interestingly, ‘pure’ epistemic *mögen* is frequently attested with the idiomatic expression *zu tun haben* ‘to have to do with, to be related to’.

- (296) Wann das Kapellchen eigentlich gebaut wurde, kann niemand mehr so genau
when the chapel actually built was can nobody more so precise
sagen, es mag an die 100 Jahre alt sein.²³¹
tell-INF it may on the 100 years old be-INF
‘Nobody can tell anymore when the chapel has been built, it may be about 100 years old.’
- (297) Dass Mozart auf dem Programm steht, mag gewiss mit dem fast schon
that Mozart at the program stands may certainly with the almost already
inflationär gefeierten 250. Geburtstag des Komponisten zu tun
inflationarily celebrated 250 birthday the-GEN composer-GEN to do-INF
haben.²³²
have-INF
‘It may be certainly have something to do with Mozart’s 250th birthday which is almost
celebrated in a too extensive manner.’
- (298) 10 Uhr: Die Funkerin Margarete Wolter erwachte nach totenähnlichem
10 o’ clock the radio.operator Margarete Wolter awoke after dead.like
Schlaf am anderen Morgen – es mag so gegen zehn Uhr gewesen sein.²³³
sleep at.the other morning it may so around ten o’ clock be-INF be-INF
‘10 o’clock: the radio operator Margarete Wolter awoke the other morning from a death-like
sleep – it may have been around ten o’ clock.’

The precise semantic contribution of this epistemic use of *mögen* illustrated above is not obvious: whereas Welke (1965, 110) and Zifonun (1997, 1894, 1910) conclude that epistemic *mögen* is synonymous to epistemic *können* and therefore to be treated as an epistemic possibility

²³¹DeReKo: RHZ09/AUG.12239 Rhein-Zeitung, 15.08. 2009.

²³²DeReKo: NUZ06/FEB.03098 Nürnberger Zeitung, 27.02. 2006.

²³³DeReKo: BRZ05/OKT.19297 Braunschweiger Zeitung, 21.10. 2005.

verb with equal rights, Fritz (1997, 94) assumes on rather intuitive grounds that epistemic *mögen* refers to a possibility that is weaker than the one expressed by epistemic *können*.

However, the replacement test indicates a different picture. In (296)–(298), the epistemic uses of *mag* can neither be substituted by epistemic *kann* or by epistemic *könnte* without affecting the interpretation. Interestingly, a replacement would decrease the degree of commitment to the truth, contradicting Fritz (1997, 94) and Zifonun (1997, 1894, 1910). Surprisingly, the most appropriate substitute would be *dürfte*, which has been identified as an epistemic modal verb that refers to an epistemic probability in Section 4.2.5. The assumption that epistemic *mögen* involves a modal force that is stronger than a possibility is further confirmed by the occurrence of the sentence adverb *gewiss* ‘certain’ in (297) which is usually analysed as an epistemic necessity adverb.

It merits further attention that epistemic *mögen* behaves like *dürfte* in other respects as well. Above all, it cannot be classified as a well-behaved possibility modal verb, as it fails all of the relevant tests, just as it has been shown with *dürfte* in Section 4.2.5.

According to Levinson (2000, 36), epistemic possibility operators induce scalar implicatures. In correspondence, a canonical epistemic possibility operator should not cause a contradiction in a configuration in which the possibility operator that takes scope over a proposition is conjoined with the possibility operator that selects the negated proposition such as: $(\diamond p) \& (\diamond \neg p)$. And indeed, the epistemic possibility verbs *kann* and *könnte* are acceptable in these patterns: (299a)–(299b). Similar observations have been made by Papafragou (2006, 1693) and Kotin (2008, 382). In contrast, epistemic *mögen* yields a contradiction in this environment (299c):

- (299) a. Anatol kann den Brief gelesen haben, aber er kann ihn genauso gut
Anatol can the letter read-PPP have-INF but he can it exactly.as well
auch || nicht gelesen haben.
also NEG read-PPP have-INF
‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- b. Anatol könnte den Brief gelesen haben, aber er könnte ihn
Anatol can-SBJV.PST the letter read-PPP have-INF but he can-SBJV.PST it
genauso gut auch || nicht gelesen haben.
exactly.as well also NEG read-PPP have-INF
‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- c. # Anatol mag den Brief gelesen haben, aber er mag ihn genauso gut auch
Anatol may the letter read-PPP have-INF but he may it exactly.as well also
|| nicht gelesen haben.
NEG read-PPP have-INF
Intended reading: ‘It is possible that Anatol has read the letter but it is also more than possible that he has not read it.’

As it turns out epistemic *mögen* does not seem to trigger scalar implicatures at all (300) under the same prosodic pattern. For some reason, epistemic *mögen* (300c) is less acceptable in this configuration than the canonical epistemic possibility modal verbs *kann* (300a) and *könnte* (300b), which behave exactly in the manner as Levinson (2000, 36) predicts.

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- (300) a. Anatol kann den Brief gelesen haben, aber er muss ihn nicht gelesen haben.
Anatol can the letter read-PPP have-INF but he must it NEG read-PPP have-INF
'It could be that Anatol has read the letter but it need not be that he has read it.'
- b. Anatol könnte den Brief gelesen haben, aber er muss ihn nicht gelesen haben.
Anatol can-SBJV.PST the letter read-PPP have-INF but he must it NEG read-PPP have-INF
'It could be that Anatol has read the letter but it need not be that he has read it.'
- c. # Anatol mag den Brief gelesen haben, aber er muss ihn nicht gelesen haben.
Anatol may the letter read-PPP have-INF but he must it NEG read-PPP have-INF
Intended reading: 'It is possible that Anatol has read the letter but it need not be that he has read it.'

The contrasts are maintained even if the order of the conjuncts is swapped.

- (301) a. Anatol muss den Brief nicht gelesen haben, aber er kann ihn gelesen haben.
Anatol must the letter NEG read-PPP have-INF but he can it read-PPP have-INF
'It could be that Anatol has read the letter but it need not to be that he has read it.'
- b. Anatol muss den Brief nicht gelesen haben, aber er könnte ihn gelesen haben.
Anatol must the letter NEG read-PPP have-INF but he can-SBJV.PST it read-PPP have-INF
'It could be that Anatol has read the letter but it need not to be that he has read it.'
- c. # Anatol muss den Brief nicht gelesen haben, aber er mag ihn gelesen haben.
Anatol must the letter NEG read-PPP have-INF but he may it read-PPP have-INF
'It is more than probable that Anatol has read the letter but it need not to be that he has read it.'

As these instances indicate, epistemic *mögen* cannot be considered as a well-behaved epistemic possibility modal verb anymore.

This insight is reflected by the manner of how epistemic *mögen* interacts with quantifying NPs. In Section 6.20, it will be shown that typical epistemic possibility modal verbs such as *können* and *könnte* can occur in the scope of a universally quantifying subject NP, as it is shown in (302a) and (302b). These configurations obtain an interpretation in which the culprit can be identified with any person. Such a reading is not available with *mögen* (302c): this pattern is restricted to the narrow scope interpretation, in which the culprit is everybody at the same time.

- (302) a. Dieses Schaufenster kann jeder eingeschlagen haben
 this shop.window can everybody break-PPP have-INF
 ‘Anybody could have broken this shop window.’
- b. Dieses Schaufenster könnte jeder eingeschlagen haben
 this shop.window can-SBJV.PST everybody break-PPP have-INF
 ‘Anybody could have broken this shop window.’
- c. # Dieses Schaufenster mag jeder eingeschlagen haben
 this shop.window may everybody break-PPP have-INF
 ‘Probably, everybody has broken this shop window.’

This equally holds for the examples in the manner of those provided by Huitink (2008) (303) and the two corpus examples (305) and (307). In either case, a substitution by the epistemic modal verb *mögen* causes an interpretation that refers to a very unlikely state of affairs.

- (303) Mindestens drei Männer können der Vater meines Kindes sein.
 at.least three men can the father of my child be-INF
 ‘At least three men could be the father of my child.’
- (304) # Mindestens drei Männer mögen der Vater meines Kindes sein.
 at.least three men may the father of my child be-INF
 Intended reading: ‘Perhaps, at least three men are the father of my child.’
- (305) Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
 as the school the whole day and partially also at later evening accessible
 ist, kann jeder die Kopien mitgenommen haben.²³⁴
 is can everyone the copies with.take-PPP have-INF
 ‘As the school is open during the whole day and sometimes until late in the evening, anyone could have taken the copies.’
- (306) # Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
 as the school the whole day and partially also at later evening accessible
 ist, mag jeder die Kopien mitgenommen haben.
 is may everyone the copies with.take-PPP have-INF
 Intended reading: ‘As the school is open during the whole day and sometimes until late in the evening, everyone has perhaps taken the copies.’
- (307) „Diesen Brief könnte jeder geschrieben haben, es geht in keine politische
 this letter could everyone write-PPP have-INF it goes in no political
 Richtung”, so Werner Hosiner-Gradwohl.²³⁵
 direction so Werner Hosiner-Gradwohl
 ‘ “Anyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’

²³⁴DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05.06. 1998.

²³⁵DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26.09. 2007.

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- (308) # „Diesen Brief mag jeder geschrieben haben, es geht in keine politische Richtung“, so Werner Hosiner-Gradwohl.
this letter may everyone write-PPP have-INF it goes in no political direction so Werner Hosiner-Gradwohl
‘Intended reading: “Everyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’

Finally, examples in which a universally quantifying NP takes scope over epistemic *mögen* could not be found in the DeReKo corpus.²³⁶

What can be concluded from these observations? First of all, this indicates that epistemic *mögen* cannot be considered as a well-behaved possibility modal verb, just as with epistemic *dürfte*. At this point the question arises for what reason epistemic *mögen* behaves in a different manner. On the one hand, one could assume that it is its concessive semantics that renders epistemic *mögen* unacceptable in all of the contexts that are typical for true possibility modal verbs. But as has been indicated above, epistemic *mögen* can occasionally occur with a more neutral interpretation that lacks any concessive resonance. In all the examples above, there is nothing that suppresses that latter type of interpretation. In principle, these instances can always be interpreted with both readings. But even under the neutral epistemic interpretation, these examples do not seem to get any better. Thus, the concessive resonance does not appear to have any influence on the acceptability of epistemic *mögen* in the distributions above.

On the other hand, it could turn out that epistemic *mögen* involves a modal force that is stronger than possibility, just as it is the case with epistemic *dürfte*. This assumption gains further support by the observation that the most appropriate substitute for epistemic *mögen* is epistemic *dürfte* in a lot of contexts. Furthermore, epistemic *mögen* can be combined with the sentence adverb *gewiss* ‘certain’ in (297), which is generally held as a an adverb of epistemic necessity.

Finally, it could be another semantic feature yet to be discovered that decreases the acceptability of *mögen* in the examples above. Maybe it qualifies the type of premises or evidence the epistemic conclusion is based upon, like in the case of epistemic modal verbs in the subjunctive of the past.

Summing up, it has been shown that epistemic *mögen* is very peculiar in much respect in Contemporary German. It cannot be considered as a prototypical possibility verb anymore, this is somewhat surprising, as Fritz (1997, 9) has illustrated that it was the first of the traditional modal verbs that developed an epistemic interpretation. Moreover, it was one of the most frequent modal verbs until the Early New High German period. At this point, the question arises as to which extent these peculiarities already existed in earlier stages of German.

Firstly, there is good evidence that the concessive epistemic use of *mögen* is a rather late development. On the one hand, Fritz (1991, 48) has failed to attest it for the 16th century in his corpus. Yet, in a corpus study which has been undertaken in the course of the investigation presented here, a plausible candidate from 1537, as example (5) in Section 9.1 illustrates. In this period, the most typical epistemic possibility verb appears to be rather the subjunctive of

²³⁶The investigation of the DeReKo corpus has been carried out on 22nd November 2012, exploiting the Corpus TAGGED-T based on the queries (jeder /+w3 mag) /s0 (MORPH(VRB pp) sein) and (jeder /+w3 mag) /s0 (MORPH(VRB pp) haben)

the past form *möchte*. This could be indicative that epistemic concessive *mag* was not yet frequently used in this period. On the other hand, Allard (1975, 69,70) concludes that *mögen* with concessive resonance is derived from the more neutral use. This corresponds to the scenario for *mögen* provided by Bech (1951, 23), Fritz (1997, 9) and Diewald (1999, 392), who have demonstrated that *mögen* used to be the default possibility modal verb until the Early New High German period until it became gradually replaced by the new possibility modal verb *können*. In turn, *mögen* has acquired a new semantic features and has developed an emotive reading. In order to ensure the semantic integrity of the lexicon entry, all the readings of *mögen* were affected. This explains why *mögen* turned into a concessive epistemic modal verb in the first place and why the neutral epistemic reading is about to disappear, this will be furthermore addressed in Chapter 9.

However, there is a second issue that cannot be solved that easily. It is not clear whether *mögen* occurred as a well-behaved epistemic possibility modal verb at all. It still remains to be verified whether there is any evidence that epistemic *mögen* was acceptable in the environments typical for possibility verb in any earlier stage of German.

4.2.8 *möchte*

As it has been illustrated in the preceding section, the morphological subjunctive of the past form of *mögen* has lost its original meaning and has emancipated from its stem lexicon entry. Accordingly, *möchte* does not contribute any counter-factual resonance anymore and it developed into a volitional verb which resembles *wollen* in much respect. A similar observation can be found in Lötscher (1991, 338, 354). These facts have motivated a whole range of authors such as Öhlschläger (1989, 7), Kiss (1995, 162), Fritz (1997, 103), Diewald (1999, 144), Wurmbrand (2001, 137, 183, 224) and Axel (2001, 40) to assume that *möchte* is to be seen as an independent lexical item. A similar perspective is taken by Reis (2001, 286), but in a less explicit manner. The case of *möchte* is reminiscent of English *must*. As Curme (1931, 410) has pointed out, it is a former subjunctive of the past form that has acquired present indicative meaning.

Nevertheless, there is no consensus to which extent *möchte* should be considered as an independent modal verb on its own. This is partly due to the difficulties of finding a consistent definition for the so-called modal verbs in German, as has been already shown in Section 4.1.

What reasons are there in favour of an analysis as independent modal verb? First and foremost, the semantic interpretation of *möchte* cannot be compositionally derived from *mögen*. Rather, it acquired a meaning that is almost identical to the one of *wollen*. As Diewald (1999, 147) assumes, the only difference compared to *wollen* concerns the expectations of the subject referent. In the case of *möchte*, the subject referent does not insist that the state of affairs expressed by the infinitive will be realised, he leaves the option of refraining from his intention. In a similar vein, Welke (1965, 114) and Vater (2010, 104) observe that *möchte* sounds more formal and polite than its counterpart *wollen*. Due to its behaviour that is almost identical to *wollen*, there is no plausible reason to exclude *möchte* from the group of modal verbs. If one considers *wollen* as genuine modal verb, one has to consider *möchte* as well. Finally, the two volitional verbs share another striking property: both of them are no preterite-presents but they originated in an old optative or subjunctive form and emancipated from this form.

However, there are also reasons that count against an approach that classifies *möchte* as a

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proper and independent modal verb. On the one hand, it is far from obvious to which extent *möchte* has indeed acquired a complete morphological paradigm including non-finite and past forms. On the other hand, some authors argue that a proper modal verb has to involve an epistemic interpretation as well. Öhlschläger (1989, 8, 93) excludes *möchte* explicitly from the class of modal verbs as he doubts that it can be interpreted in a (reportative) epistemic manner. Following the same line of reasoning, Reis (2001, 310) does not appear to consider it as a clear member of that class, either.

As recent studies have revealed though, non-finite uses of *möchten* are well attested in spoken language and partially in written texts. Furthermore, there are some instances of reportative *möchte* and possibly epistemic *möchte* as well. Vater (2010, 103) illustrates that *möchte* had already developed a proper infinitive on its own in the 19th century: the example (309) provided by Vater is taken from a fictional text that reflects the spoken language in Austria. Furthermore, such uses are well attested in the Internet (310)–(311).

- (309) daß der Muckerl kein' andere will, wie dich und, selbst, wenn er eine
that the Muckerl no other as desires you and even if he a
möchten tat, mich schon af d'allerletzt, das weißt. ...²³⁷
want-INF do-SBJV.PST me already on the.last that know
'That Muckerl desires no other one than you and even if he wanted one, I would be the last one, you know that.
- (310) Wenn Sie sich bereits entschieden haben, bei uns eintreten zu möchten, sollten
if you REFL already decide have at us join-INF to want-INF should
Sie folgenden Ablauf beachten.²³⁸
you following procedure notice-INF
'In case you have already decided to (want to) join us, you should consider the following procedure.'
- (311) Ohne moralisch werten zu möchten, kann der Monotheismus nicht mit dem
without morally judge-INF to want-INF can the monotheism NEG with the
Polytheismus verglichen werden²³⁹
polytheism compare-PPP PASS.AUX-INF
'Without having the intention to judge in a moral way, monotheism cannot be compared to polytheism.'

Apart from that, the infinitive form *möchten* can be frequently heard in spoken language by attentive listeners. Similar observations have been made by Eisenberg et al. (2005, 566).

It appears, then, that *möchte* undergoes the same development like *wollen* and the other modal verbs. It used to be a verb form of a particular verb that emancipated and became an independent verb on its own. Thus, they all started out with a defective morphological paradigm that lacked in particular non-finite forms and forms for the past. Step by step, they developed the missing

²³⁷Ludwig Anzengruber, *Sternsteinhof*, p. 42, (1890)

²³⁸<http://www.thw-nuernberg.de/mitmachen/> accessed on 1st December 2011.

²³⁹<http://www.religionsforum-woegeichhin.de/t2163f16-Ellinai-Zurueck-zu-Goettervater-Zeus.html> accessed on 1st December 2011.

forms. Recall that Ebert et al. (1993, 413f.) have demonstrated that none of the traditional six modal verbs had developed a proper past participle until the 13th century.

Secondly, as it will be shown in the respective section below, there are a couple of instances that could be considered as reportative or possibly epistemic usages as well. This indicates that there is much convincing evidence to analyse *möchte* along the line of *wollen*. There are a couple of distributions in which *möchte* could not be attested. It is not obvious why this is the case. This behaviour could be accounted for on the base of the assumption that *möchte* is less developed or less modal than *wollen*. Alternatively, it could be explained in terms of frequency. Firstly, volitional *möchte* occurs far less frequently than volitional *wollen*. And all of these environments, in which *möchte* could not be attested turn out to be environments in which its cognate *wollen* is fairly rare as well.

The volitional verb *möchte* behaves in a manner almost identical to the one of *wollen*. All the exceptional properties that could occur along with *wollen* appear to hold for *möchte* as well. There does not appear to be any spectacular behaviour that is particular to *möchte*. To avoid any unnecessary redundancy, the comments in this section will be rather short. To understand the nature of the volitional verbs such as *möchte* and *wollen* in more detail, the reader is referred to the Section 4.2.3 which is devoted *wollen*.

Transitive uses

In analogy to *wollen*, it is expected that *möchte* used without infinitive should be possible as a transitive verb as well. As it has not developed a proper past participle yet, it is not possible to apply the passive test. Given these circumstances, it will only be shown here that instances without a infinitive complement exist. It is not possible to directly prove that these occurrences involve indeed transitive patterns, it just can be concluded from the nature of *wollen*, which is arguably the prototype for volitional *möchte*. Some authors such as Raynaud (1977, 5) and Eisenberg (2004, 96) explicitly assume that *möchten* can occur with NP objects. Instance like (312) or (313) are frequently found in corpora.

- (312) 94,6 Prozent der Deutschen möchten eine deutlich bessere Kennzeichnung
 96,4 percent the-GEN German want a clearly better labelling
 von gentechnisch veränderten Lebensmitteln.²⁴⁰
 of genetically manipulated food
 ‘96,4 percent of the German population want a clearly better labelling of genetically manipulated food.’
- (313) Kinder sind am besten bei Mann und Frau aufgehoben. Eine völlige
 children are at best at man and woman stored a complete
 Gleichstellung möchten wir nicht.²⁴¹
 equalisation want we NEG
 ‘Kids should preferably be raised by man and woman. We do not want an entirely equal treatment.’

²⁴⁰DeReKo: HMP09/APR.01329 Hamburger Morgenpost, 16.04. 2009

²⁴¹DeReKo: M09/JUL.58113 Mannheimer Morgen, 25.07. 2009

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In both cases, a passivisation is plausible if *möchte* is replaced by *wollen*.

dass-clauses

A whole range of authors such as Welke (1965, 114), Raynaud (1977, 6), Öhlschläger (1989, 70), Reis (2001, 304), Vater (2010, 105) have already observed that *möchte* can select finite *dass*-clauses, just as *wollen* does. Such examples are well attested in corpora, as is exemplified in (314) and (315):

- (314) Es ist egal, was Suri machen möchte, Tom möchte, dass sie es besser kann
it is equal what Suri make-INF wants Tom wants that she it better can
als alle anderen.²⁴²
than all others
'No matter what Suri wants to do, Tom wants that she does it better than any one else.'
- (315) So möchten 91 Prozent der Frauen, dass ein neuer Verehrer ihnen
so want 91 percent the-GEN women-GEN that a new admirer them
bereits bei der ersten Verabredung einen Kuss gibt.²⁴³
already at the first date a kiss give
'Accordingly, 91 percent of the women want that new admirers kiss them already on their first date.'
- (316) Hier bleibt ihr bitte stehen, weil hier möchte ich nicht, dass ihr alleine
here stay you please stand because here-FOC want I NEG that you alone
rübergeht.²⁴⁴
over.go
'Here you have to stop, as I do not want you to cross the street alone here.'

The example taken from spoken language (316) provides an interesting case as it contains an extraction of the locative adverb *hier* 'here' which bears focus across the boundary of the *dass*-clause. It is remarkable that the extracted VP-adverb *hier* 'here' bears contrastive focus accent. Accordingly, it could be considered of an instance of *A'*-movement, just as *wh*-movement. As a consequence, it is reminiscent of extractions out of *wh*-clauses, which is acceptable at least in some southern varieties of German.

Control infinitives with event modification

Most notably, *möchte* occurs with a bare infinitive complement displaying a volitional interpretation. Just as its volitional cognate *wollen*, it is generally held to be a control verb involving a proper subject argument on its own, as it has been demonstrated by Öhlschläger (1989, 119), Kiss (1995, 162), Diewald (1999, 140), Axel (2001, 40), Erb (2001, 78), Reis (2001, 302) and Wurmbrand (2001, 170). Such patterns are very frequently attested in corpora, such as (317)–(318):

²⁴²DeReKo: HAZ09/APR.01834 Hannoversche Allgemeine, 11.04. 2009.

²⁴³DeReKo: M08/FEB.12973 Mannheimer Morgen, 19.02. 2008.

²⁴⁴Mother to her children, Berlin Charlottenburg 2th June. 2012.

- (317) Kinder oder Ehepartner können nichts dagegen unternehmen, wenn ihr
 children or spouse can nothing against undertake-INF if their
 Verwandter seinen Körper plastinieren lassen möchte²⁴⁵
 relative his body plastinate-INF let- wants
 ‘Children or spouses cannot prevent their relatives from getting plastinated if they want to
 become plastinated.’
- (318) Ich möchte Sprengmeister werden.²⁴⁶
 I want blaster become-INF
 ‘I want to become a blaster.’

Once again, *möchte* with bare infinitive is almost synonymous to its counterpart *wollen* in these examples.

Control directionals with event modification

As Szumlakowski-Morodo (2006, 330) has already pointed out, *möchte* also takes verbless directional phrase complements. Patterns such as (319) and (320) can be found in the DeReKo corpus:

- (319) Die 15-Jährige möchte gern zur Polizei.²⁴⁷
 the 15.year.old wants gladly to.the police
 ‘The 15 year old would like to join the police.’
- (320) Ein Umzug dürfte notwendig werden, doch kaum jemand der
 a relocation might necessary become-INF but hardly any the-GEN
 verbliebenen Mieter möchte raus aus dem Haus.²⁴⁸
 remaining-GEN tenants-GEN wants out of the house
 ‘might become possible, but hardly any of the remaining tenants want to quit the house.’

Szumlakowski-Morodo (2006) indicates that verbless directional phrases such as the ones illustrated above do not involve an ellipsis of the infinitive.

Raising infinitives with event modification

As it has been already suggested by Wurmbrand (2001, 170), *wollen* is not the sole volitional verb that can be used with weather verbs. Apart from *wollen*, *möchte* can also occur in these configurations which are usually being held to indicate a raising pattern. Similar to the case of *wollen*, a couple of different patterns have to be distinguished.

First of all, there is the negative polar raising pattern of *möchte*, as it is illustrated in the examples (321) and (322):

²⁴⁵DeReKo: M09/JAN.02729 Mannheimer Morgen, 13.01. 2009.

²⁴⁶DeReKo: M06/JUL.58784 Mannheimer Morgen, 26.07. 2006.

²⁴⁷DeReKo: HAZ09/JAN.04281 Hannoversche Allgemeine, 27.01. 2009.

²⁴⁸DeReKo: BRZ08/OKT.15219 Braunschweiger Zeitung, 30.10. 2008.

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- (321) Der Frosch verwandelt sich trotz Mundspray und liebevollem Kuss nicht in
the frog changes REFL despite mouth.spray and loving kiss NEG in
den ersehnten Prinzen. Auch bei der Kröte und der Ratte möchte das Vorhaben
the longed.for Prince also with the toad and the rat wants the enterprise
nicht gelingen.²⁴⁹
NEG succeed-INF
'The frog does not change into the longed for Prince, despite a mouth spray and a tender
kiss. The enterprise simply does not to happen to succeed with the toad and the rat either.'
- (322) „[...]So erschöpft und kaputt ist man während einer Etappe, wenn der Anstieg
so exhausted and broken is one during a stage when the climb
einfach nicht aufhören möchte oder der Schneesturm unbarmherzig tobt”,
simply NEG end-INF wants or the snowstorm mercilessly blusters
beschreibt der Hundesportler schwache Momente auf dem Schlitten und fährt
describes the dog.sportsman weak moments on the sledge and goes
fort.²⁵⁰
on
' "One is that much exhausted and beat-up at some a stage if the climb simply does not
happen to end or the snowstorm is mercilessly blustering" the dog sledge pilot describes
weak moments on the sledge and continues.'

Just as the typical cases of negative polar raising *wollen*, the utterance in (322) contains the adverb *einfach*.

Apart from this usage, *möchte* occurs as a raising verbs in an environment in which it is almost synonymous to the necessity modal verb *müssen*, just as the respective raising pattern of *wollen*, which has been discussed by Helbig and Buscha (2001, 121).

- (323) Da möchte das Geschriebene erst recht und lückenlos entschlüsselt sein.²⁵¹
there wants the written yet right and completely decode-PPP be-INF
'In this case, the writings have to be even more completely decoded.'
- (324) Den Klassenerhalt als Ziel ausgegeben haben die TSG Rheinau und der SC
the class.sustain as goal defined have the TSG Rheingau and the SC
Rot-Weiß Rheinau II, der aber früher gesichert sein möchte als in der
Red-White Rheinau II the but earlier assure-PPP be-INF want as in the
vergangenen Runde.²⁵²
previous round
'TSG Rheingau and SC Red-White Rheinau II have defined as their goal to say in the same
league, but this has to be assured earlier than in the previous playing time.'

Finally, there are rare instances of *möchte* that exhibit the old meaning of a possibility modal

²⁴⁹DeReKo: A00/FEB.13085 St. Galler Tagblatt, 21.02. 2000.

²⁵⁰DeReKo:NON09/FEB.10904 Niederösterreichische Nachrichten, 23.02. 2009.

²⁵¹DeReKo: A99/AUG.59080 St. Galler Tagblatt, 28.08. 1999.

²⁵²DeReKo: M09/AUG.64710 Mannheimer Morgen, 19.08. 2009.

verb. In the example given below, *möchte* is more appropriately substituted by *könnte* rather than *will*.

- (325) und ehe ich das Licht auslöschte, versuchte ich, ob es mir wohl gelingen
and before I the light out.put tried I if it me possibly succeed-INF
möchte, die scharfe Spitze ein paar Zoll tief in die Brust zu senken. da dieses
wants the sharp point a some inch deep in the chest to sink as this
aber niemals gelingen wollte, so lachte ich mich zuletzt selbst aus, warf
but never succeed-INF want so laughed I REFL finally self out threw
alle hypochondrische Fratzen hinweg, und beschloß zu leben²⁵³
all hypochondriac grimaces away and decided to live
'and before I put out the light, I tried if it could succeed to sink the sharp point a couple of
inches deep into the chest. But, as this never happened to succeed, I laughed out loudly and
threw away all of the hypochondriac grimaces and decided to live.'

Raising directionals with event modification

In opposition to *wollen*, the raising pattern of *möchte* could not be attested in the DeReKo corpus. However, it is not evident whether this circumstance is due to a smaller degree of grammaticalisation of *möchte* or due to the fact that *möchte* is by far less frequent than *wollen*.

Control infinitives with clause modification

Whereas Öhlschläger (1989, 93) assumes that *möchte* cannot be interpreted in a reportative manner, Vater (2010, 107) provides an interesting example (326), in which *möchte* appears to exhibit a reportative interpretation. An analogous example could also be found in the DeReKO corpus (327) and in another text (328).

- (326) Niemand aus der Nachbarschaft will etwas bemerkt haben, keiner
nobody from the neighbourhood wants something notice-PPP have-INF nobody
möchte auch nur Verdacht geschöpft haben.²⁵⁴
wants also only suspicion scoop-PPP have-INF
'All of the neighbours claim that they had not noticed anything, all of them claim that they
did not have any suspicion.'
- (327) Keine Bedenken gegen das neue Einkaufszentrum zu haben möchte Gerda
no objections against the new shopping.mall to have-INF wants Gerda
Stecker jedoch nicht gesagt haben.²⁵⁵
Stecker yet NEG say-PPP have-INF
'Gerda Stecker claims that she has not said, she has any objections against the new shopping
mall.'

²⁵³DeReKo: GOE/AGD.00000 Goethe: Dichtung und Wahrheit.

²⁵⁴Kölner Stadtanzeiger, 30.8. 2006, as quoted in Vater (2010, 107).

²⁵⁵DeReKo: V99/NOV.52643 Vorarlberger Nachrichten, 04.11. 1999.

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- (328) Wie die Milizen im einzelnen zusammengesetzt waren, ist umstritten, weil
if the militia in.the only composed were is contested because
keine der bekannten Gruppierungen dabeigewesen sein möchte.²⁵⁶
none the-GEN known-GEN groups-GEN be.present-PPP be-INF wants
'It is contested how the militias were composed because all of the known groups claim to
not have been involved.'

All of the instances of *möchte* in the examples embed a predication that refers to a past event. Accordingly, they behave like canonical reportative modal verbs. Even if they do so, it merits closer attention that all of them occur with a negation. As it has been illustrated in Section 4.2.3 and 4.2.6, it is not easy to determine the scope of a negation with a volitional modal verb.

Likewise, the negation behaves in a somewhat peculiar manner in the examples given above that involve a negative quantifier in subject position (326) and (328). Ehrich (2001, 167) assumes that reportative modal verbs in German always bear scope over a negative operator as such a configuration provides the more plausible interpretation for reportative modals: *x claims that not (p)* rather than *x does not claim that p*. In a similar manner, Öhlschläger (1989, 93) concludes that the narrow scope interpretation for reportative modal verbs is by far the more natural one. However, he does not want to exclude configurations in which the negation takes scope over the reportative modal verb. Examples (326) and (328), in which *möchte* involves a negative subject quantifier, are essential challenges for both approaches. Being a control verb, *möchte* requires a subject referent. Accordingly, the subject NP cannot have entirely raised from the infinitival clause. Hence, there are three options for how the interpretation comes about. Firstly, one could assume that the negative subject NP has not raised at all. In correspondence, the negation should be interpreted in the subject position and (329) would be the corresponding gloss. This does not seem to be the case. Alternatively, one could argue that only the negative particle has raised into the subject position in which it has attached to the subject NP. Given that the decomposition of the negative quantifier *niemand* 'nobody' and *keiner* 'no' results in the combination of operators $\neg\exists$ rather than $\forall\neg$, the expected circumscription should be (330). Once again, this is not the case. The most appropriate gloss is the last one (331).

- (329) # Nobody claims to have had a suspicion.
(330) # Somebody claims to have not had any suspicion.
(331) Everybody claims to have not had any suspicion.

Finally, one could argue that the reportative uses of *wollen* and *möchte* involve a bigger range of interpretation than is usually assumed. Besides its reference to a claim, it could possibly denote a confession as well. This would be appropriate in the examples given above. Yet, it remains to be explained why this shift just occurs if a negation is present. Apart from that, it appears to be plausible that the strange interaction is a result of an implicature, just as in the case of *sollen*, as it has been pointed out in Section 4.2.6. Unless *möchte* is not attested in environments without negation, we should not jump to the conclusion that it can be considered as reportative modal verb without any restriction.

²⁵⁶Noam Chomsky *Offene Wunde Nahost*, translated by Michael Haupt, Europa Verlag, p. 167.

Raising infinitives with clause modification

Finally, there are a couple of instances which appear to be interpreted in an epistemic manner. According to Vater (2010, 107), an epistemic *möchte* is attested in Saxonian dialects, cf. (332).

- (332) a. A: Kommt Paul morgen?
comes Paul tomorrow
- b. B: Das möchte schon sein.
That might PAR be-INF
A: ‘Does Paul come tomorrow?’
B: ‘It could be.’

In the example (332) provided by Vater (2010, 107), it is not obvious as to which extent the instance of *möchte* is indeed derived from its volitional use. If this is the case, it should be possible to substitute it by its volitional cognate *wollen* without changing the communicative effect. Alternatively, this occurrence of *möchte* reflects the old use as a possibility verb. In this case, its appropriate substitute would be *könnte*.

Occasionally, instances of epistemic *möchte* can be found in which it is more adequately replaced by *könnte*, such as the pattern (333) given by Zifonun (1997, 1270) and the example from the DeReKo corpus (334).

- (333) Nicht so sehr von dem Gedanken, daß Eduard unter Umständen für ihre
NEG so much by the thought that Eduard under circumstances for her
Ehre sein junges Leben möchte in die Schanze zu schlagen haben,– die
honour his young live wants in the entrenchment to beat-INF have-INF the
romantische Vorstellung obgleich sie darüber geweint hatte, ließ ihr Herz eher
romantic image even.if she there cried had let her heard rather
höher schlagen.²⁵⁷
higher beat-INF
‘It was not so much this thought that Eduard possibly would risk his life to defend her
honour, it was rather the romantic image that made her heart beat faster – even if she had
cried about it.’
- (334) Erbrochenes, Schweiß, Kot und Sperma ziehen sich durch das Werk, als
vomit sweat faeces and sperm draw REFL through the act if
wär’s ein neuer Megaseller von Charlotte Roche. Ist es aber nicht.
is-SBJV.PST a new bestseller by Charlotte Roche is it but NEG
Gottlob, möchte man meinen.²⁵⁸
thank.god could one opine-INF
‘The book is as if it was a new bestseller by Charlotte Roche. But it is not. „Thank God”,
the readers could opine.’

²⁵⁷Thomas Mann, Erzählungen volume 8, as cited in Zifonun (1997, 1270).

²⁵⁸DeReKo: HAZ09/JAN.02665 Hannoversche Allgemeine, 19.01. 2009.

4 Is there a class of modal verbs in German?

Epistemic *möchte* does not occur very frequently with a possibility interpretation any more in German. It is mostly restricted to idiomatic collocations such as *möchte meinen* ‘could believe’ (334). The context of this example is rather opaque. A similar occurrence of *möchte* is discussed by Welke (1965, 116).

4.2.9 *brauchen*

In contrast to the items discussed so far, *brauchen* ‘need’ has a very different origin with respect to its morphological paradigm. It is neither a preterite-present nor did it develop from a former optative form such as in the case of *wollen*. Nevertheless, it exhibits a whole range of properties which are typical to the six traditional modal verbs. However, its precise status is contested. On the one hand, grammarians such as Engel (1996, 463), Weinrich (1993, 300) and Szumlakowski (2010, 79) regard *brauchen* as a fully developed modal verb, others such as Brinkmann (1962, 363) and Öhlschläger (1989, 8) explicitly exclude *brauchen* from the class of modal verbs. Less clearly, the latest edition of the popular *Duden* grammar edited by Eisenberg et al. (2005, 562) appears to be inclined to consider *brauchen* as a modal verb: *brauchen* ist seiner Verwendung nach den Modalverben zuzurechnen (‘Regarding its uses, *brauchen* has to be considered as modal verb’).

What reasons are there that are in favour of the perspective that *brauchen* should be considered as a modal verb? There are at least six reasons. Firstly, it shares an essential morphological peculiarity with the traditional six modal verbs: (i) In perfect tense, the past participle selected by the tense auxiliary *haben* ‘have’ is formally identical to the infinitive. This phenomenon is referred to as *infinitivus pro participio* (IPP)-effect and has been already discussed at length in Section 4.1.1. (ii) Kolb (1964, 74) has shown that *brauchen* has unexpectedly acquired the irregular subjunctive of the past form *bräuchte* ‘need-sbjv.pst’ which involves an *Umlaut*. Originally, *brauchen* is a regular verb which does not involve an *Umlaut* in their subjunctive of the past forms. Moreover, there are syntactic similarities. Folsom (1968, 322f.) and Szumlakowski (2010) have pointed out that *brauchen* can sometimes occur with (iii) a bare infinitive complement and (iv) verbless directional phrases, just as the traditional six modal verbs do. Apart from that, (v) *brauchen* is restricted to negative environments. In this respect it behaves like a whole range of other modal auxiliaries, such as raising *wollen* (cf. Section 4.2.3), volitional *mögen* (cf. Section 4.2.7). Furthermore, Bech (1951, 14), Kolb (1964, 73) and Lenz (1996, 399) have shown that *brauchen* is just as negative polar as its predecessor *dürfen* (cf. Section 4.2.4). Finally, there are also semantic reasons that are in favour of an analysis of *brauchen* as a modal verb. As Kolb (1964, 74), Lenz (1996, 402) and Askedal (1997a, 61), illustrate, (vi) *nicht brauchen* ‘not need’ denotes a negated circumstantial necessity just as *nicht müssen*. In addition, (vii) Takahaši (1984), Askedal (1997a, 62), Reis (2005a, 112) point out that there are instances of *brauchen* that appear to involve an epistemic interpretation.

In contrast, there are a couple of circumstances that led other authors to the conclusion that *brauchen* should not be fully considered as a modal verb in German. Some authors such as Brinkmann (1962, 363) and Maitz and Tronka (2009, 189) argue that *brauchen* differs crucially from the traditional modal verbs in various respects: it selects (i) *zu*-infinitive complements rather than bare infinitive complements and (ii) it is restricted to negative polarity environments. However, as it has been illustrated above, negative polarity is a property that occurs with three out

of six members of the traditional modal verb class: volitional *mögen*, the raising use of *wollen* and *dürfen* up to the 16th century. Furthermore, Paul (1897, 79) demonstrates that *brauchen* has replaced *dürfen* in its original meaning. This indicates that negative polarity is rather a property typical to modal verbs. Apart from that, other authors such as Folsom (1968, 328) and Öhlschläger (1989, 8) challenge the existence of an epistemic interpretation. Yet, these authors have not taken into account the corpus examples provided by Takahaši (1984). As it will be shown below, it is far from evident whether *brauchen* has a well established epistemic interpretation.

As it turns out, most of the remaining Germanic languages involve an equivalent verb that almost exactly reflects the situation in German. Mortelmans et al. (2009, 17) illustrate that in Dutch *hoeven* ‘need’ usually selects *te* infinitive complements. Sometimes, it can be found with bare infinitive complements. Just as with its German counterpart *brauchen* it is restricted to negative polarity environments. As Scaffidi-Abbate (1973, 14) points out, Afrikaans *bruik* exhibits almost the same situation. Yet, he considers a German influence as fairly unlikely. As Kolb (1964, 76) and Scaffidi-Abbate (1973, 30) indicate, the verb *need* in English is a negative polarity item as soon as it selects infinitive complements. Similar to *brauchen*, it was originally restricted to *to*-infinitive complements rather than bare infinitive complements. In the course of history, bare infinitive became possible as well. These observations can be extended to Northern Germanic languages as well. Eide (2005, 77) has demonstrated that *behøve* ‘need’ and *trengje* ‘need’ in Norwegian can be used to express a necessity. In this use, these verbs are negative polarity items and alternate between *å*-infinitive complements and bare infinitive complements. In a similar fashion, Mortelmans et al. (2009, 42) show that Danish *behøve* ‘need’ originally only selected *at* infinitive complements. At some later moment, bare infinitive complements became possible as well. As Paulina Tovo (pers. commun) has pointed out, it is restricted to negative environments in this use. As it turns out, all of these languages that are genetically related to each other have developed an analogous pattern. Yet, the most astonishing circumstance is that almost each language has chosen a verb with another etymological origin to adopt the role of *brauchen*. As Scaffidi-Abbate (1973, 20) remarks this behaviour is parallel to Latin *uti* which originally used to be restricted to negative environments.

This discussion about the precise status of *brauchen* with respect to the modal/auxiliary verbs has existed since the 19th century. As it has been already illustrated in Section 4.1.1, Grimm (1837, 168, 949) is reluctant to consider *brauchen* as an auxiliary verb. According to his judgement, verbs that select *zu*-infinitive complements are generally incompatible with the IPP effect and must not be used in this manner. In a note on page 949, he discusses an example of *brauchen* with *zu*-infinitive complement that exhibits the IPP-effect. In contrast, Becker (1836, 177 §91) and Becker (1842, 220 §91, 224 §93) explicitly classifies *brauchen* with an infinitive complement as a *Huelfsverb des Modus* ‘auxiliary of mood’. He only considers cases in which *brauchen* selects *zu*-infinitive complements. And the fact that this configuration differs from more canonical modal verbs such as *müssen* does not appear to bother him. Decades later, Sanders (1908, 101), who is another normative grammarian, considers *brauchen* with the IPP-effect as fully grammatical and observes that the infinitive particle *zu* can be dropped under certain conditions even in formal language.

In the remainder of this section, the multitude of the different uses of *brauchen* will be discussed. Above of all, *brauchen* is used as a transitive verb that selects an accusative NP. In this

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employment, it is not restricted to negative polarity environments. Apart from that, it is occasionally found with finite *dass*-clauses. Furthermore, it can be used in an impersonal pattern with a non-referential subject NP. Most notably, it is used with a raising infinitive complement that exhibits a circumstantial interpretation. Next to a practical necessity reading, it can be used as a quantificational modal verb as well, just as *können* and *nicht müssen* can be. In the most canonical cases, it involves a subject-to-subject raising configuration, in some varieties a subject-to-object (AcI/ECM) pattern seems to be possible as well. Moreover, it can be combined with verbless directional phrases. Finally, it is very rarely attested with an epistemic interpretation. As it turns out, *brauchen* behaves, in much respect, like the most prominent members of the traditional six modal verbs.

Transitive uses

As it is well known, *brauchen* is a transitive verb. Paul (1897, 79), Kolb (1964, 65), Scaffidi-Abbate (1973, 11, 19) illustrate that *brühhan/brühhen* in Old High German originally used to refer to the enjoyment or the consumption of something just as the English verbs ‘to enjoy/consume’ can be. In this period, it selected a genitive NP. Gradually, *brühhan/brühhen* developed a new meaning expressing the usage of an object. At the same time, it is attested with an accusative NP for the first time. Paul (1897, 79) and Scaffidi-Abbate (1973, 19) further demonstrate that *brauchen* has acquired a new meaning in the 17th century. In texts from that period, it occasionally expresses a need or requirement. It merits closer attention that the new meaning of transitive *brauchen* was initially restricted to negative contexts, as Paul (1897, 79), Scaffidi-Abbate (1973, 19) and Kluge (2011, 147) have pointed out. In the course of time, transitive *brauchen* became acceptable in non-negative environments as well. With the latter meaning, it is frequently attested. Interestingly, the transitive use with an accusative NP drastically outweighs the uses with an infinitive. The examples in (335)–(339) reflect that the range of different uses and morphological peculiarities.

- (335) 1,5 Kilogramm brauchte der arbeitslose Drogenabhängige für den
1.5 kilo.gramme needed the unemployed drug.addict for the
Eigenbedarf.²⁵⁹
personal.need

‘The unemployed drug addict needed 1.5 kilogramme for personal need.’

- (336) Dass der Mann Geld gebraucht hat, wissen wir, sonst hätte er den
that the man money need-PPP(ge) has know we otherwise had he the
letzten Banküberfall nicht begangen.²⁶⁰
last bank.robbery NEG committed

‘We know that the man needed money. Had the man not needed money he would not have committed the last bank robbery otherwise.’

²⁵⁹DeReKo: E99/OKT.27727 Zürcher Tagesanzeiger, 22.10. 1999.

²⁶⁰DeReKo: N00/JUN.25283 Salzburger Nachrichten, 03.06. 2000.

- (337) „Aber wollte Mannheim von der Industrialisierung nicht
 but want-SBJV.PST Mannheim from the industrialisation NEG
 abgehängt werden und zurückfallen, brauchte es neue
 outdistance-PPP PASS.AUX-INF and fall.back-INF need-SBJV.PST it new
 Flächen”, verdeutlichte Probst.²⁶¹
 surface clarified Propst
 ‘“If Mannheim did not want to be outdistanced from the Industrialisation and fall back, it
 would need new surfaces” Probst clarified.’
- (338) Ein Personenzug bräuchte für die rund elf Bahnkilometer nach
 a passenger.train need-SBJV.PST for the about eleven train.kilometres to
 Innsbruck hingegen nur elf Minuten.²⁶²
 Innsbruck however only eleven minutes
 ‘However, it takes a passenger train only eleven minutes to get the eleven kilometres to
 Innsbruck.’
- (339) Zwölf Jahre braucht er, um die Sonne einmal zu umrunden.²⁶³
 twelve years need he in.order the sun once to orbit-INF
 ‘It takes it twelve years to orbit the sun once.’

Crucially, the past participle of transitive *brauchen* is realised as a canonical *ge*-participle in (336). In this environment, it cannot be substituted by the IPP *brauchen*. As indicated above, there are two alternatives of realising the subjunctive past form. The regular form illustrated in (337) is identical to the indicative past tense form *brauchte*. As the conditional configuration given in (337) requires the subjunctive of the past, it becomes obvious that *brauchte* is interpreted as subjunctive of the past rather than the indicative of the past. Apart from that, there is also the irregular form *bräuchte* which differs from the weak form in that it involves an *Umlaut*, as it is demonstrated (338).

This illustrates that the two morphological peculiarities of *brauchen* behave in a different manner: whereas the IPP is restricted to the uses of *brauchen* with infinitive complements, the strong form of the past subjunctive is also available to the transitive uses of *brauchen*.

Finally, there is related use of *brauchen* in which it selects a NP, PP or AP which expresses a time or other measures that are necessary to achieve a certain goal.²⁶⁴ Whereas the measure is can be realised as accusative NP, the goal can be either realised as PP (cf. *nach Innsbruck* ‘to Innsbruck’ in (338)) or as adverbial *um zu*-infinitive (339). But the measure phrase can also be realised as adverb such as *lange* ‘long’. Furthermore, Stefan Müller (pers. commun.) has observed that the NP which expresses the measure does not agree with the passive auxiliary if *brauchen* is passivised. Rather, the passive auxiliary always exhibits the default morphology which is 3. pers. singular.

²⁶¹DeReKo: M04/JUL.45250 Mannheimer Morgen, 07.07. 2004.

²⁶²DeReKo: I97/MAI.16915 Tiroler Tageszeitung, 03.05. 1997.

²⁶³DeReKo: HAZ09/AUG.04419 Hannoversche Allgemeine, 28.08. 2009.

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- (340) [...] weil dafür mehrere Tage gebraucht wurde/
because therefore several days-ACC need-PPP PASS.AUX-SG/
*wurden.
PASS.AUX-PL
‘[...] because it took several days for that.’

These facts indicate that this use of *brauchen* has to be considered as an independent syntactic pattern.

Impersonal *brauchen*

Moreover, *brauchen* can be used as an impersonal verb that lacks a referential subject argument. This use has already been mentioned by Adelung (1793, 1162), Grimm and Grimm (1860, 318) and Paul (1897, 79). Their observation is mainly based on evidence from writers of the 18th century. It is only attested with the new interpretation in which *brauchen* refers to a need. Instead, it selects the non-referential pronoun *es* ‘it’ as subject argument and an accusative NP. Accordingly, the need is not attributed to the subject referent, rather, the bearer of the need remains unspecified. In all of the examples (341)–(343), the subject NP *es* is not a referential pronoun: first, it does not identify the bearer of the need and second, it does not refer to a neuter noun that has been mentioned in prior discourse. In example (341), there is no salient antecedent NP specified for neuter in the prior. The referent to which the need is attributed is anybody who has to wait for a longer period. Accordingly, the impersonal variant of *brauchen* was chosen, in order to leave the bearer of the need as unspecified and generic as possible.

- (341) Werner Ignaz Jans ist ein ungeduldiger Mensch. Und Geduld bräuchte es
Werner Ignaz Jans is a impatient man and patience need-SBJV.PST it
eigentlich, um ein guter Warter zu sein.²⁶⁵
actually in.order a good waiter to be-INF
‘Werner Ignaz Jans is an impatient man. And it is patience that would be actually necessary
in order to wait a long time.’
- (342) Es sieht nicht gut aus für den Frieden in Nahost. Wahrscheinlich braucht es
it sees NEG good out for the piece in middle.east probably need it
ein viertes Wunder, damit er eine neue Chance erhält.²⁶⁶
a fourth wonder in.order.to he a new chance gets
‘There is not much hope for the peace in the Middle East. Probably, a fourth wonder is
necessary in order to give it a new chance.’

²⁶⁴That this use should be considered as an independent use rather than a variant of the transitive use was pointed out to me by Stefan Müller (pers. commun.).

²⁶⁵DeReKo: A01/NOV.42609 St. Galler Tagblatt, 13.11. 2001.

²⁶⁶DeReKo: BRZ06/JAN.09059 Braunschweiger Zeitung, 19.01. 2006.

- (343) Was braucht es außer dem, als daß sie selbst dich liebt?²⁶⁷
 what needs it apart that as that she self you loves?
 ‘What else is necessary as the circumstance that she loves you?’

Interestingly, the impersonal variant of *brauchen* found in DeReKo occurs above all in Swiss newspapers. This high frequency of this pattern in Swiss German could be due to language contact: there is a similar pattern in French that corresponds almost one by one to its German counterpart: *il faut* ‘it necessitates’. Yet, the use of impersonal *brauchen* is not restricted to texts from Switzerland. Occasionally, it can be found in Newspapers from other regions as well, as occurrence taken from a news paper from Lower Saxony indicates (342). Moreover, this pattern is already attested in the early 18th century, in a poem written by Gottsched (343). Following Grimm and Grimm (1860, 318), Kluempers (1997, 87) provides an example exhibiting the impersonal use. It is attributed Johann Balthasar Schupp who lived from 1610–1661.²⁶⁸

- (344) derowegen braucht es mühe (kostet es m.) dasz du wahre freund erwehlest.²⁶⁹
 therefore need it effort (cost it effort) that you true friend chose
 ‘Therefore, effort is required to chose true friends’

This is on a par with the hypothesis that this pattern emerged due to French influence. As Bloch and von Wartburg (1986, 252) demonstrate, the verb *faillir* ‘need’ has developed the impersonal pattern *il faut* in the 14th. In that time it spread consecutively and became a dominant item to express a need. In turn, the existence of impersonal *brauchen* possibly had an impact on the development of *brauchen* with an infinitive. As it will be shown below, *brauchen* with an infinitive involves a raising pattern which is characterised by the lack of the subject argument. It could turn out that the impersonal use of *brauchen* was a prerequisite for the development of the pattern with a raising infinitive. Yet, it is fairly likely that *brauchen* was not directly influenced by the French verb *faillir*. Scaffidi-Abbate (1973, 27) has pointed out that its predecessor *dürfen* in its old interpretation (‘need’) had already developed an analogous impersonal pattern in the early 16th century. In this pattern, the object of *dürfen* is realised as genitive NP. One of the crucial examples provided by the DWB is illustrated in example (193) on p. 94 in Section 4.2.4. Only in a subsequent period the impersonal use of *dürfen* was replaced by its prefixed counterpart *bedürfen*. Finally, after *brauchen* has adopted the old patterns of *dürfen*, it acquired an impersonal use as well. It is quite likely that it initially selected a genitive NP in that configuration which were replaced by an accusative NP in the course of history.

dass-clauses

Apart from that, *brauchen* can occasionally select finite *dass*-clauses. It appears that this employment is restricted to certain registers, as it could not be attested in the DeReKo corpus.²⁷⁰In

²⁶⁷Johann Joachim Schwaben *Herrn Johann Christoph Gottscheds Gedichte XVI. Schreiben an Hr. D. Gottfr. Thomas Ludewig, bey seiner Verheirathung 1732*. Leipzig, Breitkopf (1751), p. 408.

²⁶⁸Kluempers (1997, 87) erroneously ascribes the example to Hans Jakob Christoffel von Grimmelshausen, the author of *Der Abentheuerliche Simplicissimus Teutsch* (1668) – but this is a result of a misinterpretation of Grimm’s system of labelling the sources.

²⁶⁹Schuppius, 756 (around 1650), as quoted in Grimm and Grimm (1860, 318).

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contrast, it can be frequently be found on the web, as it is exemplified in (345).

- (345) Ich brauche nicht, dass meine Fingerabdrücke irgendwo abgespeichert sind,
I need NEG that my fingerprints somewhere store-PPP are,
solange das nicht von der Polizei zwangsweise aufgenommen wurde.²⁷¹
as.long.as that NEG by the police compulsorily record-PPP PASS.AUX.PST
'I do not need that my fingerprints are recorded unless this has been requested by the police.'

It merits closer attention that utterances such as (345) are significantly more acceptable if they involve a negative operator. It seems, then, *brauchen* with finite *dass*-clause is a negative polarity item just as its cognate with the infinitive complement. This illustrates that there is a strong link between the use that embeds non-finite clauses and the one that embeds a finite clause. This is reminiscent of the volitional uses of *mögen*: both uses that embed a finite *dass*-clause or a control infinitive are negative polar.

Interestingly, *dürfen* in its old interpretation ('need') is attested in such a configuration as well, as Scaffidi-Abbate (1973, 27) has demonstrated.

Raising infinitives with event modification

The most thoroughly discussed use of *brauchen* is the one with an infinitival complement. A whole range of authors have pointed out that it exhibits numerous parallels with the six traditional modal verbs in morphological, syntactic and semantic respect. Becker (1836, 177 §91) is the first one explicitly considers *brauchen* with *zu*-infinitive as a 'mood auxiliary'. In the first edition of his grammar, Grimm (1837, 949) has observed that *brauchen* with *zu*-infinitive can exhibit the IPP-effect. As one of the first scholars, Paul (1897, 79) associates *brauchen* with an infinitive complement with the class of preterite presents/traditional modal verbs. As he states, *brauchen* has replaced *dürfen* in its original use which referred to a need or requirement.²⁷² In the same period, Sanders (1908, 101) advised using *brauchen* with a bare infinitive complement. In its first small description, Bech (1955, 210–212) notices that *brauchen* is semantically equivalent to *müssen* and furthermore provides some corpus examples from standard written language. The two studies by Kolb (1964) and Folsom (1968) have pointed out even more parallels with the traditional modal verbs in syntactic and semantic respect. More recent studies such as Takahashi (1984), Askedal (1997a) and Reis (2005a) are dedicated to the question to which extent *brauchen* allows for an epistemic interpretation. They will be taken into consideration in the remainder of this section.

The uses of *brauchen* with an infinitive turn out to be fairly heterogeneous. This is due to the process of grammaticalisation by which this verb is affected. In order to capture the uses of *brauchen* in the most efficient way, it becomes necessary to consider its development as well. Thus, the following section will take a diachronic perspective on several occasions.

Circumstantial *brauchen* with a raising infinitive complement occurs in the DeReKo corpus far less than its transitive counterpart. A similar observation has already been made by Pfeffer (1973, 90) for both written and spoken language. As it has been pointed out by Kolb

²⁷⁰The research was carried out on 20th June 2012 and it was based on the query &brauchen "nicht" dass.

²⁷¹<http://www.computerbase.de/forum/archive/index.php/t-842737.html>, accessed on 23th May 2012.

²⁷²Original quotation: *In dieser Verwendung ist brauchen an die Stelle von dürfen getreten.*

(1964, 64), Folsom (1968, 328), Scaffidi-Abbate (1973, 31), Askedal (1997a, 53) and Reis (2005a, 104), normative grammarians do not tolerate the use of *brauchen* with a bare infinitive complement, they only consider the use with *zu*-infinitive complement acceptable. A similar perspective is taken by Jäger (1968, 332). In the course of the 20th century, *brauchen* with a bare infinitive complement was stigmatised as inferior German. In correspondence, *brauchen* is dominantly used with *zu*-infinitives in written language. Likewise, Pfeffer (1973, 91) could not attest *brauchen* with bare infinitive complements in his corpus of written language.

- (346) Glücklicherweise brauchte niemand evakuiert zu werden, denn in
 Luckily needed nobody evacuate-PPP to PASS.AUX-INF because in
 die Zimmer der Bewohner war der Rauch nicht gelangt.²⁷³
 the room the-GEN tenants-GEN was the smoke NEG get-PPP
 ‘Luckily, nobody needed to be evacuated as the smoke did not get into the rooms of the tenants.’
- (347) Der kostbare Schatz bräuchte nur gehoben zu werden.²⁷⁴
 the precious treasure need-SBJV.PST only heave-PPP to PASS.AUX
 ‘The precious treasure would just need to be heaved.’
- (348) Man braucht nicht weit zu sehn, viel Jammer und Gefahr.²⁷⁵
 one need NEG far to see-INF much misery and danger
 ‘One does not need to look far for much misery and danger.’
- (349) Man siehet aber auch dabey, daß die Schmoschen nicht enge zu seyn
 one sees but also there that the loop NEG tight to be-INF
 brauchen.²⁷⁶
 need
 ‘One can see here, that the loops do not need to be tight.’
- (350) Ein Frauenzimmer braucht nicht gelehrt zu seyn.²⁷⁷
 a woman.room need NEG adept to be-INF
 ‘A woman does not need to be adept.’
- (351) Wir brauchen ja nicht zu lieben.²⁷⁸
 we need PART NEG to love-INF
 ‘We do not need to love.’
- (352) Wir brauchen nur verstellt zu weinen: So thun sie ihre Schuldigkeit.²⁷⁹
 we need only feignedly to cry-INF so do they their guiltiness
 ‘We only need to cry feignedly and they will do their part.’

²⁷³DeReKo: RHZ09/DEZ.06729 Rhein-Zeitung, 07.12. 2009.

²⁷⁴DeReKo: P97/APR.13472 Die Presse, 08.04. 1997.

²⁷⁵Johann Christian Günther *Ode an Herrn Marckard von Riedenhausem Ivris Vtrivsqve Cvltor* (1720) in *Johann Christian Günther Werke* edited by Reiner Bölhoff, Frankfurt: Deutscher Klassiker Verlag, p.620.

²⁷⁶Kurtzer doch gruendlicher Begriff der Edlen Jaegererey. Nordhausen: Groß (1730), p. 498.

²⁷⁷Christian Fürchtegott Gellert, *Die Betschwester*, II. Aufzug 3 Aufzug (1745).

²⁷⁸Christian Fürchtegott Gellert, *Die Zärtlichen Schwestern*, I. Aufzug. 6. Auftritt (1747).

²⁷⁹Christian Fürchtegott Gellert, *Das Orakel* I. Aufzug 4. Auftritt, (1747).

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- (353) Man braucht nur in dem großen Buche der Welt lesen zu können, und one need only in the big book the-GEN world read-INF to can and man wird auf den meisten Seiten desselben so viel Anschweifung finden, daß one will at the first pages of.it so much inspiration find-INF that man fast nur ein glücklicher Abschreiber zu seyn braucht,²⁸⁰ one almost only a happy copyist to be-INF needs
 ‘One only needs to be able to read in the big book of the world and one will find so much inspiration in these pages that one almost only needs to be a lucky copyist.’

As the examples (348) and (349) indicate, *brauchen* with an infinitive is already attested in the early 18th century. Further early examples (350)–(352) are provided by Adelung (1793, 1162) and the DWB in Grimm and Grimm (1860, 318). Moreover, it occurs fairly often in works written by Lessing (1729–1781).

Apart from that, there are early instances of prefixed *gebrauchen* ‘use’ + *zu* infinitive with the same interpretation like *brauchen*, as it is illustrated in (354). This is interesting, as *gebrauchen* has retained the original meaning ‘to use’.

- (354) An den beyden Seiten g g ist dieses Behaeltnis leer geblieben, damit man at the both sides g g is this container empty stay in.order.to one neben dem Lohbeete etwas hoehere Baeume stellen koenne; denn da next the greenhouse something high-COMP trees put can since as ein solches Caldarium nicht hoch zu seyn gebraucht, so ist es auch oben durch a such caldarium NEG high to be-INF needs so is it also up by eine besondere brette, hinten abfallende und auf der Mauer c ruhende Decke a particular wooden back gradient and at the wall c resting ceiling abgeschoren worden.²⁸¹ shave-PPP PASS.AUX
 ‘This container remains empty at both sides g g which permits us to put higher trees next to the underground greenhouse. Since such a caldarium does not need to be high, it has been covered by a particular gradient wooden ceiling that rests on the wall c.’

Sanders (1908, 101) and Wustmann (1908, 354) advise that one should refrain from using (transitive) *gebrauchen* in order to refer to a need for something rather to a usage of something.

A small corpus study investigating ancient Greek and Latin epic poetry translated by Heinrich Voss, comprising Homer’s *Odyssee* and *Illias* and Vergil’s *Äneide*, indicates that all of the occurrences of *brauchen* with an infinitival complement found in these texts select a *zu*-infinitive and they are negative polarity items. In sum, four instances could be found – though it did not occur in the *Äneide*.

- (355) Jetzo, Telemachos, brauchst du dich keineswegs zu scheuen!²⁸² now Telemachos need you REFL by.no.means to dread-INF

²⁸⁰Johann Andreas Cramer, *Der Nordische Aufseher* Kopenhagen und Leipzig: Johann Benjamin Ackermann, (1758) sechstes Stueck, p. 57.

²⁸¹Freiherr von Otto Münchhausen, *Monathliche Beschaeftigungen fuer einen Baum= und Plantagen=Gaertner*, Hannover (1771), p. 202.

‘Now, Telemachos you do not need by no means to dread.

- (356) Aber das weißt ihr selber; was brauch’ ich die Mutter zu loben?²⁸³
 but that know you yourself what need I the mother to praise-INF
 ‘But you know it yourself; what urges me to praise my mother?’
- (357) Alter sie weiß es schon; du brauchst dich nicht zu bemühen.²⁸⁴
 old.man she knows it already you need REFL NEG to seek-INF
 ‘Old man, she already knows it, you do not need to make an effort.’
- (358) Deine Tapferkeit kenn’ ich; was brauchtest du dieses zu sagen?²⁸⁵
 your courage know I what needed you this to say-INF
 ‘I know your courage, what urged you to speak these words?’

As this tendency is reflected by the other examples as well, it appears that *brauchen* was already restricted to the *zu*-infinitive in the 18th century. The very rare instances of positive *brauchen* with an infinitive that are attested in that period will be discussed below.

The examples (356) and (358) merit a closer inspection as they involve a recurrent pattern. Both of the instances of *brauchen* occur in questions that contain a causal use of the interrogative pronoun *was* ‘what’. As Holler (2009) observes, *was* is occasionally interpreted as a causal *wh*-pronoun much in the way of *why*. As it appears, early instances of *brauchen* with *zu* infinitives can often be found in this configuration. Accordingly, it is plausible that this pattern had an impact on the development of *brauchen*.

In the early 18th, the use of *brauchen* with an infinitive complement was not addressed in the respective entry of the main dictionaries, cf. Kramer (1702, 142). This view is further confirmed by Scaffidi-Abbate (1973, 4) who provides a comprehensive overview of the main grammars from the 17th and the 18th century. Adelung (1793, 1162) is the first one to mention *brauchen* with *zu* in a very brief remark. His observations are supported by evidence from two writers from the 18th century: Gellert and Wieland. Becker (1836, 177 §91) has pointed out that *brauchen* with *zu*-infinitive belongs to the field of modal verbs. Likewise, Grimm (1837, 949) provides an example exhibiting the IPP. Subsequent grammarians such as Schoetensack (1856, 295, 297) begin to stress the close relation between *brauchen* and auxiliaries (*Hilfsverb*).

In what follows, it will be investigated to which extent *brauchen* shares the essential properties of the traditional six modal verbs. What properties are there that favour an analysis of *brauchen* as a modal verb? Three different types of properties will be taken into consideration: morphological features, syntactic features and semantic features. As far as morphological aspects are concerned, *brauchen* optionally realises an irregular form when used in the subjunctive of the past that involves an *Umlaut*, as it is illustrated in (347). However, this irregular form is not restricted to uses of *brauchen* with an infinitive complement. Kolb (1964, 74), Scaffidi-Abbate (1973, 32) and Girth (2000, 120) argue that this development is an approximation towards the morphological paradigm of the six traditional modal verbs. They assume that it is an essential

²⁸² *Odyssee*, III, 14 translated by Heinrich Voß, 1781.

²⁸³ *Odyssee*, XXI, 110 translated by Heinrich Voß, 1781.

²⁸⁴ *Odyssee*, XXIV, 406 translated by Heinrich Voß, 1781

²⁸⁵ *Illias*, XIII, 275, translated by Heinrich Voß, 1793

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characteristic of these verbs that they realise the subjunctive of the past with a form containing the *Umlaut*. Accordingly, they conclude that it is this circumstance that causes *brauchen* to choose this unexpected form. However, this is not entirely correct. Firstly, almost every irregular verb in German realises its subjunctive of the past form with an *Umlaut*. In the canonical case, the indicative past tense form of an irregular verb serves the base for the subjunctive of the past form in which the stem vowel is altered by an *Umlaut*, cf. *war* ‘be-PST’ – *wäre* ‘be-SBJV.PST’, *kam* ‘come-PST’ – *käme* ‘come-SBJV.PST’ or *wußte* ‘know-PST’ – *wüßte* ‘know-SBJV.PST’. Crucially, this does not hold for two of the core members of the traditional six modal verbs: the indicative past form and the subjunctive past form of *wollen* and *sollen* are in each case identical and do not involve any *Umlaut*: *wollte* and *sollte*. Furthermore, the two verbs do not fulfil all of the morphological criteria typical to preterite presents, as it has been illustrated in Section 4.1.1. Alternatively, one could assume that the development of the irregular form of *brauchen* has pragmatic reasons. Being a regular verb, *brauchen* does not have distinct forms for the indicative past and the subjunctive of the past form. Any verb in German can alternatively realise an analytic subjunctive of the past based on the subjunctive auxiliary *würde* ‘would’, as already demonstrated in Section 4.2.7. As *brauchen* already selects an infinitive complement, a further auxiliary would increase the degree of syntactic complexity and processability. For this reason, the development of a proper synthetic subjunctive of the past form for *brauchen* turns out to be a mean which facilitates communication. According to this assumption, the irregular form *bräuchte* should first have emerged with *brauchen* with an infinitive complement. Thus, there has to be a period in which *bräuchte* occurred more often with infinitives than with accusative NPs. In any case, it remains to be seen to which extent the transitive use of *brauchen* and its use with a raising pattern have the same preference for the morphological realisation of the subjunctive of the past. It could turn out that one pattern exhibits a significantly stronger preference to realise the past subjunctive as the strong form rather than the weak form. An alternative explanation is based on the observation that the stem *brauch-* could yield an umlaut in other derivations such as the plural of the nominalisation *Bräuche* ‘costums’ or the adjective *bräuchlich* ‘in use’, ‘usual’. As these forms were very present at this period, the speaker could have been inclined to adopt the umlaut for the subjunctive of the past as well.

Finally, this morphological peculiarity could have a different reason. Due to a lack of attested preterite forms, it is not obvious at all to which extent *brühhan* in Old High German belonged to the regular *-jan* or irregular *-an* verbs, as it has been illustrated by Kolb (1964, 68) and Scaffidi-Abbate (1973, 15ff.).

The earliest confirmed occurrences of *bräuchte* originate from the 18th century, approximately the same period when *brauchen* started to select infinitive complements. In both instances, it selects an accusative NP rather than an infinitive complement. This is not surprising as the transitive use of *brauchen* has always been the dominant one. Moreover, it already reflects the new interpretation in which it expresses a need for something rather than the use of something.

- (359) Bräuchte man hier nicht einen Oedip?²⁸⁶
need-sbjv.pst one here NEG a Oedip
‘Do we not need an Oedip here?’

²⁸⁶Johann Jakob Hemmer, *Abhandlung über die deutsche Sprache zum Nutzen der Pfalz*, Mannheim (1769), p. 221 §111.

- (360) Ein Fürst bräuchte keine Tugend, wenn er seyn will, was er
 a sovereign need-SBJV.PST no virtue if he be-INF wants what he
 soll, ein Vater des Vaterlandes²⁸⁷
 should a father the-GEN fatherland-GEN
 ‘A sovereign would not need any virtue if he wants to be what he ought to be: a father of
 the fatherland.’
- (361) Wo er darüber grieffe / vnnd mehr Ackers bräuchte / zu solchem
 where he over touch-SBJV.PST and more acre need-SBJV.PST to such
 seinem sondern nutz / darfür soll er mir als vil frucht in der Schewer
 his particular use therefore shall he me as much fruit in the barn
 geben vnnd bezalen / als die selben Ecker vngefährlich trügen.²⁸⁸
 give-INF and pay-INF as the same acres approximately bear-SBJV.PST
 ‘If he uses more acres for his personal purpose, he should give and pay me approximately
 as much fruit into the barn as the same acres bore.’

Even if these examples do not involve an infinitive complement, both occurrences exhibit some parallels to the patterns with infinitive complements. On the one hand, they originate from the same period when *brauchen* started to take infinitive complements, as it will be indicated below in more detail. On the other hand, both of them occur in a negative environment. As it turns out, the subjunctive form *bräuchte* is already attested without infinitive complements in the 18th century. According to the earliest occurrences found in the investigation discussed here (359)–(360), it is very likely that *bräuchte* has developed independently from the infinitive complement. This is in strict contrast to the development of the IPP: until present day the IPP is excluded from transitive uses, even in East Bavarian dialects which are known to be rather generous in the use of the IPP, as it has been shown by Aldenhoff (1962, 199) and Ørsnes (2007, 131). This indicates that the morphological peculiarities of *brauchen* with an infinitive developed in distinct stages. As it will be shown below, *brauchen* is only attested with IPP around 1830. This is also the same period in which the first instances with bare infinitive complements occur. In brief, these facts cast further doubts on the assumption that the exceptional subjunctive form *bräuchte* has anything to do with the morphological peculiarities of the preterite presents, as it has been suggested by Kolb (1964, 74), Scaffidi-Abbate (1973, 32) and Girth (2000, 120). Their explanation would become even less plausible, if it turns out to be that the example (361) from the 16th century is valid. As far as the context is concerned, the example is perfect, all the other lexical verbs bear the subjunctive of the past endings as well: *grieffe* touch-SBJV.PST and *trügen* ‘bear-SBJV.PST’. For some mysterious reason, the irregular form *bräuchte* has been replaced by the regular one *brauchte* in the subsequent editions of this book from 1574 and 1577. An analogous case can be found in Moscherosch’s *Alamodischer Politicus* from 1647.

²⁸⁷Franz Berg, *Predigten über die Pflichten der höheren und aufgeklärten Stände by den bürgerlichen Unruhen unserer Zeit*. Würzburg: Stahel (1793), p. 54.

²⁸⁸Johann Peter Zwengel, *New Groß Formular und vollkommlich Cantzlei Buch von den besten und auferlesenen Formularien aller deren Schrifften/ so in Chur und Fürstlichen / auch der Grauen / Herren unnd anderen fürnemen Cantzleyen / Auch sonst in den Ampten unnd Ampts händeln / Deßgleichen under dem gemeinen Man / allerley fürfallendert geschäft halben / bräuchlich seindt – Reuerßbriefff vber bestandnen Bawhofs/sampt deren Güter* Frankfurt: Egenolffs Erben (1568), p. 158a.

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Once again, the *umlaut* is absent in the preceding edition from 1640.²⁸⁹

As long as the status is not confirmed, they will not be taken into further consideration. Yet, it deserves attention that the irregular form *bräuchte* is subject to criticism: as Grebe et al. (1966, 114) assess, the irregular subjunctive of the past *bräuchte* is not correct and has its origins in South German varieties. Similar judgements are found in the Duden dictionary for orthography edited by Scholze-Stubenrecht (2000, 245), in which it is argued that *bräuchte* is part of the colloquial language. Finally, the language purist Johannes Dornseiff pleads in his book published 2011 entitled *Sprache wohin?* for the replacement of the irregular subjunctive of the past *bräuchte* by the regular form *brauchte*.

One of the main morphological characteristics of preterite present verbs is that they do not involve a suffix in the present tense forms of the 1. and the 3. person singular, as it has been shown in Section 4.1.1. As Kiaulehn (1965, 52) notices, *brauchen* has lost its *-t*-suffix in the 3. person singular whenever it takes a (bare) infinitive complement in spoken German in Berlin. Likewise, Folsom (1968, 328 Fn. 84), Wurzel (1984, 117 & 149) and Birkmann (1987, 5) observe that the *-t*-suffix in the 3. person singular is about to disappear in other spoken varieties, as well. Furthermore, Scaffidi-Abbate (1973, 32) shows that the omission of the *-t*-suffix in the 3. person singular indicative is attested in the spoken varieties in Prussia, Rhineland and Palatine. As Girnth (2000) illustrates, the *-t* suffix of the 3. person singular *braucht* has also disappeared in many dialects from Rhineland. Furthermore, he argues that this loss of the suffix is due to a morphological process of approximation which *brauchen* undergoes. Exhibiting modal meaning, it is about to adopt a morphological form for the 3. person singular that corresponds to that of the six traditional modal verbs and which is spelled out as '*brauch*'. In contrast, Maitz and Tronka (2009, 192) point out that this loss has an independent phonological motivation, the loss of a dental plosive is also attested after a velar fricative in other words such as *nicht* 'not' → *nich*. As Maitz and Tronka (2009, 201) further illustrate, it is not excluded that this process could be amplified by the morphological factors discussed by Girnth (2000). In any case, the loss of the suffix *-t* in the third person singular is restricted to the spoken language of particular varieties.

The case of *need* in English exhibits a striking parallel. It has been already shown by Sweet (1891, 421) that *need* optionally drops the suffix *-s* in the 3. person singular indicative, preferably when used with an infinitive complement. Murray (1933, 71) could attest this pattern from 16th century. This causes Scaffidi-Abbate (1973, 32) to assume explicitly that the loss of the *-t*-suffix in the case of *brauchen* is to be considered as a process of morphological approximation toward the paradigm of preterite present verbs.

Another essential morphological characteristic of the six traditional modal verbs is the so-called *infinitivus pro participio* (IPP)-effect which has been already discussed in much detail in Section 4.1.1. As it has been shown, there is only a small group of verbs to which the IPP has to apply obligatorily, among them the traditional six modal verbs. As Kolb (1964, 76) and Schmid (2000, 331) point out, *brauchen* exhibits an obligatory IPP whenever it is used with an infinitive complement. In the corpus examples (362)–(363), the IPP form *brauchen* cannot be substituted by the *ge*-participle *gebraucht*.

²⁸⁹Johann Michael Moscherosch, *Alamodischer Politicus*, Cölln: Andreas Bingen (1640), p. 64.
Johann Michael Moscherosch, *Alamodischer Politicus*, Cölln: Andreas Bingen (1647), p. 56.

- (362) Faust hätte die beiden ja auch einfach gar nicht zu erwähnen
 Faust have-SBJV.PST the both PART also just INTN NEG to mention-INF
 brauchen.²⁹⁰
 need-PPP(ipp)
 ‘It was not necessary that Faust mentioned both of them.’
- (363) Da habe Blaich nur zuzugreifen brauchen.²⁹¹
 there have-SBJV.PRS Blaich only to.take-INF need-PPP(ipp)
 ‘In this situation, Blaich just needed to take it.’
- (364) die Regierung hätte das Buch gar nicht zu verbieten
 the government have-SBJV.PST the book INTN NEG to prohibit-INF
 brauchen, es wäre dennoch gelesen worden.²⁹²
 need-PPP(ipp) it is-SBJV.PST nevertheless read-PPP PASS.AUX-INF
 ‘It was not necessary that the government prohibited the book, it would have been read
 nevertheless.’
- (365) Nun eine solche hätte es auch gerade nicht zu seyn brauchen,²⁹³
 so a such have-SBJV.PST it also just NEG to be-INF need-PPP(ipp)
 ‘So, it was not necessary’
- (366) dem Soldaten hätt ich nicht einmal brauchen einen Schlaftrunk zu
 the soldier have-SBJV.PST I NEG once need-INF a sleeping.draught to
 geben, er wäre doch nicht aufgewacht.²⁹⁴
 give-INF he SBJV-PST yet NEG wake.up-PPP
 ‘It was not necessary to give the soldier a sleeping draught, he would not have woken up
 anyway.’

The earliest attested examples of *brauchen* exhibiting an IPP are from the early 19th century (364) and (365), the former has been provided by Sanders (1908, 101). At the same time, Grimm (1837, 949) acknowledges that *brauchen* with *zu*-infinitive is found with the IPP effect, his example is discussed in Section 4.1.1. In the section on the IPP, Grimm (1837, 168) declares that any verb that selects a *zu*-infinitive complement must not be combined with IPP-morphology. Interestingly, they nevertheless employ *brauchen* with an IPP in their collection of fairy tales (366). In contrast, the normative philologist Wustmann (1908, 61) argues that *brauchen* with *ge*-participle is *fehlerhaft* ‘wrong’ and *ungeschickt* ‘infelicitous’ as soon as it selects a *zu*-infinitive complement. Aldenhoff (1962, 196) and Kolb (1964, 77) report that a whole range of grammarians in the 18th century share Grimm’s opinion. As they furthermore argue, this assessment is almost correct, however, there is one verb that does not conform to this tendency: *brauchen*, which is frequently attested with *zu*-infinitives in this pattern. Likewise,

²⁹⁰DeReKo: RHZ09/MAI.19683 Rhein-Zeitung, 23.05. 2009.

²⁹¹DeReKo: BRZ07/MAI.18723 Braunschweiger Zeitung, 18.05. 2007.

²⁹²Heinrich Heine, *Reise nach Italien*, Abschnitt IV, in *Morgenblatt für Gebildete Stände*, N° 20, Mittwoch 3. December 1828, (1828) p. 1157.

²⁹³Carl Ullmann, *Theologische Studien und Kritiken*, volume II (1) Hamburg: Friedrich Perthes (1829), p. 176.

²⁹⁴Jacob Grimm and Wilhelm Grimm, *Die zertanzten Schuhe* in *Kinder und Hausmärchen. Große Ausgabe*, (1837), p.553.

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Askedal (1997a, 55) demonstrates that *brauchen* with *zu*-infinitive does not fulfil all the criteria required by the configuration in which the IPP usually occurs.

Today, it is generally acknowledged that *brauchen* can occur with the IPP despite its unexpected type of infinitive complement. How does this strange situation come about? As is evident, the driving force behind it is the semantic relation with *müssen* and the ancient pattern of *dürfen*. Interestingly, the IPP was not the only option for *brauchen* with *zu*-infinitive. Numerous instances of *brauchen* with *zu*-infinitives can be found that are realised as *ge*-participles. The earliest is dated to the late 18th century (367), the latest originates from the late 19th century (370), similar examples have been discussed by Sanders (1908, 101).

- (367) So unsäglich reich, daß er gleich 200.000 fl wegschenken kann,
so inexpressibly rich that he immediately 200.000 fl away.give-INF can
hätte vielleicht Herr Ifler auch nicht zu seyn gebraucht.²⁹⁵
have-SBJV.PST maybe Mister Ifler also NEG to be-INF need-PPP(ge)
'Mister Ifler did not need to be that inexpressibly rich that he could give away 200.000 fl at once.'
- (368) So hätte z. B. die Beschreibung des Zimmers in der Abtey, in
so have-SBJV.PST e. g. the description the-GEN room-GEN in the abbey in
welches Cordelia gebracht wird, für den Zweck des Dichters weit
which Cordelia bring-PPP PASS.AUX for the purpose the-GEN poet-GEN far
weniger umständlich zu seyn gebraucht.²⁹⁶
less cumbersome to be-INF need-PPP(ge)
'For example, the description of the room in the abbey in which Cordelia was brought did not need to be as cumbersome for the purpose of the poet.'
- (369) Man sieht sehr oft diese Pflicht ganz unrichtig an; als ob man verbunden sein
one sees very often these duties very incorrect on as if one obliged be-INF
könnte, dieses oder jenes, was man außerdem nicht zu tun gebraucht
could this or that what one besides NEG to do-INF need-PPP(ge)
hätte (etwa in die Kirche, zum Abendmahle gehen u. dgl.), um
have-SBJV.PST about in the church to.the supper go and the.like for
des bloßen guten Beispieles zu tun.²⁹⁷
the-GEN mere-GEN good-GEN example-GEN to do
'One very often deliberates about this duty in a wrong manner, as if one could be obliged to do something which was not necessary besides to do (e.g to go to church or the supper) just for the sake of being a good example.'
- (370) Eine blendende Art der Darstellung wäre mir wahrscheinlich
a splendid kind the-GEN description-GEN be-SBJV.PST me probably
gelungen, wenn nur nichts hinter derselben zu seyn gebraucht
suced-PPP if only nothing after it to be-INF need-PPP(ge)

²⁹⁵ Allgemeine Literatur Zeitung 57 20. Februar 1789, p. 456.

²⁹⁶ *Neue Bibliothek der schönen Wissenschaften und der freyen Künste* volume 53/1: *Adalbert der Wilde* by Friedrich August Müller. Leipzig Dyckische Buchhandlung (1794), p. 281.

²⁹⁷ Johann Gottlieb Fichte, *Das System der Sittenlehre* volume II, Leipzig Meiner (1798), p. 716.

hätte,²⁹⁸

have-SBJV.PST

‘I would have managed to deliver a splendid kind of description if it had not been necessary to write something after it.’

All of the occurrences listed above involve circumstantial modality. This does not seem to be obvious. The first two examples (367) and (368) are taken both from a review of a theatre play or novel, in which the reviewer criticises certain details of the work. In the investigation discussed here, *brauchen* with an infinitive complement is attested with a *ge*-participle in 1789 whereas the earliest occurrence of the variant with an IPP-effect dates to no earlier than 1829. This could lead us to the conclusion that the *ge*-participle was the original form which was replaced by the IPP in the course of the 19th century. Furthermore, it appears that *brauchen* with an infinitive complement was initially restricted to *zu*-infinitives. The first example of *brauchen* with a bare infinitive complement has been attested by Sanders (1908, 101) in the late 19th century (371):

- (371) ich hätt’ mich bloß nicht einmischen brauchen²⁹⁹
 I have-SCJV.PST REFL only NEG barge.in-INF need-PPP(ipp)
 ‘It was not necessary that I barged in.’

His example is taken from a novella written by Paul Heyse which talks about the life in the mountains around the Watzmann in Southern Bavaria. This occurrence of *brauchen* is part of a longer narration told by the character Sepp which should reflect the spoken language of the local people. However, it certainly does not correspond to the actual language use in this region. Nevertheless, this example indicates that *brauchen* with bare infinitive complement was considered as spoken language.

The use of *brauchen* with bare infinitive complement is not mentioned in grammars until the late 19th century. On the one hand, Wustmann (1896, 57) pejoratively considers *brauchen* without a *zu* as *gemeines Berliner Zeitungsdeutsch* ‘Common Newspaper German of Berlin’. In a later edition, Wustmann (1908, 61) chooses an even more drastic terminology: *Gassendeutsch* ‘Street-German’. On the other hand, Sanders (1908, 101) observes in a less subjective way that *brauchen* is occasionally used with a bare infinitive. Based on data from the late 19th century, he notices that *brauchen* can occur with a bare infinitive complement, in particular in spoken language. Interestingly, the example given above (371) involves an IPP which according to some grammarians at that period should only be used with verbs that take bare infinitive complements. Until today, the IPP is a property which dominantly occurs with verbs that select a bare infinitive complement. According to the scarce data presented here, the suspicion arises that the emergence of bare infinitive complements with *brauchen* is a consequence of the increasing use of the IPP. Obviously, the ability to realise an IPP acts as a threshold between auxiliary-like verbs and lesser grammaticalised verbs: once a verb with *zu*-infinitive develop a meaning that is close to the core-class of IPP verbs as it is defined by Schmid (2000, 328) it is likely to acquire the IPP effect as well. As soon as it has adopted this new property, there are two options. Either,

²⁹⁸Edmund Jörg und Franz Binder, *Historisch-politische Blätter für das katholische Deutschland* volume 26, München (1870), p. 237.

²⁹⁹Paul Heyse, *Auf der Alm* in: *Neue Novellen* volume 4, (pp.385–455) Berlin: Wilhelm Hertz (1862), p. 447.

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it drops the infinitival particle *zu* and begins to subcategorise bare infinitive complements such as *brauchen* or it loses the ability to realise its participle as IPP, as it is exemplified in the case of many other verbs that used to exhibit the IPP for a certain period such as *wissen* or *pflegen*. A more comprehensive collection is provided by Sanders (1908, 222) and Aldenhoff (1962), as is illustrated in Section 4.1.1.

In any case, all these speculations require a systematic survey of much data from the 18th and the 19th century. The absence of *brauchen* with bare infinitives in the data discussed could be due to the selection of texts. It may turn out that it was already used much earlier or that it was only used in spoken language. Moreover, it could be that grammarians prior to Sanders (1908, 101) and Wustmann (1908, 61) ignored *brauchen* with bare infinitive because it was considered as non-standard language. Yet, the latter conclusion is not very plausible as cf. Langer (2001) has demonstrated that grammarians of the 18th and the 19th century had a particular interest to fight against “bad language”. Accordingly, they were well informed about recurring non-conform uses of language.

Turning to the syntactic characteristics, it has already been mentioned that the six traditional modal verbs take bare infinitive complements. Some grammarians such as Jäger (1968, 332) only consider the use of *brauchen* with *zu*-infinitive complements acceptable. In contrast, Folsom (1968, 328) argues that *brauchen* without *zu* is fully acceptable. Other grammarians such as Sanders (1908, 101) advise to drop the infinitive particle *zu* in certain environments: (i) whenever the infinitive complement is topicalised and (ii) in cases in which *brauchen* itself is realised as a *zu*-infinitive, it is sufficient to only use one single infinitive particle *zu*. This corresponds roughly to the line adopted by the popular Duden grammar edited by Drosdowski et al. (1995, 395 Fn.1).³⁰⁰ This judgement is based on the assessment made of the same author in an earlier study, cf. Gelhaus (1969, 320). Likewise, the well respected Austrian writer Karl Kraus argued in the early 20th century that *brauchen* without *zu* should not be considered as incorrect. Furthermore, he notices that this option is even more appropriate in environments with more than one infinitive particle *zu*.³⁰¹

Turning to the investigation of the DeReKo corpus, it turns out that *brauchen* occurs with bare infinitives even in written language. Further instances have been found in works of fiction of high renown such as the pattern (379) taken from Franz Kafka’s *Verwandlung* (‘The Metamorphosis’). Note that none of the examples (372)–(382) refers to spoken language or reported speech, except the example (373) taken from Götzke and Mitka (1939, 411). The occurrences can be divided into four classes according to the type of environments in which they occur. First

³⁰⁰An extract from the original quotation:

Aus gründen des Wohlklangs (. . . *zu tun haben* statt . . . *zu tun zu haben*) und in der Emphase (*Wundern braucht man sich nicht!* wird *brauchen* auch standardsprachlich ohne *zu* vorgezogen)

English translation [J.M.]: *brauchen* is preferred in standard language without *zu* for reasons of euphony (. . . *zu tun haben* statt . . . *zu tun zu haben*) and in topicalisations (*Wundern braucht man sich nicht!* instead of *brauchen*).

³⁰¹Karl Kraus *Die Fackel*, März 1925 München: Kösel Verlag 2nd edition, p.265–266. The full quotation is as follows:

An und für sich ist *brauchen* ohne *zu* keineswegs falsch – das wurde nie behauptet –, es gibt Fälle, in denen es sogar vorzuziehen ist, eben wenn sich die *zu* häufen oder wo eine mehr mundartliche Färbung oder Veranschaulichung des abgekürzten Vorgangs intendiert ist.

of all, (i) *brauchen* with bare infinitive complements can be used if its infinitive complement is topicalised (372)–(375). Secondly, (ii) the particle *zu* is occasionally omitted in contexts in which the phonetic string *zu* occurs adjacent to the infinitive complement such as *allzu* ‘too’ (375) or *zur* ‘to.the’ (377) or *zugeben* ‘admit’ (382). Furthermore, (iii) *brauchen* without *zu* can be found in verb clusters that consist of at least three verbs (376)–(379). And finally, (iv) there are instances of *brauchen* with bare infinitive complements that exhibit the IPP (379)–(382). In some cases, these factors bundle: topicalisation and multiple *zu* (375), big verb clusters and IPP (379) and (381), multiple *zu* and IPP (382). As most of these examples involve a certain degree of morphological and syntactic complexity, most of the native speakers would not notice that these patterns do not correspond to the rules in normative grammars. In order to identify the influence of these four environments, they should be investigated with respect to other verbs that select *zu* infinitive complements. It appears that such verbs do not drop the *zu*-particle that easily.

- (372) Wandern braucht ihr nicht zum Süden, weil ihn ihr Gesang euch
wander-INF need you NEG to.the south because him her song you
bringt.³⁰²
brings
‘You do not need to wander to the South, as her song will bring it to you.’
- (373) Ja, totschiagen brauch’ ich ihn nicht, er verdient’s gar nicht³⁰³
yes strike.dead-INF need I him NEG he merits.it INTN NEG
‘Yes, I do not need to strike him dead, he does not merit it.’
- (374) Politiker müssen sich Kritik gefallen lassen, beschimpfen oder
politicians must REFL criticism please-INF let-INF insult-INF or
beleidigen lassen brauchen sie sich nicht.³⁰⁴
offend-INF let-INF need they REFL NEG
‘Politicians have to be able to deal with criticism, but they do not need to acquiesce to
insults and offenses.’
- (375) Allzu sehr grämen brauchen sich die Viertäler angesichts der Tabellenlage
all.too much worry-INF need REFL the Viertäler regarding the table.position
allerdings nicht.³⁰⁵
however NEG
‘However, the team from Viertel do not need to worry regarding their position in the table.’
- (376) Sei großmütig, da die Strafe in Deiner Hand liegt und Du nur mich
be-IMP noble as the punishment in your hand lies and you only me

³⁰²Friedrich Rückert, *Nachklang* in *Gedichte* (1841), p. 299. First published in *Morgenblatt für gebildete Stände* N° 243, *Mittwoch 10. October 1821* (1821).

³⁰³Willibald Alexis, *Der Werwolf* Berlin: Otto Janke, (1894) part I, chapter 9, p.89. First published in 1848.

³⁰⁴DeReKo: RHZ07/FEB.00452 Rhein-Zeitung, 01.02. 2007.

³⁰⁵DeReKo: RHZ08/MAR.20777 Rhein-Zeitung, 25.03. 2008.

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lange auf einen Antwortsbrief warten lassen brauchst.³⁰⁶
long for a answer.letter wait-INF let-INF need

‘Be noble, as the punishment lies in your hands and you only need to keep me waiting a long time for an answer.’

- (377) Aber was sicherlich nicht zur Diskussion gestellt werden braucht, ist
but what certainly NEG to.the discussion put-PPP PASS.AUX-INF needs is
die Tatsache, daß viele Dichter und Schriftsteller vom 19. Jahrhundert bis
the fact that many poets and writers from.the 19 century until
zum heutigen Tag das Verb ‘brauchen’ mit reinem Infinitiv anwenden.³⁰⁷
to.the present day the verb need with bare infinitive use
‘Yet, what certainly does not need to be discussed is the fact that many poets and writer
from the 19th century until the present day use the verb ‘brauchen’ with a bare infinitive
complement.’

- (378) Die Erkundungen ergaben, dass zwei Stollen nicht verfüllt werden
the explorations yielded that two adits NEG fill-PPP PASS.AUX-INF
brauchten.³⁰⁸
needed

‘The explorations have yielded that two adits did not need to be closed.’

- (379) so hätte noch keineswegs die Mutter für sie entreten
so have-SBJV.PST still by.no.means the mother for her advocate-INF
müssen und Gregor hätte doch nicht vernachlässigt
must-PPP(ipp) and Gregor have-SBJV.PST PART NEG neglect-PPP
werden brauchen.³⁰⁹
PASS.AUX-INF need-PPP(ipp)

‘Accordingly, the mother would not have by no means to have advocate her and Gregor
would not have needed to be neglected.’

- (380) Dabei hätte es soweit nicht kommen brauchen.³¹⁰
though have-SBJV.PST it so.far NEG come-INF need-PPP(ipp)
‘Though, it was not necessary that this happened.’

- (381) Eigentlich hätten die Aachener Bosch gar nicht gehen lassen
actually have-SBJV.PST the Aachenian Bosch INTN NEG go-INF let-INF
brauchen, denn sein dortiger Vertrag sah eine Auflösungsklausel
need-PPP(ipp) as his local contract envisage a cancellation
frühestens für 2014 vor.³¹¹
earliest for 2014 before

³⁰⁶Droysen’s letter to Heydemann 20th June 1840, as cited in Götzke and Mitka (1939, 411).

³⁰⁷August Scaffidi-Abbate ‘Brauchen’ mit folgendem Infinitiv, in: Muttersprache 83 (1973), p. 5

³⁰⁸DeReKo: BRZ07/JAN.17470 Braunschweiger Zeitung, 03.01. 2007.

³⁰⁹Franz Kafka, *Die Verwandlung*, (1916) p. 179 l. 3.

³¹⁰DeReKo: RHZ10/APR.12082 Rhein-Zeitung, 22.04. 2010.

³¹¹DeReKo: NUN10/JUN.01746 Nürnberger Nachrichten, 18.06. 2010

‘Actually, there was no need for the Aachenians to let Bosch go as his local contract did not envisage a cancellation before the year 2014.’

- (382) Dass er seine Bütt’ erst am Vortag geschrieben hat, hätte
 that he his vat.speech only at.the previous.day written has have-SBJV.PST
 er nicht offen zugeben brauchen.³¹²
 he NEG publicly admit-INF need-PPP(ipp)

‘It was not necessary that he admitted that he only wrote his polemic on the previous day.’

Interestingly, most of the occurrences were found in news papers from Eastern Austria and from Rhineland. Pfeffer (1973, 92) has already noticed that *brauchen* with bare infinitives is frequent in the spoken language of Austria and absent from the one in Switzerland. Based on some earlier data collected by Pfeffer, Kluempers (1997) comes to a similar conclusion. Whereas these uses are well attested for the 20th century, it is not obvious when this pattern emerged. Sanders (1908, 101), Götzke and Mitka (1939, 411) and Scaffidi-Abbate (1973, 5) provide a couple of occurrences taken from literature of the 19th century. However, a lot of them are taken from direct speech or dialogues that should reflect the use of the spoken language, such as (373). The earliest examples of *brauchen* in genuine written language that select bare infinitive complements are from the early 19th century. In the *Trübners Deutsches Wörterbuch*, Götzke and Mitka (1939, 411) provide two interesting occurrences: one involving a topicalisation (372) from 1821 and another one that contains a big verb cluster (376) from 1840. The claim put forth by Götzke and Mitka (1939, 411) that *brauchen* without *zu* can be already found in the collection of tales edited by the Brothers Grimm, could not be confirmed with the support of electronic corpora: such forms could neither be found in the version provided by the DeReKo corpus nor in the version accessible in the *Digitale Bibliothek Deutscher Klassiker*.³¹³

These examples indicate that there are environments in which a native speaker would not notice that *brauchen* is used without the infinitive particle *zu*. In contrast, a lot of speakers would not consider *brauchen* with a bare infinitive complement as prestige Standard German as soon as it occurs in other environments than the four discussed above.

As it has been illustrated at various occasions, *brauchen* has mostly adopted patterns that its predecessor *dürfen* had already established. In this respect, it is fairly astonishing that *dürfen* is attested with *zu*-infinitives in its old interpretation in the early 16th century, as Scaffidi-Abbate (1973, 26) has demonstrated referring to examples provided by the DWB (p. 1722), (383). This is fairly unexpected as all of the preterite present verbs already selected bare infinitive complements for several centuries. Does this mean that there are independent semantic reasons that prescribe the selection of the *zu*-infinitive?

- (383) nun sprichstu waz darf ich das zu biten, so ich doch daz on daz hab, dan
 now talk.you what need I that to beg-INF as I yet that and that have since
 ich bin reich³¹⁴
 I am rich

‘Now you talk, what necessitates me to beg for that? As I have this and that, as I am rich.’

³¹²DeReKo: NON10/JAN.05921 Niederösterreichische Nachrichten, 18.01. 2010

³¹³<http://klassiker.chadwyck.co.uk/deutsch/home/home>, last access 9th July 2012.

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‘Now you talk, why do I need to beg for that? As I have this and that, as I am rich.’

Note that configuration in example (383) is fairly reminiscent of the one in (356) and (358): it contains a causal use of the *wh*-pronoun *waz* and a verb that expresses a need. Similar examples with a causal *was* and *thurfan* are already attested in the Old High German Tatian, as the example provided by Scaffidi-Abbate (1973, 25) illustrates.

- (384) Uuaz thurfun uuir noh nu urcundono³¹⁵
what need we yet now witnesses
‘Why do we now yet need witnesses?’

This observation could be the crucial hint for an alternative explanation for the fact that *dürfen* could occur next to *zu*-infinitives.

Apart from the selection of bare infinitive complements, *brauchen* exhibits a further characteristic typical to the six traditional modal verbs. Just as volitional *mögen*, raising *wollen* and *dürfen* in the Early New High German period, *brauchen* with an infinitive is restricted to negative environments. This has often been observed. Crucially, as Paul (1897, 79) has already pointed out, this property also used to affect the new transitive uses of *brauchen*. As soon as transitive *brauchen* has referred to a need rather than to a usage, it was restricted to negative polar distributions. This is of particular interest, as the transitive use of the need related interpretation has lost this property in the course of time whereas *brauchen* with an infinitive complement continues to avoid positive environments. Bech (1951, 14), Kolb (1964, 73) and Lenz (1996, 399) have demonstrated that *brauchen* adopted in most respect the function of the original need verb *dürfen* including its negative polar orientation. Folsom (1968, 325) provides a comprehensive list of items that license a suitable negative polar environment for *brauchen*: explicit negation, particles that imply some sort of negation *nur* ‘only’, *kaum* ‘hardly’ and *erst* ‘(temporal) only’, subordinative conjunctions *ohne dass* ‘without that’ and polarity and *wh*-questions.

However, there are rare instances of *brauchen* that do not occur in negative polar environments. First of all, the negative polarity of *brauchen* poses a particular challenge for language learners. Due to an over generalisation, they assume that *brauchen* can also be used in positive contexts, as the examples produced by a L1-learner (385) and by the Turkish L2-learner Sevinc (386) provided by Vainikka and Young-Scholten (1994, 289) illustrate:

- (385) doch Papa das brauchst Du kaufen.³¹⁶
PART daddy that need you buy-INF
‘Oh yes, daddy you need to buy this.’
- (386) Jetzt brau Wohnungsamt fragen.³¹⁷
Now need housing.authority ask-INF
‘Now, I need to ask the housing authority.’

³¹⁴Geiler Keiserberg *sünden des munds*, 84a (1518), as cited in the DWB.

³¹⁵Tatian, 191,2 (830) as cited in Scaffidi-Abbate (1973, 25).

³¹⁶Utterance heard in a bookstore in Berlin in the year 2000, when a small child argued with his father.

³¹⁷As quoted in Vainikka and Young-Scholten (1994, 289).

Apart from that, Folsom (1968, 326) and Pfeffer (1973, 88) have collected instances that had been produced by native speakers of German. Whereas Folsom provides examples from the 19th century, Pfeffer discusses an example from Contemporary Spoken German (387). As Roland Schäfer (pers. commun.) has pointed out to me, *brauchen* is occasionally used in positive environments (388)–(389). According to his estimation, this appears to be a regional phenomenon of the spoken language in North Rhine-Westphalia.

- (387) Es brauchen immer so die sehr schwierigen Sachen zu sein³¹⁸
 it need always so the very difficult things to be-INF
 ‘It always has to be the very difficult things.’
- (388) Jeder Kinositzer braucht ein eigenes Bild berechnet zu bekommen, da die
 each cinema.sitter needs a proper picture calculate-PPP to get-INF as the
 Abstände vom Bild der einzelnen Besucher viel zu gravierend
 distances from.the picture the-GEN single-GEN visitor-GEN much too serious
 sind.³¹⁹
 are
 ‘It is necessary that each cinema goer gets an individually calculated picture as the distances from the picture of each visitor are too varied.’
- (389) Jetzt brauch ich meine Pillen nehmen, und dann geh ich ins Büro.³²⁰
 now need I my pills take and then go I in.the office
 ‘Now, I just need to take my pills and than I’ll go to the office.’

Since Folsom and Pfeffer have published their investigations, *brauchen* does not seem to have undergone any dramatic change in Standard German. Even if there was evidence that *brauchen* could spread to positive environments as well, it remained confined to negative polar distribution until the present day. And this is one of the big mysteries: why did the new transitive use of *brauchen* lose its negative polar behaviour, whereas *brauchen* with an infinitive is still confined to negative environments after two hundred years.

Apart from the selection of bare infinitives and the preference for negative polar environments, *brauchen* has another property that is typical to the six traditional modal verbs. As Folsom (1968, 324) and Askedal (1997a, 57) have demonstrated, *brauchen* can select VP-anaphora that refer to infinitives that are embedded by a traditional modal verb. Such patterns are well attested in the DeReKo corpus (390)–(391).

- (390) Das heißt, man kann eine direkte Patenschaft übernehmen, braucht es aber
 that means one can a direct sponsorship overtake-INF need VPANA but
 nicht?³²¹
 NEG

³¹⁸As quoted in Pfeffer (1973, 88).

³¹⁹Eternal thanks to Roland Schäfer who provided me this example found on 26th of January 2011 on the web:
<http://forum.golem.de/kommentare/audio-video/roger-ebert-us-filmkritiker-erklaert-den-3d-film-fuer-tot/was-3d-vor-allem-fehlt/48624,2629841,2629841,read.html#msg-2629841>

³²⁰Eternal thanks to Roland Schäfer who supplied me with this example produced by a 70 year old speaker from Southwestern Phalia. on 28th of March 2011.

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‘Does this mean that one can adopt a sponsorship, but one does not need to?’

- (391) Dass Chelseas Spieler-Trainer Gianluca Vialli seinem Captain selbst diesmal
that Chelsea-GEN player-manager Gianluca Vialli his Captain even this.time
Nachsicht versprochen hat, müsste eigentlich verwundern. Braucht es aber
clemency promised have should actually surprise-INF need VPAN but
nicht. Vialli und Wise sind Freunde.³²²
NEG Vialli and Wise are friends

‘It should actually surprise us that the playing manager Gianluca Vialli was even lenient towards his captain this time. However, it doesn’t need to. Vialli and Wise are friends.’

As it turns out, circumstantial *brauchen* behaves exactly like *müssen* with negation. Accordingly, it exhibits all of the essential raising diagnostics that have been introduced in Section 4.2.1 and 4.2.2. In the corpus, it is attested with the non-referential subject *es* ‘it’ (392)–(393) and with *de dicto* interpretations of quantifying NPs (394). It should not be relevant here whether *eines* is used as an indefinite pronoun or as a numerical determiner, as Carpenter (1998, 87) has pointed out that numerical determiners behave like ordinary existential quantifiers. Finally, the subject referent in (395) is not the target on which the obligation is imposed, as it would be expected for a control pattern.

- (392) Es braucht nicht überall Weisswürste und Bier oder «Züri-Gschnätzlets» zu
it need NEG everywhere white.sausage and beer or Züri-Gschnätzlets to
geben.³²³
give-INF

‘It isn’t necessary that Weisswurst, beer or Züri-Gschnätzlets is available everywhere.’

- (393) Vor dem Winter braucht es den Eichhörnchen nicht bang zu werden.³²⁴
before the winter need it the-DAT squirrel-DAT NEG afraid to become-INF
‘Before winter, the squirrel doesn’t need to be afraid.’

- (394) Von jeweils zwei Geschwistern braucht nur eines Eintritt zu bezahlen.³²⁵
of each two siblings need only one entrance.fee to pay-INF
‘Only one out of two siblings has to pay the entrance fee.’

- (395) Bei Grippe muss unter allen Umständen das Bett gehütet werden –
with influenza must under all circumstances the bed tend-PPP PASS.AUX-INF
es braucht nicht das eigene zu sein.³²⁶
it need NEG the own to be-INF

‘In case of influenza, it is necessary to stay in bed under any circumstance – it does not need to be the own one.’

³²¹DeReKo: M00/DEZ.79640 Mannheimer Morgen, 20.12. 2000.

³²²DeReKo: 99/FEB.03243 Zürcher Tagesanzeiger, 05.02. 1999.

³²³DeReKo: E00/JAN.01750 Zürcher Tagesanzeiger, 20.01. 2000.

³²⁴DeReKo: RHZ96/NOV.14124 Rhein-Zeitung, 22.11. 1996.

³²⁵DeReKo: NON09/MAR.11321 Niederösterreichische Nachrichten, 18.03. 2009.

³²⁶DeReKo: NUZ06/FEB.03100 Nürnberger Zeitung, 27.02. 2006.

Finally, raising predicates are transparent with respect to voice. If *brauchen* was a control verb, it would be expected that the target of the obligation would be always the subject referent, as any control verb determines the main semantic relations by means of assigning thematic roles. Involving different subjects, the sentences (396a) and (114b) should accordingly refer to different state of affairs. However, they differ: in the active example (396a) the subject is the underlying AGENT argument *der Reinhold*, whereas the subject is identified with the underlying THEME argument *der Nanga Parbat* in the passivised instances. If *brauchen* involved a proper subject argument, the obligation should be imposed on *Reinhold* in (396a) and on the *Nanga Parbat* in the passivised example (396b). This is not the case, *brauchen* has to involve a raising pattern, thus.

- (396) a. Der Reinhold braucht den Nanga Parbat nicht ohne Sauerstoffgerät
 the Reinhold must the-ACC Nanga Parbat NEG without oxygen.apparatus
 (zu) bezwingen.
 to conquer
 ‘Reinhold has to conquer the Nanga Parbat without oxygen apparatus’
- b. Der Nanga Parbat braucht vom Reinhold nicht ohne
 the-NOM Nanga Parbat must by.the Reinhold NEG without
 Sauerstoffgerät bezwungen (zu) werden.
 oxygen.apparatus conquer-PPP to PASS.AUX-INF
 ‘The Nanga Parbat has to be conquered by Reinhold without oxygen apparatus’

Just as *müssen* in the scope of a negation, negative polar *brauchen* can act as a quantifier over individuals, yielding quantificational interpretations in the sense of Carlson (1977, 119) and Brennan (1993, 96). In (397), *nicht müssen* serves as a negated universal quantifier over individuals ($\neg\forall$). It expresses that in the set of people with cancer there is at least one person whose fate is not hopeless. The ensuing examples (398)–(403) behave in parallel way.

- (397) Ein Leben mit Krebs braucht nicht hoffnungslos zu sein.³²⁷
 a life with cancer need NEG hopeless to be-INF
 ‘A life with cancer does not need to be hopeless.’
- (398) Was umweltfreundlich ist, braucht noch lange nicht menschenfreundlich zu
 what eco.friendly is need still long NEG charitable to
 sein.³²⁸
 be-INF
 ‘What is ecologically friendly, does not need to be charitable.’
- (399) Und der Prager Komponist Petr Eben hat vorgeführt, daß Musik im
 and the Prager composer Petr Eben has demonstrated that music in.the
 Riesenraum nicht zwangsläufig plakativ zu sein braucht.³²⁹
 giant.space NEG inevitably blatant to be-INF needs

³²⁷DeReKo: A98/MAR.13892 St. Galler Tagblatt, 06.03. 1998.

³²⁸DeReKo: N93/MAR.07932 Salzburger Nachrichten, 03.03. 1993.

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‘And Prague’s Composer Petr Eben has demonstrated that music in the giant space does not need to be blatant.’

- (400) Nicht jeder, der vielleicht ein guter Lebenshelfer ist, braucht auch ein guter
NEG everyone who maybe a good life.helper is needs also a good
Schriftsteller zu sein³³⁰
writer to be-INF

‘Not everybody who is maybe good at giving advise need to be a good writer.’

- (401) Teurere Produkte brauchen nicht zwangsläufig besser zu sein, aber oft ist
expensive products need NEG inevitably better to be-INF but often is
der höhere Preis auch ein Zeichen grösserer Qualität und eines besseren
the higher price also a sign bigger-GEN quality-GEN and a-GEN better-GEN
Services.³³¹
service-GEN

‘Expensive products do not need to be inevitably better, yet, a higher price often indicates a higher quality and a better service.’

- (402) bei dieser Gelegenheit hatte er, sowohl mit sich selbst als mit Serlo und
at this occasion had he both with REFL self as with Serlo and
Aurelien, die Frage oft abgehandelt, welche ein Unterschied sich
Aurelia-DAT the question often dealt which a circumstance REFL
zwischen einem edlen und vornehmen Betragen zeige, und inwiefern jenes
between a noble and distinguished conduct shows and to.what.extent this
in diesem, dieses aber nicht in jenem enthalten zu sein brauche.³³²
in that that yet NEG in this contain-PPP to be-INF need-SBJV.PRS

‘On this occasion, he had often discussed the question with himself on the one side and Serlo and Aurelien on the other side to which extent there is a difference.’

- (403) In der Sprache der Kinder und der Geisteskranken
in the language the- children-GEN and the-GEN mentally.ill.persons-GEN
erscheint ein Inf., der nicht elliptisch zu sein braucht, als allgemeine
appears an infinitive that NEG elliptically to be-INF needs as general
Form, die die anstrengende Ausprägung bestimmter logischer Beziehungen
form that the exhausting specification certain-GEN logical-GEN relation-GEN
nicht erfordert.³³³
NEG requires.

‘In the language of children and mentally ill persons, an infinitive appears that does not need to involve an ellipsis, being a general form that does not require the exhausting specification of certain logical relations.’

³²⁹DeReKo:N93/OKT.39664 Salzburger Nachrichten, 30.10. 1993.

³³⁰A00/APR.27086 St. Galler Tagblatt, 20.04. 2000.

³³¹DeReKo:97/JUN.09921 St. Galler Tagblatt, 17.06. 1997.

³³²DeReKo: GOE/AGM.00000 Goethe: Wilhelm Meisters Lehrjahre, [Roman], (Erstv. 1795–1796), p. 352.

³³³Behagel, Otto *Deutsche Syntax II*, (1924) p. 364.

As the example (402) taken from the 18th century indicates, the quantificational interpretations of *brauchen* seem to have already been available right after the period when it had acquired the infinitive complement.

Raising directionals with event modification

As already shown by Welke (1965, 15), Folsom (1968, 323), Askedal (1997a, 57) and Szumlakowski (2010), *brauchen* is also attested with verbless directional phrases. In this respect, it behaves exactly like *müssen*. As both examples involve inanimate subjects, an ellipsis account towards verbless directional phrases does not seem to be very likely, as it has been illustrated in much detail in Section 4.2.1.

- (404) Das Fahrrad braucht nicht zum TÜV.³³⁴
 the bike need NEG to.the TÜV
 ‘The bike does not need to be sent to the Technical Control Board (to get a good vehicle test certificate)’
- (405) Dieser Wagen paßt auf Anhieb, er braucht nicht in die Änderungsschneiderei.³³⁵
 the car fit at first.go he need NEG in the alteration.tailor
 ‘This car fits at first go, it doesn’t need to be send to the alteration tailor.’

Like its counter part with an infinitive complement, *brauchen* remains to be a negative polarity item in this use. In this regard, it is much reminiscent of the negative polar uses of the raising pattern of *wollen* and the volitional use of *mögen* which continue to be negative polar whenever they are employed with a verbless directional phrase complement.

Subject-to-object Raising infinitives

At least in some varieties such as Viennese, *brauchen* can be used as a subject-to-object raising verb. As it turns out, it imposes strict selectional restrictions on the infinitive which has to be a stative locative verb such as *liegen* ‘lie’, *sitzen* ‘sit’ or *stehen* ‘stand’. In that respect, it much resembles other subject-to-object raising verbs such as *haben* and the relinquative use *lassen* and the subject-to *bleiben*, as it has been illustrated by Maché and Abraham (2011, 260):

- (406) I brauch di da jetzt net deppat umanand sitzn.
 I need you-ACC there now NEG stupid around sit-INF
 ‘It doesn’t help me if you sit around here now.’

Interestingly, the subject-to-object raising pattern is negative polar just as the subject-to-subject raising pattern with *zu*-infinitive is.

³³⁴DeReKo: RHZ09/JAN.18261 Rhein-Zeitung, 24.01. 2009.

³³⁵DeReKo:RHZ97/AUG.13358 Rhein-Zeitung, 23.08. 1997.

Raising infinitives with clause modification

It is fairly contested to which extent *brauchen* can exhibit an epistemic interpretation. On the one hand, there are authors such as Folsom (1968, 328) and Öhlschläger (1989, 8) who contest the existence of such an interpretation. On the other hand, Raynaud (1977, 22), Takahaši (1984, 21), Zifonun (1997, 1278), Askedal (1997a, 62) and Kluempers (1997, 101) provide examples attested in corpora which they consider to be epistemic. At the same time, most of them concede that such an interpretation occurs fairly rarely with *brauchen*, except Takahaši (1984, 21).

In the past decades, a couple of instances of *brauchen* with an infinitive complement have been collected that come into consideration for an epistemic interpretation. Takahaši (1984, 21) discusses (407), Vater (2010, 108) considers *brauchen* in (408) as epistemic and Folsom (1968, 323) provides (409) and (410). Interestingly, he does not notice that they can plausibly be interpreted in an epistemic manner. It was only Takahaši (1984, 21) who has noticed that they can be interpreted epistemically. Likewise, Askedal (1997a, 62) remarks that Folsom's example (409) is most likely to be an epistemic instance of *brauchen*.

- (407) Das braucht nicht der Fall zu sein.³³⁶
that need PART NEG the case to be-INF
'That doesn't really have to be the case.'
- (408) Das braucht nicht zu stimmen.
this need NEG to be.right-INF
'That doesn't have to be correct.'
- (409) Es braucht nicht unbedingt ein Irrtum des Computers gewesen zu sein.
it need NEG necessarily a error the-GEN computer-GEN be-PPP to be-INF
'It does not need to have been an error by the computer.'
- (410) Ebenso braucht nicht unbedingt sie die Eintrittskarte in Iesolo verloren zu haben.
likewise need NEG necessarily she the ticket in Iesolo lose-PPP to have-INF
'Likewise, it does not need to be her who has lost the ticket in Iesolo.'

Do the instances given above indeed involve epistemic modal operators? As far as their distribution is concerned, these examples behave like typical epistemic modal verbs. These instances of *brauchen* embed predicates that refer to states that cannot be changed (407)–(408) and predicates that refer to events in the past (409)–(410), just as genuine epistemic modal verbs do. Moreover, *brauchen* in the examples above is subject to the CoDeC: the speaker labels the embedded proposition as a proposition that is not part of his confirmed knowledge. Thus, they are not compatible with assertion of the same proposition.

As investigation of the DeReKo corpus has revealed, the number of attested corpus examples is fairly limited. The retrieval strategy has been designed as follows. In her own small corpus study investigating 6000 modal verbs, Raynaud (1977, 22) has found out that 90% of the epistemic modal verbs embed the stative predicate *sein*. Furthermore, Heine (1995, 23)

³³⁶H. Gipper, *Sprachwissenschaftliche Grundbegriffe und Forschungsrichtungen*, 1978.

demonstrates that infinitive perfect complements strongly favour an epistemic interpretation. According to the frequencies documented by Ruoff (1981), the stative predicates *sein* and *haben* make up together almost 50% of the verbs used in his corpus. Thus, if *brauchen* does not occur in an epistemic interpretation with any of these stative predicates, it is not very likely that it occurs as an epistemic modal verb at all.³³⁷ The study presented here has focussed on instances of *brauchen* that co-occur with the negation *nicht* and the verbs *sein* or *haben*. Both verbs can either occur as stative predicate or perfect tense auxiliary which is of course part of the infinitive perfect.

The first query for *brauchen* that selects the complement *zu haben* yielded 768 hits. Far more than 80% of these occurrences, were variations of the pattern *nicht Angst zu haben brauchen* ‘it is not necessary to be afraid’, in which the noun *Angst* can be replaced by a semantical related noun such as *Sorge* ‘worry’, *Befürchtungen* ‘fear’, *Respekt* ‘respect’, *Ekel* ‘disgust’, *Scheu* ‘timidity’, *schlechtes Gewissen* ‘bad conscience’. Of course, all these examples do not come into consideration for an epistemic interpretation. In the most typical case, they are employed as direct or indirect advise.

Surprisingly, there are only two occurrences out of 768 that display a clear epistemic interpretation: (411) and (412). Apart from them, there are just a couple of cases that could turn out to be epistemic as well. Yet, the distributions are too ambiguous to determine the precise interpretation.

- (411) Was den Ort Xanten als Ort der Sage betrifft, so ist Norbert
 what the village Xanten as location the-GEN myth concerns so is Norbert
 Lönnendonker der Auffassung, dass das Santen des
 Lönnendonker the-GEN opinion that the Santen the-GEN
 Nibelungenliedes nicht am Niederrhein gelegen zu haben braucht³³⁸
 Nibelungenlied-GEN NEG at.the Lower.Rhine lie-PPP to have-INF needs
 ‘As for Xanten as the location of the myth, Norbert Lönnendonker believes that the village
 Santen appearing in the Nibelungenlied was not necessarily located at the Lower Rhine.’
- (412) Wir haben die Telekom längst gebeten, vor Ort nachzusehen. Das braucht
 We have the Telekom long.ago asked at place after.to.look-INF this need
 Herr Kunz gar nicht gemerkt zu haben, weil der Techniker dafür
 Mister Kunz INTN NEG notice-PPP to have-INF because the technician therefore
 nicht unbedingt ins Haus muss³³⁹
 NEG necessarily into.the house must
 ‘We already asked the Telekom company to check his connection long ago . Mister Kunz
 does not have to have necessarily noticed it because the technician does not need to enter
 the house to do so.’

³³⁷The investigation has been carried out on April 22th 2010. The first query `&brauchen /s0 "nicht" /s0 zu haben` yielded valid 768 results and the second query `&brauchen /s0 "nicht" /s0 zu sein` yielded valid 1683 results.

Of course, this query does not extract all the negative polar interpretation of *brauchen*. But as *nicht* is by far the most frequent negative operator, this study has ignored the lesser frequent ones for the sake of simplicity.

³³⁸DeReKo:WPD/SSS.10575, Wikipedia – URL:<http://de.wikipedia.org>: Wikipedia, 2005.

³³⁹DeReKo:NUN06/NOV.02580 Nürnberger Nachrichten, 23.11. 2006.

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As regards the other investigated predicate *sein*, the situation is not very different. As the study has revealed, there are only a couple of occurrences out of 1683 that can be taken into consideration for epistemic interpretation. And in a lot of instances, it is hard to determine whether *brauchen* exhibits an epistemic or quantificational reading.

- (413) gäbe es keine im weiten Sinn wirtschaftlichen, international
give-SBJV.PST it no in.the broader sense economically internationally
verträglichen, umweltverträglichen und sozialverträglichen Technologien, so
reconcilable biocompatible and social.compatible technologies so
wäre die industriegesellschaftliche Entwicklung in eine Sackgasse
be-SBJV.PST the industry.social development into a blind.alley
geraten. Dies aber braucht unseres Erachtens nicht der Fall zu sein.³⁴⁰
got this but need our consideration NEG the case to be-INF
'If there were no technologies that were economically and internationally reconcilable, bio-
compatible and socially compatible in the broader sense, the development of the industrial
society would have reached a blind alley. According to our estimation, this does not need
to be the case.'
- (414) Der „Outer“, wie man klar erblickt, ist nunmehr regelrecht verrückt. Denn
the outer as one clearly sees is now downright crazy as
was er sagt, gesteht er ein, braucht überhaupt nicht wahr zu sein³⁴¹
what he says confesses he in need at.all NEG true to be-INF
'The outer has become downright crazy, as one can clearly see. As what he says doesn't
need to be true at all anymore; as he confesses.'

It is fairly surprising that epistemic *brauchen* almost never occurs in environments in which epistemic modal verbs are usually more frequent than circumstantial modal verbs. This unexpected behaviour calls for an explanation. The instances of epistemic *brauchen* here differ from canonical epistemic modal verbs in two respects: (i) they select *zu* infinitive complements rather than bare infinitive complements and (ii) they are restricted to negative environments. According to Reis (2001, 307, 312 Fn. 39; 2005a, 112), the canonical type of infinitive complements for epistemic verbs in German is the bare infinitive. Thus, she would expect that *zu*-infinitives inhibit an epistemic interpretation. This could explain why so few occurrences could only be found in the corpus. In correspondence, another investigation needs to be conducted in which *brauchen* selects bare infinitive complements. As they do not occur in written language so frequently, this is no simple task.

Alternatively, the low frequency of an epistemic interpretation could be caused by the presence of a negation. As it will be discussed in more detail in Section 6.10, a lot of authors consider the scope of a negation an environment in which an epistemic operator must not occur. In a similar manner Askedal (1991, 9; 1997a, 62), argues that this context is not a suitable distribution in which *brauchen* can develop an epistemic interpretation without restriction.

³⁴⁰DeReKo:H86/UZ3. 20139 Die Zeit, 28.03.1986.

³⁴¹DeReKo:O95/SEP.86494 Neue Kronen-Zeitung, In den Wind gereimt, 02.09. 1995.

In order to determine which of these approaches is the correct one, it is fruitful to make a contrastive study with *müssen* in the scope of a negation. In this section, it was seen that the two necessity verbs with negation behave almost identically in semantic respect.

In case, it should turn out that epistemic *müssen* in the scope of a negation is equally rare with the stative complements *sein* and *haben*, the suspicion arises that it is the negation that inhibits the occurrence of epistemic interpretations. In case, epistemic *nicht müssen* occurs much more frequently under these conditions, the infinitival particle *zu* can be held responsible for the low frequency of epistemic (*nicht*) *brauchen*.

Summing up, the position defended by Takahaši (1984), Askedal (1997a) and Reis (2001) can be confirmed by and large: *brauchen* is attested with an epistemic interpretation. However, the number is much smaller than it is expected. Accordingly, *brauchen* can be considered as a verb with a marginally developed epistemic interpretation.

Finally, it will be shown that the epistemic reading of *brauchen* is not a recent development. There are already occurrences in the late 18th century, as is indicated in (415)–(416):

- (415) Es läßt sich als ausgemacht annehmen, daß die edleren Obstsorten, welche
 it let REFL as agreed assume-INF that the precious fruits which
 niemals wild wachsend gefunden, sondern allezeit unter menschlicher Wartung
 never wild growing found but always under human attention
 und Pflege erzeugt werden von einer gemeinen und wilden Mutter
 and care produced are from a common and feral mother
 herstammen, welche nachmals durch die Länge der Zeit, mit Hülfe
 stem which later through the length the-GEN time-GEN with help
 menschlichen Nachdenkens, Kunst und Fleißes, ihre Zucht veredelt und
 human-GEN reasoning-GEN, art-GEN and effort-GEN their growth cultivated and
 an Figur, Farbe, Geschmack, Geruch und Größe verändert hat. Dieser
 on shape colour taste smell and size changed has this
 Mutterbaum, obgleich wild, hat doch, wenn er unter einem milden Luftstriche
 mother.tree, even.if feral has yet if he under a mild air.flow
 stand, nicht so herbe und widrig zu seyn gebraucht, wie die Aepfel,
 stood NEG so harsh and contrarious to be-INF need-PPP(ge) as the apples
 welche unsre nordischen Waelder erzeugen.³⁴²
 which our Nordic forests produce

‘It is commonly assumed that the fruit trees which have never been found feral in nature but which were always produced under human attention and care originate from a common and feral mother. Consecutively, they have been cultivated their growth supported by human reasoning, art and effort. Thus, they changed their shape, colour, taste, smell and size. This mother tree does not need to have been as harsh and contrarious as the apples that grow in our Nordic forests.’

- (416) Aber es wird nun ein Mahl als ausgemacht angenommen, das Ganze,
 But it PASS.AUX now a time as agreed assumed the ensemble

³⁴²Peter Jonas Bergius *Von Obstgärten und deren Beförderung in Schweden* Leipzig: Gräffische Buchhandlung (1794), p. 40.

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woraus die sogenannten Fragmente sind, habe nur ein einziges
where.from the so-called fragments are have-SBJV.PRS only a single
Buch betragen, und zwar habe es kein Größeres zu seyn gebraucht,
book amount and indeed have-SBJV.PRS it no bigger to INF need-PPP(ge)
als das zweyte Buch von Gajus.³⁴³
as the second book by Gajus
'It is taken for granted that the ensemble from which the so-called fragments originate only
made up a single book and it does not need to have been more voluminous than Gajus'
second book.'

These occurrences merit closer attention in several respects: Firstly, they involve an epistemic modal verb that is realised as a past participle. As it will be shown in Section 6.2, such environments for an epistemic modal verb may seem awkward from the perspective of a contemporary native speaker of German. Most authors do not accept such patterns. However, in Spanish and French this pattern is the most natural one. Accordingly, we could assume that epistemic past participles were possible in earlier stages of German as well. And, indeed, it will be shown in Section 6.2 that there are other verbs that could be employed in an analogous manner. Secondly, the past participle is still realised as a *ge*-infinitive rather than as a IPP. This illustrates that the form does not play the major role in the development of an epistemic interpretation. Finally, it is fairly interesting that *brauchen* had developed an epistemic variant already more than two centuries ago and that its frequency has not increased until the present day.

Brief sketch of the development of *brauchen*

Based on the scarce evidence this investigation here could gather, the following scenario is the most likely. This development can be divided into four phases.

Phase I – until 1650. As it has been illustrated by Adelung (1793, 1162), Paul (1897, 79), Kolb (1964, 65) and Scaffidi-Abbate (1973, 5), the transitive verb *brauchen* used to refer to the usage of something until the 17th century. Then, it acquired a new interpretation and could express a need for something. In both variants, the verb selected either a genitive NP or an accusative NP. Crucially, the new variant of transitive *brauchen* started out as a negative polarity item, as it has been illustrated by Paul (1897, 79). According to Scaffidi-Abbate (1973, 5) and Reis (2005a, 106), the new meaning of *brauchen* was the crucial condition that facilitated the selection of infinitive complements.

Phase II – 1650–1700. *brauchen* acquires an impersonal pattern. It is likely that this development was caused by language contact with the French pattern *il faut* 'it is necessary ...'. Furthermore, it is plausible to assume that the availability of a variant without referential subject argument facilitated the development of a raising pattern. Grimm and Grimm (1860, 318) provide an example in the DWB that could reveal the precise development of *brauchen* cf. (417).

(417) es braucht nun gezeigt zu werden, dasz dieser prinz einer solchen
it needs now show-PPP to PASS.AUX-INF that this prince a such

³⁴³Gustav Hugo *Beyträge zur civilistischen Bücherkenntnis der letzten vierzig Jahre* Berlin: August Mylius (1829), p. 646.

abscheulichkeit fähig war.³⁴⁴

hideousness able was

‘It is only necessary to demonstrate that this Prince was capable of committing such a hideousness.’

It deserves closer attention that *brauchen* in the example given above is not a negative polarity item. Furthermore, it subcategorises the non-referential subject *es*. These facts indicate that this example most probably involves the impersonal pattern of *brauchen*. Whereas the object argument is usually realised by a genitive or accusative NP, it possibly surfaces here as an infinitive complement. This assumption gains additional support, as Grimm and Grimm (1860, 318) give another example of impersonal *brauchen* that selects a finite *clause* as its object argument instead of a NP. Likewise, Kluempers (1997, 21, 87) considers the impersonal use of *brauchen* as the starting point of its grammaticalisation – even if he assumes that this use is already an instance of subjectification.

Phase III – 1700–1800. In the early 18th century, *brauchen* is attested for the first time with a *zu*-infinitive complement. In this phase, *brauchen* with an infinitive realises its past participle as a *ge*-participle. In the same period, the irregular subjunctive of the past form *bräuchte* is already attested. As it appears, *brauchen* had already developed the full range of functions by the end of the 18th century: it could be used as a quantificational modal verb and as an epistemic modal verb. It is in the end of phase III, when *brauchen* with *zu*-infinitive has been mentioned by a grammarian for the first time, namely Adelung (1793, 1162). As Kolb (1964, 75), Welke (1965, 75) and Scaffidi-Abbate (1973, 24) point out, *müssen* is not frequently used with a matrix negation – accordingly, another element became necessary that was suitable to fill the gap left by *müssen*. This observation is in conflict with the corpus study conducted by Brüner (1979, 82). In her corpus of spoken language, she has found 525 occurrences of *müssen* without a negation and 20 occurrences in the scope of a negation. As regards *nicht brauchen*, it is attested 27 times. According to her perspective, negated *müssen* occurs more often in relation with *können* or *müssen* without negation.

Phase IV – 1800. Finally, *brauchen* started to realise its past participle as an IPP. At this point, *brauchen* is not attested with a *zu*-infinitive yet. At the same time, Grimm (1837, 168, 949) notices that the IPP is a property that is restricted to verbs that take bare infinitives. Thus, it should be applied to *brauchen* which selects *zu*-infinitives. Simultaneously, the first uses with *brauchen* with bare infinitive occur. In the late 19th century, the normative philologist Wustmann (1908, 61) refutes this as it is incorrect German according to his perspective.

As there were similar verbs in neighbouring languages that were already more grammaticalised before *brauchen* started its development, it is likely that the development of *brauchen* is a result of language contact. Murray (1933, 71) illustrates that *need* the English counterpart of *brauchen* has developed into an modal auxiliary-like verb much earlier. First of all, it could be used in an impersonal pattern already in the 14th century. Moreover, *need* is already attested from the late 14th century with *to*-infinitives and from the late 15th century with a bare infinitive complements. In the 16th century, it started to lose the *-s*-suffix in the 3. person singular. Some

³⁴⁴Friedrich von Schiller : Werke II 54 Band Geschichte des dreissigjährigen kriegs, zweyter teil, Carlsruhe Bureau deutscher Klassiker (first edition 1792) 1823), p 137.

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of these developments are illustrated by the examples taken from Murray (1933, 71). A similar observation has been made by Denison (1993, 296).

(418) How prejudicial such proceedings are . . . need not be defined.³⁴⁵

(419) My stooping need not to have disturbed you.³⁴⁶

The emergence of negative polar *need* in late Middle English appears to be related to development of the necessity modal verb *must*. This contemporary use of that latter verb merits attention for two reasons: in morphological respect, *must* is the former past form of the possibility verb *mote* which has acquired a present meaning which has subsequently developed a paradigm on its own. In this aspect, it has undergone a development that is fairly similar to the one of the preterite presents and the former subjunctive of the past *möchte*. Secondly, it has changed its modal force in the course of its development. Whereas *mote* originally used to refer to a possibility, the new form *must* can only be employed as a necessity modal verb in Modern English. Thirdly, it displays an idiosyncratic behaviour with respect to the scope of the negation. In contrast to the other modal verbs in English, a negated form *must not* is interpreted with a narrow scope interpretation ($\Box\neg p$). Accordingly, the negation of a necessity ($\neg\Box p$) cannot be expressed by a modal auxiliary in English. This explains finally why there is gap in the paradigm for a new specialised modal verb: *need not* which is used to negate a necessity.

This scenario is supported by the data provided by Murray (1933, 791). The new modal auxiliary *must* with present meaning is attested from the 14th century. The old possibility readings of *mote* were in use until the 15th century, whereas the first necessity readings developed in the 11th. The narrow scope interpretation of *must not* is at least attested until the 16th century. A similar perspective is given by Kaita (2012, 394).

The role of influence of foreign languages is once again highlighted by a pattern familiar from French. The verb *faillir* ‘need’ is attested with an impersonal pattern from the 14th century. These circumstances make an influence from foreign languages very plausible.

Kluempers (1997) provides an alternative path of development. But as he only grounds his theory on a couple of examples taken from the DWB, his account lacks empirical justification.

4.2.10 *werden*

The first to suggest a modal analysis for *werden* is Vater (1975), although Bauer (1870, 157 §164 Fn.) has already argued in a footnote that future tense can have modal meanings as well exemplified by an epistemic use of *werden*. He is inclined to consider *werden* generally as marker for a (future) probability. In contrast, Vater (1975, 110) has noticed that *werden* exhibits an epistemic interpretation that is analogous to the one that is typical for the traditional modal verbs. Likewise, the English counterpart *will* exhibits an epistemic reading as well. Accordingly, Brennan (1993, 97) and Enç (1996, 356) have adopted a modal account for the English future auxiliary which can be analysed as a necessity modal. As Bres and Labeau (2012) illustrate, this holds for the French future auxiliary *aller* ‘go’ with bare infinitive complement as well.

³⁴⁵Richard Morris *An essay in defence of ancient architecture* p. 90, (1728), as cited in Murray (1933, 71).

³⁴⁶Thomas Hull *The story of Sir William Harrington* II, 9 (1771), as cited in Murray (1933, 71).

In contrast to the six traditional modal verbs, *werden* does not exhibit any interpretation that could be considered as a circumstantial modal one. Accordingly, Öhlschläger (1989, 8) and Reis (2001, 312) do not regard it as a full member of the class of modal verbs. Instead, *werden* involves two other auxiliary-like functions. First of all, it can be used as a copula with an ingressive or inchoative interpretation taking predicative complements. Moreover, it functions as a passive auxiliary that selects past participle complements. Furthermore, it is used as future auxiliary with bare infinitive complements. Finally, it can be employed as an epistemic modal verb that selects bare infinitive complements as well.

Predicative phrases

As Steinitz (1999, 145) and Eisenberg (2004, 85) illustrate, *werden* ‘get’, ‘become’ is used as a copula verb which is similar to *sein* ‘be’, but specified for an ingressive or inchoative meaning. It takes a predicative complement that is typically realised as an adjective such as *kühl* ‘cool’ (420) or as a NP such as *ein echter Test* ‘a true test’ (421). Moreover, it can be realised as a directional phrase such as *aus dem Einbrecher* ‘out of the burglar’ or *zum Paradies* or ‘into the paradise’ (424) – this relativises Maienborn’s (1994, 232) generalisation according to which directional phrases are generally no licit complement for copulas. Apart from that, it turns out that the copula *werden* can select non-referential subject NPs. This indicates that it is a raising predicate. Similar observations for other copula constructions have been made by Pollard and Sag (1994, 147) and Müller (2002, 72; 2009, 217; 2013, 7):

- (420) In der kommenden Nacht wird es mit 11 bis 9 Grad empfindlich kühl.³⁴⁷
 in the upcoming night gets it with 11 to 9 degrees sensitively cool
 ‘In the next night, the temperatures will decrease to a level of 11 or 9 degrees’
- (421) Diese Wahl wird ein echter Test für die große Koalition.³⁴⁸
 this election becomes a true test for the big coalition
 ‘This election turns into a true test for a big coalition.’
- (422) So wird aus dem Einbrecher plötzlich ein Bigamist.³⁴⁹
 so gets out the burglar suddenly a bigamist
 ‘Suddenly, the burglar turns into a bigamist.’
- (423) Strohwein ist eine edelsüße Spezialität, die in Deutschland rar
 straw.wine is a noble.sweet speciality that in Germany rare
 geworden ist.³⁵⁰
 become-PPP(ge) is
 ‘Straw wine is a sweet speciality which became rare in Germany.’

³⁴⁷DeReKo: RHZ04/JUL.26792 Rhein-Zeitung, 29.07. 2004.

³⁴⁸DeReKo: NUN06/DEZ.02328 Nürnberger Nachrichten, 20.12. 2006.

³⁴⁹DeReKo: RHZ09/NOV.07144 Rhein-Zeitung, 09.11. 2009.

³⁵⁰DeReKo: RHZ07/AUG.15619 Rhein-Zeitung, 17.08. 2007.

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- (424) Spanien ist zum Paradies der Schönheitschirurgie in Europa
Spain is to.the paradise the-GEN aesthetic.surgery in Europe
geworden.³⁵¹
become-PPP(ge)
'Spain became a paradise of aesthetic surgery in Europe.'

Embedded by the perfect auxiliary *sein*, the copula *werden* is realised as the *ge*-participle *geworden*, as it is illustrated in (423) and (424).

Passive auxiliary

According to Müller (2002, 147; 2007, 306), the passive auxiliary *werden* is most efficiently analysed as a verb that takes a past participle as its infinitive complement. The crucial property of past participles is that their designate subject argument is not part of their subcategorisation frame anymore. Accordingly, the most prominent argument of the past participle is their object argument. The object argument is in turn selected by the passive auxiliary *werden* and becomes its syntactic subject. Roughly speaking, the passive auxiliary involves some sort of object-to-subject raising operation.

In (425), *werden* embeds the transitive verb *betreiben* 'run'. As a matrix verb, it realises its AGENT argument as a subject NP with nominative case and its THEME argument as an object NP with accusative case. As soon as it is selected by the passive auxiliary *werden*, it appears as the past participle form *betrieben* and its designate subject argument will be no longer available in its subcategorisation frame. As a consequence, the THEME argument *Möbelcenter oder Baumärkte* 'furniture centres or building centres' raises to the subject position of the matrix predicate *werden* in which it is realised as a nominative NP.

- (425) Möbelcenter oder Baumärkte werden meist von denselben Konzernen
furniture.centres or building.centres PASS.AUX most by the.same concern
betrieben.³⁵²
run-PPP
'Furniture centres or building centres are usually run by the same concern.'
- (426) Der neue Bereich wird von Marcel Klaus geleitet, der vom
the new area PASS.AUX by Marcel Klaus direct-PPP who from.the
Tamedia-Konzern zur Crossair zurückgekehrt ist.³⁵³
Tamedia-concern to.the Crossair return-PPP is
'The new section is directed by Marcel Klaus who has returned from the Tamedia-Concernt
to the Crossair.'
- (427) Die erste große Universalbank ist 1810 von Rothschild gegründet
the first bog universal.bank PERF.AUX 1810 by Rothschild found-PPP
worden.³⁵⁴
PASS.AUX-PPP

³⁵¹DeReKo: NUZ05/DEZ.02372 Nürnberger Zeitung, 20.12. 2005.

³⁵²DeReKo: R98/JAN.06668 Frankfurter Rundschau, 27.01. 1998.

³⁵³DeReKo: A01/NOV.39871 St. Galler Tagblatt, 02.11. 2001.

‘The first big universal bank has been founded in 1810 by Rothschild.’

- (428) Nach mehr als drei Wochen ist die deutsche Archäologin Susanne Osthoff von
 after more than three weeks is the German archaeologist Susanne Osthoff by
 ihren Entführern frei gelassen worden.³⁵⁵
 her kidnappers free let-PPP(ge) PASS.AUX-PPP(ge)
 ‘After, three weeks the German archaeologist Susanne Osthoff has been released by her
 kidnappers.’

According to most standard grammars of German such as Eisenberg (2004, 124) and Eisenberg et al. (2005, 466), *werden* has an irregular past participle that is reminiscent of the IPP. It is realised as a form without *ge*-prefix that involves an alternation of the stem vowel. The past participle is spelled out as *worden*, as it is indicated in (428).

Surprisingly, a couple of hundreds instances could be found in the archive T of the DeReKo corpus in which the past participle of the passive auxiliary is spelt out as *geworden* which is actually the form that belongs to the copula interpretation of *werden*.³⁵⁶ According to traditional grammars, this option should not exist.

Aside from the patterns described above, *werden* can select verbs which do not involve an accusative object. Lacking a direct object, the result of the passivisation with these verbs is a structure which does not contain a syntactic subject. Traditionally it is called *unpersönliches Passiv* ‘impersonal passive’, as it is discussed by Müller (2002, 118; 2007, 220):

- (429) Dort wird Menschen geholfen, die sich keinen Anwalt
 there PASS.AUX-SG people-DAT.PL help-PPP REL.PRN REFL no advocate
 leisten können.³⁵⁷
 afford-INF can
 ‘At this place, people get aid which cannot afford an advocate.’

Crucially, the sentence lacks a nominative subject NP. The passive auxiliary exhibits default inflection, which is 3. person singular in German. The dative object of the passivised verb *helfen* ‘help’ continues to bear dative case and does not agree with the finite passive auxiliary *wird*.

Future related interpretations

There are instances of *werden* with an infinitive complement in which the embedded predicate refers to an event in the future. It is contested as to which extent these uses can be analysed as future tense auxiliary. On the one hand, there are authors such as Krämer (2005, 26) who show that this future related interpretation of *werden* can be clearly distinguished from its epistemic counterpart. Therefore, she assumes that *werden* has an independent interpretation as a future auxiliary. In contrast, Vater (1975) and Erb (2001, 176) argue that *werden* with an infinitive

³⁵⁴DeReKo: R99/FEB.08474 Frankfurter Rundschau, 02.02. 1999.

³⁵⁵DeReKo: BRZ05/DEZ.11398 Braunschweiger Zeitung, 19.12. 2005.

³⁵⁶Investigation carried out on 22nd July 2012. The regular past participle of the passive auxiliary *worden* could be attested 500.000 in the same archive.

³⁵⁷DeReKo: NUN06/AUG.00493 Nürnberger Nachrichten, 04.08.2006.

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complement always has to be considered as a modal auxiliary, even in its uses with future related interpretations. Vater (1975, 95) notices that *werden* behaves atypically as it can embed complements that refer to the past. As Erb (2001, 146) illustrates *werden* with an infinitive occurs in an environment that is similar to modal verbs rather than to the one in which the perfect tense auxiliary occurs. Whereas Vater (1975, 119) assumes that *werden* can be either interpreted in a circumstantial modal or an epistemic modal manner, Erb (2001, 175) argues that *werden* is always an epistemic modal verb. Likewise, Enç (1996, 351) has demonstrated that English *will* differs essentially from genuine tense auxiliaries with respect to sequence of tense effects and embedding other tense operators.

Furthermore, authors that advocate a modal analysis of the future auxiliaries *werden* and *will* do not agree with respect to the specification of the relevant modal force. Whereas Brennan (1993, 97) and Enç (1996, 356) conclude that the English future auxiliary *will* is a necessity modal operator, Vater (1975, 113) argues that *werden* involves a modal force situated between the one of *können* (possibility) and the one of *müssen* (necessity). Likewise, Zifonun (1997, 1910) classifies *werden* as a modal probability operator. Less explicit, Kratzer (1981, 58) is inclined to treat *werden* as a necessity modal operator, as she associates it with the adverb *certainly*.

Finally, Kissine (2008) argues for English that *will* always has to be considered as a future auxiliary rather than as a modal auxiliary. At this point, it is not clear to which extent such an analysis could be plausibly defended for German.

As it turns out, it is no trivial matter to capture the future oriented uses of *werden*. But it seems to be useful to draw a careful distinction between the future oriented reading and the epistemic one. In contrast to the analysis suggested by Erb (2001, 175), there are instances of *werden* that occur in environments in which genuine epistemic modal verbs cannot occur. If all the instances of *werden* were indeed epistemic, additional explanations would become necessary to explain the acceptability of the examples below (430)–(433).

- (430) Wir werden jetzt 1000 Unternehmen anschreiben und anfragen, ob sie
we will now 1000 enterprises write-INF and ask-INF whether they
sich an dieser tollen Aktion beteiligen.³⁵⁸
REFL at this amazing action participate
'Now, we will write to 1000 enterprises in order to ask whether they want to participate in
this amazing action.'
- (431) In der Goldbäckerei Schulze wird es von 11 bis 12 Uhr und von 12 bis 13
in the Goldbäckerei Schulze will it from 11 until 12 o'clock and from 12 until 13
Uhr wieder eine Kinderbetreuung geben.³⁵⁹
o'clock again a child.care give-INF
'There will be a child care again in the Goldbäckerei Schulze from 11 am to 12 am and
from 12 am to 1 pm.'
- (432) Die Freie Bürgerliste hat allen Grund zum Feiern. Sie wird in Zukunft mit
the Freie Bürgerliste has all reason to.the celebrate she will bin future with

³⁵⁸DeReKo: BRZ06/JUN.06668 Braunschweiger Zeitung, 14.06. 2006.

³⁵⁹DeReKo: BRZ07/DEZ. 19912 Braunschweiger Zeitung, 07.12. 2007.

drei Mandaten im Gemeinderat vertreten sein.³⁶⁰
 three mandates in.the city.council represent-PPP be-INF

‘The Freie Bürgerliste has every reason to celebrate. They will be represented in the city council by three mandates.’

- (433) Er selbst wird dann zwar bereits das 65. Lebensjahr überschritten haben.³⁶¹
 he himself will then PART already the 65th live.age pass-PPP have-INF
 ‘Then, he will already have passed the 65th year of his life.’

First of all, the future oriented use of *werden* fairly often selects subjects that are specified for the 1. person singular or plural (430). This is unexpected for any approach that assumes that *werden* is always an epistemic modal verb: as Heine (1995, 24) has pointed out, the 1. person subjects are very unusual for epistemic modal verbs. Erb (2001, 176) argues that it is the 1. person feature that brings about the future resonance. However, the scope of her explanation is limited and would not apply to any of the other examples given above.

Furthermore, Krämer (2005, 23) points out that *werden* with an infinitive (i) can be embedded in restrictive relative clauses and without any complication, (ii) can bear verum focus and finally (iii) it can be embedded by predicates of desire such as *hoffen*. Crucially, in all these environments it is restricted to future interpretation.

In none of the examples illustrated above, an epistemic interpretation is plausible. Assuming that epistemic *werden* involves a (weak) necessity operator, it should be possible to substitute it by another epistemic necessity operator such as *müssen*. However, any replacement would drastically decrease the speaker’s commitment to the validity of the proposition. This indicates that there are at least two interpretations of *werden* with respect to the degree of the speaker’s commitment. Likewise, Krämer (2005, 60) argues that epistemic *werden* is specified for [-EVIDENCE]. This indicates that the commitment to the embedded proposition is not based on direct evidence. Such a restriction does not apply to the future interpretations listed above.

As it turns out, *werden* exhibits a whole range of striking analogies with respect to circumstantial modal verbs: it selects a bare infinitive complement, it tolerates non-referential subjects (431) and it locates the embedded predication in a time interval after utterance time. However, there are some crucial differences. First of all, Erb (2001, 146) illustrates that the future reading of *werden* is neither attested as an infinitive nor as a past participle. This does not apply to circumstantial modal verbs in German. Moreover, English *will* can be used as a quantificational necessity modal verb as it has been pointed out by Brennan (1993, 97) and Enç (1996, 356). This does not seem to be the case to the same extent for its German counterpart *werden*. Once again, this illustrates that there are differences between the future reading of *werden* and the six traditional modal verbs.

All these circumstances listed here indicate that under a narrow perspective *werden* can be neither neatly subsumed to the six traditional circumstantial modal verbs nor to the epistemic modal verbs.

³⁶⁰DeReKo: BVZ07/OKT.01215 Burgenländische Volkszeitung, 10.10. 2007.

³⁶¹DeReKo: HAZ08/NOV.03088 Hannoversche Allgemeine, 18.11. 2008.

Raising infinitives with clause modification

As Bauer (1870, 157 §164 Fn.), Welke (1965, 12), Vater (1975, 110), Fritz (1991, 43), Engel (1996, 463) Erb (2001, 161) and Krämer (2005, 57) have pointed out, *werden* with an infinitive complement can be interpreted in an epistemic manner analogous to the epistemic interpretation of the traditional modal verbs. As Krämer (2005, 128) demonstrates, the epistemic pattern has emerged out of the future interpretation. According to Fritz (1991, 43), this development must have occurred prior to the early 17th century, the period when the first instances of epistemic *werden* are attested.

Just as the traditional modal verbs do, *werden* is restricted to an epistemic interpretation whenever it embeds a predication between an identified individual and a predicate that refers to a state that cannot be changed or a predicate that refers to some past event (436) and (438).

- (434) Der Leser wird wohl den wackeren Komponisten Gluck kennen,
the reader will probably the brave composer Gluck know-INF,
vornamens Christoph Willibald, einen Oberpfälzer.³⁶²
with.first.name Christoph Willibald a upper.Palatinate
'The reader will probably know the composer Gluck whose first name is Christoph Willibald,
from Upper Palatinate.'
- (435) „Vermutlich wird der 16-Jährige der Täter sein“, sagt Polizeisprecher
presumably will the 16.year.old the culprit be-INF says police.spokesman
Thomas Buchheit, der aber nicht ausschließen will, dass der junge Mann in
Thomas Buchheit who yet NEG exclude wants that the young man in
Notwehr gehandelt haben könnte.³⁶³
self-defence act-PPP have-INF could
' „Presumably, the 16 year old will be the culprit“ says the police spokesman Thomas
Buchheit who does not want to exclude that the young man has acted in self-defence.'
- (436) Es wird schon einen Grund gehabt haben, warum die Eisbärin ihre
it will already a reason have-PPP have why the ice.bear.lady her
Jungen gefressen hat.³⁶⁴
offspring eaten has
'There will be a reason why the female polar bear lady has eaten her offspring.'
- (437) So knapp 1000 Zuschauer werden es wohl gewesen sein, die trotzdem
so barely 1000 spectators will it wohl be-PPP be-INF that nevertheless
kamen.³⁶⁵
came
'There will have been barely 1000 spectators that came nevertheless.'

³⁶²DeReKo: O98/AUG.75935 Neue Kronen-Zeitung, 04.08. 1998.

³⁶³DeReKo: HAZ08/MAI.03238 Hannoversche Allgemeine, 19.05. 2008.

³⁶⁴DeReKo:NUN08/JAN.00722 Nürnberger Nachrichten, 08.01. 2008.

³⁶⁵DeReKo: NUN07/APR.00752 Nürnberger Nachrichten, 10.04. 2007.

- (438) In meinem zwölften Lebensjahr wird es gewesen sein, als am Frühmorgen
 in my twelfth live.year will it be-PPP be-INF as at.the early.morning
 des heiligen Christ abends mein Vater mich an der Schulter rüttelte³⁶⁶
 the-GEN holy-GEN christ evening-GEN my father me on the shoulder shook
 ‘It must have been in when I was twelve that my father shook me on my shoulder.’

Furthermore, in all of the instances above the embedded proposition is not part of the speaker’s knowledge. In a similar manner, Comrie (1989, 60), Fabricius-Hansen (2000, 183+6), Erb (2001, 161) and Krämer (2005, 60, 133) argue that speaker does not have the requested direct evidence to assert the embedded proposition.

It is remarkable that most of the instances found in the DeReKo corpus belong to interviews, direct speech and other instantiations of spoken language. Furthermore, epistemic *werden* is frequently used to estimations of numbers, as it is exemplified in (437).

There are further parallels between *werden* and the traditional modal verbs: as Erb (2001, 146) illustrates, epistemic *werden* is hardly attested as an infinitive nor as a past participle. In opposition, Krämer (2005, 34) demonstrates that epistemic *werden* is excluded from a couple of environments in which epistemic *müssen* and *können* can occur such as in the scope of a negation, in questions and under verum focus. This leads Krämer (2005, 49) to the conclusion that *werden* is an extra-propositional evidential operator in opposition to epistemic modal verbs. As this matter is far from trivial, it will be postponed to Section 6.

As it has been addressed above, it is far from obvious which modal force the epistemic use of *werden* could involve. Whereas Brennan (1993, 97) and Enç (1996, 356) analyse its English counterpart *will* as a necessity modal, the situation in German is less obvious. Kratzer (1981, 58) appears to be inclined to analyse *werden* as a necessity modal operator associating it with the adverb *certainly*. Zifonun (1997, 1910) concludes that epistemic *werden* acts as a modal probability operator. In a similar vein, Fritz (1997, 94) concludes that epistemic *werden* expresses a stronger modal force than *epistemic* but a weaker modal force than epistemic *müssen*. Finally, Vater (1975, 113) localises the modal force of *werden* somewhere between *können* and *müssen*.

If epistemic *werden* was indeed a canonical necessity modal operator such as *müssen*, it should be possible to substitute it by *müssen* without affecting the overall interpretation. However, such a replacement would change the meaning of the pattern (436). Moreover, it is fairly doubtful that the semantic difference between epistemic *müssen* and epistemic *werden* is only a matter of modal force.

In order to account for the different interpretations of epistemic *must* and epistemic *will* in English, Sweetser (1990, 55) and Ziegeler (2006, 88) conclude that the specific contribution of epistemic *will* concerns the verification of the embedded proposition. Whereas the future interpretation of *will* expresses that the speaker expects a certain event to occur in the future, the epistemic reading indicates that the speaker expects that the speculative embedded proposition can be verified in the future. As Sweetser (1990, 55) concludes, the use of epistemic *will* is based on the assumption “if we check we will find out”. Fabricius-Hansen (1999, 124) and Krämer (2005, 133) suggest an analogous analysis for German *werden*.

Though very plausible, their approach faces shortcomings. There are uses of epistemic *wer-*

³⁶⁶DeReKo: K00/DEZ.81948 Kleine Zeitung, 24.12. 2000.

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den in which the speaker definitely knows that he will never be in the position to verify the speculative embedded proposition:

- (439) Sie werden es also gewusst haben: Diesmal würden sie nicht mehr
they will it thus know-PPP have-INF this.time would they NEG more
wegkommen.³⁶⁷
away.get-INF
'They will/must have known that they would not be to late to escape this time.'

The example (439) is taken from a discourse that deals with the suicide of the national socialist terrorists Uwe Bönhardt and Uwe Mundlos. In their final moment, their bus was surrounded by the police, there was no way of escaping. Under unknown circumstances the two terrorists shot themselves. Using the epistemic instance of *werden*, the author of that article attributes a thought to the two men which they could have had in mind leading up to their suicide. It is fairly doubtful if the author really is convinced that he will find out the last thoughts of these terrorists.

As it turns out, the suggestion developed by Sweetser (1990, 55) is not entirely appropriate and requires slight modifications.

4.2.11 *scheinen* and *dünken*

While *werden* and *brauchen* exhibit patterns that are entirely parallel to the epistemic readings of modals, the raising verb *scheinen* 'shine, seem, appear' evidently differs in a couple of respects. First of all, it is restricted to *zu*-infinitive complements. In opposition to *brauchen*, no instances with a bare infinitive complement have been observed so far. Moreover, it always exhibits some sort of epistemic or evidential interpretation, except from its unergative use. Finally, *scheinen* optionally realises the epistemic attitude holder as dative NP.

There is a lively debate going on to which extent *scheinen* with *zu*-infinitive can be subsumed to the same syntactic and semantic class as epistemic modal verbs. On the one hand, there are authors such as Askedal (1998, 61) and Wurmbrand (2001, 205) that argue that *scheinen* is an epistemic verb just like the traditional epistemic modal verbs. On the other hand, Pafel (1989, 143) *scheinen* behaves differently in a couple of essential points: it can optionally realise the epistemic attitude holder as its indirect object NP.

As it has been noticed by Ebert (1976, 41–45) and Diewald (2001, 101), *scheinen* is similar to *dünken* 'seem, to cause to think' in much respect which used to be the causative counterpart of *denken* 'think'. However, the latter one has almost disappeared over the course of the last centuries. As *dünken* behaves slightly differently, it will be useful to determine the nature of *scheinen*.

The verb *scheinen* occurs in five different syntactic patterns: (i) as an unergative intransitive verb, (ii) as a copula, (iii) as an impersonal verb with a finite *dass*-clause complement, (iv) as an impersonal verb that selects a hypothetical comparative *als ob* clause and (v) as a raising verb that selects a *zu*-infinitive complement. Similar classifications have been undertaken by Pafel (1989, 124), Askedal (1998, 70), Diewald (2001, 94) and Pinto de Lima (2004). In opposition, *dünken* can only be found in the configurations (ii)–(v) depending on the respective historical

³⁶⁷Der Spiegel, 47/2011 21.11., p.22.

period. In Contemporary Standard German, *diinken* has almost vanished, occasionally it is still used as a copula.

Unergative uses

As it has been illustrated by Diewald (2001, 95) and Pinto de Lima (2004), *scheinen* can still be used as an intransitive main verb with a clear lexical meaning. In this use, it determines its subject referent as a source that emits light, as it is exemplified in (440)–(441).

- (440) Der fast runde Mond scheint am Himmel.³⁶⁸
 the almost round moon shines at.the sky
 ‘The almost round moon is shining in the sky.’
- (441) Wie gut ist es, wenn in der Dunkelheit Lichter scheinen und das Dunkle hell machen.³⁶⁹
 make
 ‘How good it is when there are lights shining in the darkness and they make the dark become bright.’

Occasionally, unergative *scheinen* is complemented by a directional phrase that describes the path the ray of light follows.

Predicative phrases

As it has been illustrated by Askedal (1998, 52f.) and Diewald (2001, 95) and Pinto de Lima (2004) *scheinen* can be used as a copula that selects various types of predicative phrases: adjectives (442), noun phrases (443) and prepositional phrases. In its copula pattern, *scheinen* is similar to English *seem* in that it expresses that somebody has the evidence to conclude that the embedded predication is valid.

In opposition to other copulas such as *sein*, *werden* or *bleiben* ‘stay’, *scheinen* optionally realises a dative argument that refers to the epistemic attitude holder who is exposed to the unspecified type of evidence. As Askedal (1998, 52f.) points out, *scheinen* is attested with all types of predicative phrases with and without a dative object.

The corpus study presented here has revealed three interesting tendencies. First of all, the copula *scheinen* does not occur very frequently with genuine predicative NPs such as in (443). Furthermore, the dative object of *scheinen* is not very often realised. Finally, if it is realised, it is almost always represented by a 1. person pronoun (*mir* or *uns*). Examples with other types of dative NPs are fairly rare but they are nevertheless attested (443):

- (442) Doch ihr Ehrgeiz scheint ungebrochen.³⁷⁰
 yet her ambition seems unbowed.
 ‘Yet, her ambition seems unbowed.’

³⁶⁸DeReKo: A09/NOV.00303 St. Galler Tagblatt, 02.11. 2009.

³⁶⁹DeReKo: M11/DEZ.03530 Mannheimer Morgen, 10.12. 2011.

³⁷⁰DeReKo: M06/JAN.01737 Mannheimer Morgen, 09.01. 2006.

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- (443) Gewaltloser Widerstand scheint ihm das einzig probate Mittel.³⁷¹
non-violent resistance appears him-DAT the only appropriate means
'Non-violent resistance appears to be the only appropriate means to him.'

The verb *dünken* behaves like its cognate *scheinen* in most respect. It can be combined with predicative adjectives and predicative nouns. Its object is almost always specified for the 1. person. However, it differs in two points. Firstly, *dünken* realises its epistemic attitude holder as an accusative NP rather than as a dative NP. Secondly, this accusative NP appears to be obligatory and is present in most of the instances found in the DEREKO corpus.

- (444) Der Weg nach Tobel dünkt ihn unendlich weit.³⁷²
the way to Tobel thin-CAUS him-ACC eternally long
'The way to Tobel seems eternally long.'
- (445) Eine Ewigkeit dünkt mich das Warten.³⁷³
a eternity think-CAUS me-ACC the waiting
'The waiting seems an eternity to him.'

As *dünken* is an archaic pattern, it becomes less and less frequent. Most contemporary native speakers contaminate the fairly particular pattern of *dünken* with semantically related patterns of verbs that occur more frequently, such as *scheinen*. Accordingly, the accusative NP alternates with a dative NP, as it will be exemplified in the upcoming sections. Moreover, instances can be found in which *dünken* has a regular preterite form.

dass-clauses

Pafel (1989, 124), Askedal (1998, 52) and Diewald (2001, 98) have illustrated in much detail that *scheinen* can be used as an impersonal verb that subcategorises a finite *dass*-clause. The interpretation is analogous to the copula pattern of *scheinen*. As Askedal (1998, 52) has observed, the realisation of the dative object is optional. Once again, this dative object is mostly instantiated as 1. person pronoun. In some rare cases, also other types of NPs can be found in this context, as it is exemplified in (446).

As regards *dünken*, it behaves nearly analogous to *scheinen* except for the fact that it has an obligatory object. As the example (449) indicates, some speakers tend to use a dative NP rather than an accusative one, possibly due to contamination with the *scheinen*-pattern.

- (446) Ihm scheint, dass die Zeit der touristischen Erschliessungen der
him-DAT seems that the time the-GEN tourist development the-GEN
Alpen mit grosstechnischen Anlagen vorbei ist.³⁷⁴
alps-GEN with big.technical sites over is
'It seems to him that the time of tourist development in the alps with colossal technical sites is over.'

³⁷¹DeReKo: HAZ08/NOV.04416 Hannoversche Allgemeine, 25.11. 2008.

³⁷²DeReKo: A98/FEB.12719 St. Galler Tagblatt, 28.02. 1998.

³⁷³DeReKo: O95/MAI.44351 Neue Kronen-Zeitung, 05.05. 1995.

³⁷⁴DeReKo: A01/DEZ.48633 St. Galler Tagblatt, 03.12. 2001.

- (447) Es scheint, dass er sich an das Leben in freier Natur gewöhnt hat.³⁷⁵
 it seems that he REFL on the live in free nature accustomed has
 ‘It seems that it has become accustomed to the life in the great outdoors.’
- (448) Aber mich dünkt, dass der Weg dorthin immer länger wird.³⁷⁶
 but me-ACC think-CAUS that the way there always long becomes
 ‘Yet, it appears to me that it the way there becomes longer and longer.’
- (449) Mir dünkt, dass Bauvorhaben der öffentlichen Hand mit
 me-DAT thinks-CAUS that building.projects the-GEN public-GEN hand-GEN with
 Absicht so niedrig wie möglich kalkuliert werden, damit sie beim
 intention as low as possible calculate-PPP AUX.PASS so.that they at.the
 Steuerzahler als günstig erscheinen.³⁷⁷
 tax.payer as cheap appear
 ‘It seems to me that building projects of the public authorities are intentionally calculated
 to be as cheap as possible in order to make them look like a bargain to the tax payer.’

As Askedal (1998, 52) has pointed out, the complement clause can be alternatively realised as a clause that exhibits a verb second word order and that does not involve any subordinating conjunction. As this alternation does not affect only *scheinen* with finite *dass*-clause but a very extensive class of verbs, it will not receive any further attention here.

As Diewald (2001, 104) stresses, *scheinen* with finite *dass*-clause is only attested from the 18th century, whereas the pattern with *zu*-infinitive complements has already emerged in the 16th century, as it has already been illustrated by Ebert (1976, 41). Accordingly, the pattern with *zu*-infinitive cannot be derived from *dass*-clause, as it is sometimes suggested, for instance by Chomsky (1981, 43). Moreover, Ebert (1976, 41) has demonstrated that *dünken* with *daz*-clause is already attested in the Middle High German *pârzival*.

Hypothetical comparative *als ob*-clauses

Askedal (1998, 53) stresses that *scheinen* is moreover attested with finite *als ob* clauses and *als*-clauses. These types of subordinate clauses strikingly resemble hypothetical comparative clauses, as they are characterised in Jäger (2010, 469). In a similar manner, *dünken* can be combined with hypothetical comparative clauses as well.

As far as the argument structure is concerned, both verbs behave in the same way as they do with *dass*-clause complements: in the case of *scheinen* the realisation of the dative NP is optional (450)–(451), in the case of *dünken* the realisation of the argument is obligatory, once again, accusative and dative alternate (452)–(453).

- (450) es scheint mir, als ob du heute nicht irren könntest.³⁷⁸
 it seems me-DAT as if you today NEG err could
 ‘It seems to me as if you could not err today.’

³⁷⁵DeReKo: A08/APR.03463 St. Galler Tagblatt, 09.04. 2008.

³⁷⁶DeReKo: A11/JUL.02254 St. Galler Tagblatt, 07.07. 2011.

³⁷⁷DeReKo: RHZ11/JUL.06178 Rhein-Zeitung, 06.07. 2011.

³⁷⁸DeReKo: GOE/AGM.07859 Goethe: Wilhelm Meisters Wanderjahre, [Roman], (Erstv. 1821).

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- (451) Es scheint nur so, als ob Wolfgang Schäuble nun gerade deswegen neue
it seems only so as if Wolfgang Schäuble now just therefore new
Gesprächsbereitschaft signalisiert: Öffentlich, über die Medien, wandte er
talk.readiness signals in public through the media addressed he
sich schon vor der von den Währungshütern verabreichten Ohrfeige an die
REFL already before the by the currency.watchdog administered slap to the
Sozialdemokraten.³⁷⁹
Social democrats
'It only seems as if Wolfgang Schäuble signals new readiness to negotiate for that reason.
Yet, by media he had already addressed to the Social Democrats before they had got their
slap by the currency watchdog.'
- (452) Eine Nacht hatte er auf der Harzburg einen schweren Traum; es deuchte
a night had he at the Harzburg a heavy dream it think-PST.CAUS
ihm, als ob er mit einem furchtbaren Eber kämpfe, der ihn nach
him-DAT as if he with a terrible boar fight-SBJV.PRS that him after
langem Streit zuletzt besiegte.³⁸⁰
long fight finally overwhelmed
'One night at the Harzburg, he had an oppressive dream. It seemed to him as if he were
fighting with a terrible boar that overwhelmed him after a long battle.'
- (453) Es dünkt mich, als ob alle ein Lächeln auf den Lippen hätten.³⁸¹
it thinks-CAUS me-ACC as if all a smile on the lips had
'It seems to me as if everybody had a smile on his lips.'

As the instance in (452) indicates, the tendency to replace the accusative NP by a dative NP is no recent development. It is already attested in the collection of tales edited by the Grimm Brothers in the early 19th century.

The example (451) reveals the true nature of the verb. The speaker clearly distinguishes between the mere appearance of a state of affairs and its factual being. He is totally aware that the readiness to negotiate that Schäuble signals is not new. He just wants to stress that it only looks like as if it were new. Using *scheinen*, it is possible to the speaker to refer to the mere appearance of a state of affairs even if he knows that it is false. A similar example has been provided by Colomo (2011, 225). Canonical epistemic modal verbs cannot be used in such a manner unless they are in the scope of a counter-factual operator, as it has been shown in Section 4.2.6, 4.2.1 and 4.2.2. But in such a configuration it remains to be checked what is the influence of the counter-factual operator.

Finally, *scheinen* in (451) appears to bear verum focus. If the sentence was uttered, it is very likely that the verb *scheint* would bear a focus stress. The alternatives at discussion are {appearance, factual being}. In the particular example given above, the focus particle *nur* would clearly refer to *scheint* and block all the remaining alternatives. Interestingly, the effect is reminiscent

³⁷⁹DeReKo: NUN97/AUG.01105 Nürnberger Nachrichten, 14.08. 1997.

³⁸⁰DeReKo: GRI/SAG.00311 Des Hackelnberg Traum, (Erstv. 1816 ; 1818), In: Deutsche Sagen, gesammelt von Jacob und Wilhelm Grimm. – o.O., 1891.

³⁸¹DeReKo: SOZ11/DEZ.05459 Die Südostschweiz, 27.12. 2011.

of verum focus, as it has been discussed by Höhle (1992). A similar effect can be observed with some epistemic modal verbs, as it is illustrated in Section 6.9 and 6.10.

These facts reveal the true nature of these verbs. They compare two state of affairs. In the context of example (451), the speaker faces a state of affairs which exhibits on the characteristics as in the hypothetical state of affairs in which Wolfgang Schäuble signals readiness to negotiate. The first state of affairs is syntactically represented by the subject *es* and the second state of affairs is realised as the hypothetical comparative *als ob*-clause. As a consequence, the semantic contribution of *scheinen* is to introduce a hypothetical state of affairs to which the actual situation is compared. This also reflects the nature of its original use as a copula, in which two properties are associated to each other.

Raising infinitives with clause modification

Finally, Ebert (1976, 41), Pafel (1989, 124), Askedal (1998, 52) and Diewald (2001, 97) have demonstrated that *scheinen* selects a *zu*-infinitive complement. There is a widespread consensus that *scheinen* does not select a referential subject and that it has to be a raising verb thus.

Once again, the realisation of the dative object is optional in the case of *scheinen*, as it is illustrated in (454)–(457). However, as Askedal (1998, 56) has found out the dative argument occurs far less frequent whenever *scheinen* selects a *zu*-infinitive complement: only in 5.22 % of the cases of his corpus. In contrast, *scheinen* with finite clausal complements realises the dative NP in 38,52 % of the cases and *scheinen* with a predicative complement in even 56,05 % of the cases. Nevertheless, it is attested in the DeReKO corpus (455)–(457). Another example is provided by Askedal (1998, 52).

In opposition to *scheinen*, the use of *dünken* with *zu*-infinitive complement has almost disappeared from contemporary language, as it has been shown by Maché and Abraham (2011, 266). In earlier stages, it was more frequent in this configuration and it even exhibited a IPP morphology in the 16th century (459).

- (454) Jospin scheint das Opfer seines eigenen Erfolgs geworden zu sein.³⁸²
 Jospin seems the victim his-GEN own-GEN success-GEN become-PPP to be-INF
 ‘Jospin seems to have become the victim of his own success.’
- (455) Eher das Gegenteil scheint mir der Fall zu sein.³⁸³
 rather the opposite seems me-DAT the case to be-INF
 ‘It seems to me that rather the opposite is the case.’
- (456) Jede der Figuren scheint mir in ihren Kokon eingesponnen zu sein.³⁸⁴
 each the-GEN character-GEN seem me-DAT in her cocoon form-INF to be-INF
 ‘It seem to me that each character is caught in his own cocoon.’

³⁸²DeReKo: E00/MAR.07351 Zürcher Tagesanzeiger, 17.03. 2000.

³⁸³DeReKo: SOZ10/MAI.04445 Die Südostschweiz, 25.05. 2010.

³⁸⁴DeReKo: BRZ07/JAN.19721 Braunschweiger Zeitung, 25.01. 2007.

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- (457) Deren Gesichter schienen ihm wie in einem rot gepunkteten Nebel zu
 their faces seem him-DAT like in a red dotted mist to
 verschwimmen.³⁸⁵
 blur-INF
 ‘It seemed to him as if their faces blurred in a red dotted mist.’
- (458) Lohnverzicht und Abkehr vom 30-Stunden-Modell, das dünkt
 wage.sacrifice and renunciation from.the 30.hours.model that think-SBJV.PST
 sie denn doch reines Teufelswerk zu sein.³⁸⁶
 them-ACC then PART pure devil.work to be-INF
 ‘It seems to them that the sacrifice of their wage and the renunciation from the 30 hours
 model is the pure work of the devil.’
- (459) Vnd sagte jm / wie er die Portugaleser hette lernen kennen
 and said him how he the Portuguese have-SBJV.PST learn-PPP(ipp) know-INF
 / vnd er were allwegen jr Freund gewesen / denn sie hetten
 and he be-SBJV.PST always their friend be-PPP since they have-SBJV.PST
 jn rechtschaffene Leut duencken seyn /³⁸⁷
 him-ACC righteous people think-CAUS.PPP(ipp) be-INF
 ‘And he said to him how he made acquaintance with the Portuguese and that he always was
 their friend as they seemed to him righteous people.’

As the examples (460) and (461) illustrate, *scheinen* allows for the selection of infinitives with non-referential subject NPs. This indicates that it has indeed to be analysed as a raising verb.

- (460) Unter den Bier-Fans scheint es wesentlich mehr Kampfrinker zu geben als
 among the beer-fans seem it considerably more binge.drinker to give-INF than
 unter den Wein-Freunden.³⁸⁸
 among the wine-friends
 ‘Among the fans of beer, there seem to be considerably more binge drinkers than among the
 friends of wine.’
- (461) In Deutschland scheint es elf Monate im Jahr zu regnen.³⁸⁹
 in Germany seem it eleven months in.the year to rain-INF
 ‘In Germany, it seems to rain eleven months a year.’

As it has already been mentioned above, there are authors that group *scheinen* with *zu*-infinitive together with the traditional epistemic modal verbs into a single syntactic and semantic class. Askedal (1998, 60) illustrates that *scheinen* involves (i) a raising pattern, (ii) it selects an obligatorily coherent infinitive complement/it triggers clause union, (iii) it lacks an imperative, (iv) it lacks an infinitive, (v) it lacks a past participle and (vi) it cannot select VP-anaphora, as it

³⁸⁵DeReKo: BRZ06/MAR.07145 Braunschweiger Zeitung, 13.03. 2006.

³⁸⁶DeReKo: NUN95/NOV.00207 Nürnberger Nachrichten, 03.11. 1995.

³⁸⁷Ulrich Schmid *Neuwe Welt*, p. 20b, (1567).

³⁸⁸DeReKo: RHZ96/AUG.07223 Rhein-Zeitung, 14.08. 1996.

³⁸⁹DeReKo: NUZ06/JUN.00564 Nürnberger Zeitung, 06.06. 2006.

has also been illustrated by Neugeborn (1976). These circumstances lead Askedal (1998, 61) to the conclusion that *scheinen* with a *zu* infinitive complement belongs to the class of future and epistemic auxiliaries, together with the traditional epistemic modal verbs, *werden*, *drohen*, *versprechen* and *pflügen*. For similar reason, Wurmbrand (2001, 205) argues that *scheinen* belongs to the class of epistemic (modal) verbs. In any case, it cannot be denied that there are analogies, it is just a matter of how essential they are.

However, there are a couple of respects in which *scheinen* behaves fairly differently from the traditional epistemic modal verbs. Firstly, (i) *scheinen* grammatically realises the epistemic attitude holder, as it has been pointed out by Pafel (1989, 125). Apart from that, (ii) it behaves in a peculiar manner when it bears past morphology. In such a context, it refers to past evidence. Nevertheless, the Time of Evaluation can be identical to the Time of Utterance, as it will be illustrated in more detail in Section 7.2. In these environments, it cannot be replaced by an epistemic modal with past morphology. Moreover, (iii) *scheinen* introduces an infinitive particle *zu* that cannot be dropped under any circumstance. Furthermore, (iv) the speaker can know that the embedded proposition is in fact false, as it has been demonstrated by Colomo (2011, 225). This is a fairly unlikely scenario with epistemic modal verbs and obviously only possible if they are in the scope of a counter-factual operator, as it has been demonstrated in the Sections 4.2.1, 4.2.2 and 4.2.6. Finally, (v) *scheinen* does not involve any interpretation that could be considered as a circumstantial modality, or future oriented reading as it is possible with *werden*.

All these circumstances indicate, that *scheinen* is a predicate that behaves in a similar manner with respect to epistemic modal verbs. Yet, it turns out that it is substantially different from epistemic modal verbs and it occurs in many contexts where epistemic modal verbs are totally excluded. Apart from that, any analysis which considers *scheinen* as an epistemic modal verb neglects the fact that also embeds hypothetical comparative clauses. Accordingly, *scheinen* is as a verb that compares two state of affairs. Even if it is less explicit, this analysis also applies to *scheinen* with an infinitive complement. In (454), there is a state of affairs in the real world which exhibits the same essential characteristics as the hypothetical state of affairs in which Jospin is the victim of his own success.

4.2.12 *drohen*, *versprechen* and *verheißen*

As it has been illustrated by Bech (1955, 126f.), Kiss (1995, 154), Askedal (1997b), Reis (2001, 312 Fn. 40; 2005b; 2007), Wurmbrand (2001, 205), Pinto de Lima (2005) and Colomo (2011), *drohen* ‘threaten’ and *versprechen* ‘promise’ can be used as raising verbs that appear to be related to epistemic modal verbs. Moreover, Łukasz Jędrzejowski (pers. commun.) has suggested that *verheißen* ‘augur, promise’ is another promising candidate that could occur in this pattern as well. And indeed, it is attested in a very similar distribution as *versprechen*.

This phenomenon is not restricted to German but it can be found in several European languages such as English *promise* and *threaten* (cf. Traugott (1997)), Portuguese *ameaçar* ‘threaten’ (cf. Pinto de Lima (2005)) and Spanish *prometer* ‘promise’ and *amenazar* (cf. Cornillie (2007, 85)).

Once again, there are accounts in which *drohen* and *versprechen* are explicitly analysed as epistemic modal verbs such as Askedal (1997b, 14), Wurmbrand (2001). In contrast to that, there are also approaches in which the opposite is assumed. Reis (2001, 312 Fn. 40; 2005b,

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129; 2007, 13) and Colomo (2011) argue that *drohen* and *versprechen* differ from epistemic modal verbs in essential aspects. Accordingly, they should not be treated as epistemic modal verbs. As it will turn out in the empirical investigations sketched below, the latter approach has more explanatory potential.

As it will be shown, all these verbs occur in various syntactic pattern. However, they do not behave in a uniform manner. First of all, *drohen* is employed (i) as a two place intransitive verb that a dative NP and a *mit* ‘with’ -PP. (ii) The referent expressed by the *mit*-PP can be realised as a finite *dass*-clause. And finally, (iii) *drohen* occurs with *zu* infinitive complements. In this configuration, it can either involve a (iii) control pattern or a (iv) raising pattern. In contrast, *versprechen* and *verheißen* occur as (i) ditransitive verbs with an accusative NP and a dative NP, (ii) with finite *dass*-clause complements and finally with control *zu*-infinitive complements and raising *zu*-infinitive complements.

Transitive and intransitive uses

All of the three verbs are attested as three-place predicates that select an AGENT argument, a RECIPIENT argument and a THEME (?INSTRUMENT) argument. In any case, the AGENT argument is realised as a nominative NP and the recipient argument as a dative NP. The remaining argument is represented as a *mit*-PP rather than as an accusative NP in the case of *drohen*. In (462), this argument surfaces as the PP *mit Krieg* ‘with war’. Accordingly, this particular use of *drohen* cannot be considered as transitive use. In contrast, the third argument is realised as an accusative NP in the case of *versprechen* and *verheißen*. In the examples below, *versprechen* realises its THEME argument as the accusative NP *anstrengungslosen Wohlstand* ‘effortless wealth’ (463) and *verheißen* as the accusative NP *kein grosses Outperformance-Potential* (464).

Likewise, Colomo (2011, 221) observes that *drohen* and *versprechen* differ with respect to the argument structure they involve.

- (462) Kabila drohte unterdessen dem Nachbarland Ruanda mit Krieg,
Kabila threatened meanwhile the neighbour.country ruanda with war
weil es an der Seite der Rebellen in den Kongo einmarschierte.³⁹⁰
because it at the side the-GEN rebels-GEN in the Kongo invade-SBJV.PRS
‘Kabila threatened his neighbour country ruanda with war as it supposedly invades the
Kongo together with the rebels.’
- (463) Wer dem Volk anstrengungslosen Wohlstand verspricht, lädt zu
whoever the people effortless wealth promises invites to
spätromischer Dekadenz ein.³⁹¹
Late.Roman decadence in
‘Those who promise effortless wealth to the people will yield Late Roman decadence.’
- (464) Der CSFB-Analyst verheißt der Schweizer Börse deshalb „kein
the CSFB-analyst augurs the Swiss Stock.Exchange therefore no

³⁹⁰DeReKo: NUN98/AUG.00548 Nürnberger Nachrichten, 07.08. 1998.

³⁹¹DeReKo: BRZ10/FEB.08056 Braunschweiger Zeitung, 16.02. 2010.

grosses Outperformance-Potential”.³⁹²

big out.performance.potential

‘The CSFB-analyst predicts no big out-performance-potential for the Swiss Stock Exchange.’

As it turns out, the dative NP is not realised in most of the instances found in the corpus. In this respect, the examples (462)–(464) illustrated above are rather atypical.

dass-clauses

Apart from this, *drohen*, *versprechen* and *verheißen* occur as three-place predicates which realise their THEME argument as a finite *dass*-clause. This merits closer attention as the three verbs differ in other environments with respect to the realisation of the THEME argument. However, whenever the THEME argument surfaces as a clausal argument these differences disappear.

As the instances (466) and (467) indicate, the RECIPIENT argument can once again be represented as a dative NP.

- (465) Er droht aber auch, dass er Ali Sagdas das Geschlechtsteil abschneiden und es
he threatens but also that he Ali Sagdas the sex cut.off and it
ihm in den Mund legen werde.³⁹³
him in the mouth put-PASS.AUX will-SBJV.PRS

‘But he also threatens Ali Sagats to cut off his sex and to put it into his mouth.’

- (466) Generell versprechen Union und FDP den Firmen, dass es in Zukunft
generally promise Union and FDP the enterprises that it in future
unbürokratischer zugeht.³⁹⁴
non.bureaucratic goes

‘Generally, the Union and the FDP promise to the enterprises that the procedure will be less bureaucratic in future.’

- (467) Seinem ehemaligen Salzburger Assistenten Philippe Auguin verheißt er, daß er
his former Salzburger assistant Philippe Auguin promises he that he
in Nürnberg „ganz sicher ein ‚Meisterdirigent‘ wird!“³⁹⁵
in Nürnberg very certainly a master.conductor becomes

‘He promises to his former assistant in Salzburg Philippe Auguin that he will become a master conductor in Nürnberg.’

Once again, the dative argument does only occur fairly rarely irrespective of the matrix predicate. In most of the instances that can be found in the corpus, the RECIPIENT is not overtly realised.

³⁹²DeReKo: E98/MAR.07874 Zürcher Tagesanzeiger, 21.03. 1998.

³⁹³DeReKo: NON09/DEZ.14663 Niederösterreichische Nachrichten, 28.12. 2009.

³⁹⁴DeReKo: RHZ09/OKT.14552 Rhein-Zeitung, 17.10. 2009.

³⁹⁵DeReKo: NUN98/FEB.00803 Nürnberger Nachrichten, 10.02. 1998.

Control infinitives with event modification

Alternatively, *drohen*, *versprechen* and *verheißen* are attested as three-place predicates that realise their THEME arguments as *zu*-infinitive complements. As Reis (2005b, 126; 2007, 8) and Colomo (2011, 142) indicate, these instances have to be considered as control verbs since they impose selectional restrictions on their subject arguments. In their terms, these verbs are commissive speech act verbs that involve a subject referent that makes a commitment about the state of affairs expressed by the infinitive complement.

In all of the examples (468)–(470), the matrix subject referent intentionally commits the communicative act indicated by the matrix predicate. Accordingly, the subject NP must be an argument of the respective predicate.

- (468) Er droht ihr, sie in ein Heim zu stecken.³⁹⁶
he threatens her her into a asylum to put-INF
'He threatens (her) to put her into a children's home.'
- (469) Als seine Mutter im Sterben liegt, verspricht er ihr widerwillig, den Jakobsweg zu gehen.³⁹⁷
as his mother in dying lies promises he her begrudgingly the Jakob.Way to go-INF
'When his mother was about to die, he promised her to do a pilgrimage along the way of St. James.'
- (470) Als Gott in Gestalt dreier Männer Abraham und Sara besucht und der alternden Frau verheißt, einen Sohn auf die Welt zu bringen, bricht sie unwillkürlich in Lachen aus (Gen 18).³⁹⁸
as God in guise three-GEN men-GEN Abraham and Sara visits and the ageing woman augurs a son on the world to put-INF breaks she involuntarily in laughs out Gen 18
'When God visited Abraham and Sara in guise of three men and augured to the aging woman that she will give birth to a son she involuntarily burst out laughing (Gen 18).'

Once again, it is possible to realise the RECIPIENT argument as a dative NP. However, such cases do not occur frequently in the DeReKo corpus.

Raising infinitives with event modification

Finally, *drohen*, *versprechen* and *verheißen* occur in configurations in which they exhibit a fairly different interpretation. Whereas all the uses discussed above belong to the class of commissive speech act verbs, they sometimes appear as uses in which their precise meaning cannot be captured very easily. Thus, some authors conclude that they are modal or aspectual auxiliaries. Accordingly, Drosdowski et al. (1984, 94) argue that *drohen* acts as a *modifizierendes Verb* as

³⁹⁶DeReKo: BRZ09/JUL.22822 Braunschweiger Zeitung, 21.07. 2009.

³⁹⁷DeReKo: RHZ07/MAI.13875 Rhein-Zeitung, 14.05. 2007.

³⁹⁸DeReKo: RHZ07/FEB.09600 Rhein-Zeitung, 10.02. 2007.

modifying verb. Yet, for some reason they do not make any mention of an analogous use of *versprechen*. In an earlier edition of the *Duden*-grammar, Grebe et al. (1966, 528) both verbs are attested with a interpretation different from their commissive speech act reading.

As it is commonly assumed, this difference in interpretation is reflected by a drastic change in the argument structure as well. Based on the observation made by Bech (1955, 113, 126), most authors such as Askedal (1997b, 13), Reis (2005b, 127, 135; 2007, 21, 32), Wurmbbrand (2001, 205) conclude that these uses lack a referential subject argument and the RECIPIENT argument. As Colomo (2011, 233) points out, the raising uses of *drohen* and *versprechen* behave very differently to the raising verb *scheinen* in this respect, which can realise its dative object under any circumstance.

As the examples (471) and (473) indicate, these verbs can select infinitives that do not involve referential subject arguments. Similar examples are provided by Reis (2005b, 135; 2007, 21). Moreover, Reis (2005b, 139; 2007, 27) demonstrate that *drohen* is transparent with respect to voice: it will yield the same interpretation no matter whether it embeds a proposition based on an active verb or its passivised counterpart. All these facts indicate that *drohen* and *versprechen* involve a variant that has to be analysed as a raising pattern.

- (471) Es droht zu regnen, doch das stört die vielen Schwimmer an diesem
 it threatens to rain-INF but this bothers the many swimmers on this
 Sonntagmorgen kaum.³⁹⁹
 Sunday.morning hardly
 ‘It threatens to rain but this does not bother the many swimmers on this Sunday morning.’
- (472) Selten war die Kampfkraft der „Bild“-Zeitung so beansprucht wie in der
 rarely was the fighting.power the-GEN Bild-newspaper so challenged as in the
 vergangenen Woche, als Doktor Guttenberg zerschossen zu werden
 passed week when Doktor Guttenberg obliterate-PPP to become-INF
 drohte.⁴⁰⁰
 threatened
 ‘The fighting power of the „Bild“ newspaper was rarely so challenged as in the past week
 when Doktor Guttenberg was in threat of being dishonoured.’
- (473) Es verspricht, ein schöner Tag zu werden.⁴⁰¹
 it promises a beautiful day to become-INF
 ‘It promises to be a beautiful day.’
- (474) „Juchzet, frohlocket!“ heißt es ganz programmatisch, und das dargebotene
 cheer rejoice calls it very programmatically and the presented
 Liedgut verspricht so vielfältig zu sein wie des Showmans
 repertoire promises so manifold to be-INF as the-GEN showman-GEN
 Kostüme.⁴⁰²
 costume

³⁹⁹DeReKo: NUZ09/JUN.02681 Nürnberger Zeitung, 29.06. 2009.

⁴⁰⁰Spiegel 9/2011, 28.2. 2011, p. 141.

⁴⁰¹DeReKo: HAZ08/MAI.05336 Hannoversche Allgemeine, 29.05. 2008.

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‘“Cheer, rejoice!” it says very programmatically and the presented repertoire promises to be as manifold as the showman’s costumes.’

As Łukasz Jędrzejowski (pers. commun.) has suggested, *verheißen* is due to its semantic affinity to *versprechen* another promising candidate for the raising pattern sketched above. And indeed, it is occasionally attested in raising like configurations (475)–(476).

- (475) Ein Höhepunkt verheißt das Wochenende vom 22. bis zum 24. Mai zu
a highlight promises the weekend from 24 until to.the 24 may to
werden.⁴⁰³
become-INF
‘The weekend from 22nd until 24th of May promises to become a highlight.’
- (476) Mit den sechs neuen Vereinen, den beiden Viernheimer Clubs, St. Ilgen, Leimen,
with the six new clubs the both Viernheimer clubs St. Ilgen Leimen
Bammental und Treschklingen verheißt es eine spannende Runde zu
Bammental and Treschklingen promises it a exciting season to
werden.⁴⁰⁴
become-INF
‘With the six new clubs, the two clubs from Viernheim, St. Ilgen, Leimen, Bammental and
Treschklingen, it promises to be an exciting season.’

Unfortunately, due to the low frequency of the occurrences, no instances could be found that unambiguously exemplify the diagnostics of a raising verb. The classification as a raising verbs is undertaken based on mere semantic analogies to the raising verb *versprechen*.

As it has already been indicated above, the three verbs do not behave in the same manner. First of all, there is a subtle difference in the argument structure concerning the realisation of the THEME argument. Secondly, it has been observed by Askedal (1997b, 17) and Diewald and Smirnova (2010, 205, 214) that the raising uses of *versprechen* are considerably rarer than the raising uses of *drohen*. According to Askedal, only 12 tokens out of 650 are raising verbs in the case of *versprechen*. In opposition, *drohen* occurs as a raising verb in 96 cases out of 279. This contrast calls for an explanation. Thirdly, the raising use of *versprechen* is almost restricted to the selection of the infinitive *zu werden*, cf. Colomo (2011, 237) for a related observation.

Apart from that, the three verbs have a couple of characteristics in common. To start with, it has often been remarked that the raising uses of *drohen*, *versprechen* and *verheißen* are restricted to the selection of predicates that refer to an event in the future, cf. Reis (2001, 312 Fn. 40; 2005b, 130; 2007, 14) and Colomo (2011, 236). In this respect, these verbs crucially differ from the epistemic modal verbs discussed above and from the raising verb *scheinen*. Moreover, there are semantically related variants of these verbs that do not select any infinitive complement, as Askedal (1997b, 15), Reis (2007, 14) and Diewald and Smirnova (2010, 194, 208) have illustrated. Sometimes, these patterns are referred to as ‘uses with non-agentive/inanimate subject referent’. In this point, *drohen*, *versprechen* and *verheißen* behave very differently than

⁴⁰²DeReKo: HMP06/DEZ.02074 Hamburger Morgenpost, 21.12. 2006.

⁴⁰³DeReKo: RHZ09/FEB.23166 Rhein-Zeitung, 25.02. 2009.

⁴⁰⁴DeReKo: M06/AUG.65563 Mannheimer Morgen, 19.08. 2006.

the traditional epistemic modal verbs which always require an infinitive complement in order to express an epistemic meaning. Again, *drohen* is by far the most frequent in this configuration. In contrast, *versprechen* and *verheißten* only occur occasionally in such a pattern.

- (477) Nach einem relativ milden und sonnigen Tag gestern, drohen dem
 after a relatively mild and sunny day yesterday threaten the
 Urlaubsparadies ab heute neue Unwetter.⁴⁰⁵
 holiday.paradise from today new thunderstorms
 ‘After the relatively mild and sunny day yesterday, the holiday paradise is threatened by
 new thunderstorms today.’
- (478) 5-Tage-Prognose: Das Wochenende verspricht uns kaum Sonne.⁴⁰⁶
 5-day-forecast the weekend promises us hardly sun
 ‘5-day-forecast: the weekend does not promise us much sun.’
- (479) Anderes Wetter verheißt uns der Silvestertag.⁴⁰⁷
 other weather augurs us the new.year.eve
 ‘The New Years Eve promises us a different weather.’

In contrast to their cognates that involve a raising structure, all of the verbs are attested with a dative object. As the interpretation is almost identical, it is somehow surprising that the RECIPIENT argument can be realised once no infinitive complement is selected. The dative object is most often found with *drohen*, whereas it is rarely realised with *versprechen* and *verheißten*.

As it turns out, the raising uses of *drohen*, *versprechen* and *verheißten* are the result of a rather recent process. The earliest examples of *drohen* with a raising infinitive complement date from the 18th century. In the examples (480)–(481), a commissive interpretation is not very plausible.

- (480) O lindre mein Gefühl! – die Brust droht zu zerspringen⁴⁰⁸
 o allay my sentiment the breast threatens to burst-INF
 ‘O, allay my sentiment – the breast threatens to burst.’
- (481) Hochher tobt er in hüpfendem Sprung, und zerschmetterte Waldung // Kracht;
 high riots he in bouncing jump and shattered forestry cracks
 doch stets unaufhaltsam enttaumelt er, bis er erreicht // Ebenen Grund; dann
 yet always inexorably tumbles he until he reaches even ground then
 rollt er nicht mehr, wie gewaltig er andrang: Also droht’ auch
 rolls he NEG more how powerfully he closer.gets accordingly threatened also
 Hektor zuerst, bis zum Ufer des Meeres // Leicht hindurchzudringen
 Hektor first until to.the shore the-GEN sea-GEN easy pass
 der Danaer Schiff’ und Gezelte, Mordend;⁴⁰⁹
 the-GEN Danaian-GEN ship and tents-GEN murdering

⁴⁰⁵DeReKo: M01/NOV.86982 Mannheimer Morgen, 14.11. 2001.

⁴⁰⁶DeReKo: V99/MAR.11078 Vorarlberger Nachrichten, 05.03. 1999.

⁴⁰⁷DeReKo: A98/DEZ.83932 St. Galler Tagblatt, 28.12. 1998.

⁴⁰⁸Friedrich Wilhelm Gotter *Elektra*, II, 2, Weimar (1772), (printed in *Gedichte*, vol II, 45).

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‘He is rioting in bouncing jumps and shattered forestry bursts, yet always inexorably tumbles away until he reaches even ground. Then he stops rolling even if he approached in a powerful manner. Accordingly Hektor also threatened to easily pass through murdering to the Danaian ships and tents as far as the shore of the sea.’

An interesting contrast is provided by examples from two different translations of Homer’s *Odyssey*. In the late 18th century, Voss employs the raising verb *drohen* to indicate an imminent event (482). In an earlier translation, more than 200 years before, Schaidenreisser uses another circumscription based on the adverb *schier* ‘almost’ (483). This could be an indicator that *drohen* with this particular function did not exist in the 16th century.

- (482) Aber da eben jetzo der Ölbaumknittel im Feuer // Drohte zu brennen, [...] but as just now the olive.pole in.the fire threatened to burn-INF zog ich ihn eilend zurück aus dem Feuer,⁴¹⁰ pull I it swiftly back out the fire ‘But as the pole of olive threatened to burn in the fire, I swiftly pulled it out of the fire again.’
- (483) Und da der oelbeümin pfal wol erhitzt war/ und schier glueend worden⁴¹¹ and when the olive-ADJ pole well heated was and almost glowing became ‘And as the pole of olive was well heated and almost started to glow’

These findings correspond to the results of the investigation carried out by Diewald and Smirnova (2010, 271). According to their perspective, the first unambiguous instances of *drohen* with a raising pattern are attested in the late 18th century. As Diewald and Smirnova (2010, 287) further point out, *versprechen* appears to have undergone the same development much later. They attest the first uses of *versprechen* with a raising pattern to the early 19th century. But possibly, this is due to the circumstance that the raising pattern of *versprechen* is generally much harder to find.

Turning to *verheißten*, the situation reflects the observations made by Diewald and Smirnova (2010, 287). Just as its semantic counterpart *versprechen*, the verb *verheißten* is attested as a raising verb in the early 19th century.

- (484) und möge in Hamburg, das einst für die vaterländische Bühne so viel war und and may in Hamburg that once for the Fatherland-ADJ stage so much was and so viel wieder zu werden verheisst, nichts den guten Absichten eines so much again to become promises nothing the good intention a-GEN Schröders in den Weg treten!⁴¹² Schröder-GEN in the way step-INF ‘And may there be nothing that prevents that the good intentions of Schröder become true in Hamburg which once was so important for the stage of the Fatherland and which promises to become it again.’

⁴⁰⁹*Illias*, XIII, 140, translated by Heinrich Voß, (1793).

⁴¹⁰*Odyssee*, IX, 140, translated by Heinrich Voß, (1781).

⁴¹¹*Odyssea* IX, p. XXXIX, translated by Simon Schaidenreisser, (1537).

⁴¹²*Morgenblatt für gebildete Stände* N° 16, Freitag 18. Januar (1811), p. 64.

For all of the three verbs, the so-called uses with inanimate subject referents such as in (477)–(479) are an important landmark in their process of grammaticalisation. Before *drohen*, *versprechen* and *versprechen* could acquire their raising pattern, they had already developed non-agentive patterns without infinitive complements. As Diewald and Smirnova (2010, 271) illustrate, *drohen* is attested with non-agentive uses at least from Middle High German. In contrast, *versprechen* could only be found in such configurations in the late 18th century, cf. Diewald and Smirnova (2010, 287).

After having reviewed the origin and the characteristic of these three verbs, the question arises as to how these patterns can be captured. A couple of different analyses have been elaborated. On the one hand, there are authors such as Askedal (1997b, 14) and Wurmbrand (2001, 205) who argue that the raising patterns of *drohen* and *versprechen* have to be considered as epistemic modal verbs. As Askedal (1997b, 14) argues, they behave like epistemic modal verbs in that (i) they always select obligatorily coherent infinitive complements, (ii) they fail to licence VP anaphora, (iii) they never occur in non-finite forms (bare infinitive, *zu*-infinitive, past participle), (iv) they cannot be used as a imperative and that (v) they do not impose selectional restrictions on their subject argument.

However, on closer inspection, it turns out that the raising patterns *drohen* and *versprechen* (and *verheißen*) behave fairly differently from the traditional epistemic modal verbs. First of all, Askedal's characterisation of these raising uses is not entirely correct. As Reis (2005b, 140; 2007, 29) and Colomo (2011, 271) *drohen* and *versprechen* do not always occur in configurations that exhibit the word order that is crucial for obligatory coherence. Rather, they exhibit a pattern that obviously could be regarded as an instance of a pattern called "Third Construction". Furthermore, Reis (2005b, 133; 2007, 17) and Colomo (2011, 260ff.) indicate that raising uses of *drohen* and *versprechen* are attested with non-finite forms such as bare infinitives and past participles. Thus the analogies between these raising verbs and the traditional epistemic modal verbs are by far less striking than Askedal (1997b, 14) suggests.

Moreover, authors like Askedal (1997b, 14) and Wurmbrand (2001, 205) ignore a couple of essential differences between *drohen* and *versprechen* on the one side and the traditional modal verbs on the other side. As Reis (2005b, 129; 2007, 13) and Colomo (2011, 241ff.) demonstrate, they can readily occur in environments in which epistemic modal verbs are excluded or almost excluded: such as embedded under a past tense operator or in questions. Furthermore, Reis (2001, 312 Fn. 40; 2005b, 130; 2007, 14) and Colomo (2011, 236) have shown that the raising uses of *drohen* and *versprechen* are restricted to the selection of predicates that refer to a future event. As it will be demonstrated in Section 5, the essential characteristic of epistemic operators is the ability to embed predicates that refer to a present state or to an event in the past. Apart from that, it has been shown above (477)–(479) that *drohen* and *versprechen* have uses that are semantically related to the raising patterns but they do not involve infinitive complements. In contrast, epistemic modifiers always require some sort of clausal complements such as bare infinitives. Finally, *drohen* and *versprechen* always select *zu*-infinitives rather than bare infinitives. In opposition to *brauchen*, the infinitive particle *zu* cannot be dropped in any context.

An alternative analysis has been elaborated by Reis (2005b, 140; 2007, 18) who considers the raising uses of *drohen* and *versprechen* as temporal-aspectual verbs. As she points out, they share a couple of characteristics with *beginnen* 'begin', *anfangen* 'begin', *aufhören* 'stop'. In more detail, she shows that all these verbs exhibit to the same extent the Third Construction

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pattern. Whereas the traditional temporal-aspectual verbs are specified for the first or the last phase of a particular event, she demonstrates that *drohen* and *versprechen* describe the phase that immediately precedes that event.

The reasoning undertaken by Reis is plausible, as there are other temporal-aspectual verbs in German that exhibit a similar semantic specification such as *anschicken* ‘to be about to’. However, it has been observed that the core class of temporal-aspectual verbs is rather reluctant to embed passivised infinitive complements, as it has been documented by Haider (1993, 244), Reis (2005b, 135 Fn.8) and Colomo (2011, 290). In opposition, the raising uses of *drohen* and *versprechen* are occasionally attested with infinitives that are passivised, as it is illustrated in example (472). Does this indicate that these verbs cannot be considered as temporal-aspectual verbs? As it turns out, there is a group of temporal-aspectual verbs in German that are also attested with passivised complements. Interestingly, it is precisely the temporal-aspectual verb *anschicken* which is semantically very close to *drohen* and *versprechen*, as it is specified for the phase immediately preceding the event.

- (485) Haider's FPÖ schickt sich an, erstmals in der Geschichte an einer
 Haider-GEN FPÖ is.about REFL on first.time in the history at a
 österreichischen Regierung beteiligt zu werden.⁴¹³
 Austrian government participate-PPP to PASS.AUX-INF
 ‘Haider’s FPÖ is about to participate in an Austrian government for the first time in history.’
- (486) Nun aber schicken sich Pavel Pardo und Ricardo Osorio an, in den Annalen
 now but are.about REFL Pavel Pardo and Ricardo Osorio on in the annals
 des Ländles verewigt zu werden.⁴¹⁴
 the-GEN LändleGEN immortalise-PPP to PASS.AUX-INF
 ‘But now, Pavel Pardo and Ricardo Osorio are about to be immortalised in the annals of the
 Ländle.’

The existence of examples like (485)–(486) is a further support for the analysis elaborated in Reis (2005b, 140; 2007, 18).

Colomo (2011, 290) alternatively suggest that the raising verbs *drohen* and *versprechen* constitute together with other raising verbs *scheinen* and *pflügen* the natural class of semi-modal verbs. However, as it has been illustrated by Reis (2007, 17) and in Section 4.2.11, *drohen* and *versprechen* differ from *scheinen* in more respects than from the temporal-aspectual verb *anschicken*. At this point, it appears that Reis’ account is the one with the most explanatory power.

4.2.13 Summary

As it has been indicated in Section 4.1.4, the six traditional modal verbs do not constitute a consistent and homogeneous class. In order to find out as to which extent it is possible to provide an alternative classification, the previous sections have thoroughly investigated the following 14 elements which are often considered as modal verbs in German by various authors.

⁴¹³DeReKo: RHZ00/JAN.14751 Rhein-Zeitung, 27.01. 2000.

⁴¹⁴DeReKo: HMP07/MAI.01447 Hamburger Morgenpost, 15.05. 2007.

(487) *können, müssen, wollen, sollen, dürfen, dürfte, mögen, möchte, brauchen, werden, scheinen, drohen, versprechen, verheißen*

Based on the observation that there are not many verbs in German that could be considered as epistemic modal verbs, the availability of an epistemic interpretation became the guiding criterion in the preceding sections. Moreover, it turned out that epistemic modality can be characterised by means of two essential properties: (i) first of all, an epistemic operator indicates that the embedded proposition is not part of the deictic centre's (speaker's) knowledge (CoDeC). Secondly, (ii) epistemic operators can embed predications between an identified subject referent and a predicate that refers to a state that cannot be changed or an event in the past.

There are at least two ways of defining a class of modal verbs based on the concept of epistemic modality. Each of them has a different implication regarding the extension of the class. According to the stronger definition put forth by Öhlschläger (1989, 132), Engel (1996, 463), Diewald (1999, 1) and Reis (2001, 287), it is possible to define a class of modal verbs in German in terms of poly-functionality. This refers to the class of verbs that involve two different types of modality.

(488) Strong definition of modal verbs

A modal verb is characterised by the availability of a circumstantial modal interpretation and an epistemic modal interpretation.

Corresponding to this definition, any verb that exhibits a circumstantial modal interpretation next to an epistemic one would be considered as a modal verb. Any verb that has only a circumstantial or an epistemic reading but lacks the other one would be exempt from this class.

Based on the observations undertaken in the preceding Sections 4.2.1-4.2.12, the following distribution of modal readings is yielded. In the case study on *sollen* in Section 4.2.6, it has been illustrated that epistemic and reportative interpretations are by no means equivalent. Thus, they are carefully distinguished in the remainder of this section. Furthermore, it has been revealed that the subjunctive of the past forms *dürfte* and *möchte* have acquired a non-compositional interpretation and, thus, they have to be analysed as independent lexical elements. Moreover, the traditional preterite present *mögen* is constantly used less and less with infinitive complements and seems to disappear with certain modal uses.

1. **Circumstantial, epistemic and reportative:** *sollen, ?wollen*
2. **Circumstantial and epistemic:** *können, müssen, ?mögen*
3. **Circumstantial and marginally epistemic:** *brauchen*
4. **Only circumstantial:** possibility modal *dürfen, möchte*
5. **Only epistemic:** weak necessity modal *dürfte, werden, ?mögen*
6. **Circumstantial and reportative:** *?wollen*
7. **Not epistemic:** *scheinen*

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8. Not epistemic: *drohen*, *versprechen*, *verheißten*

At this point, it becomes possible to apply the concept of polyfunctionality onto all of the potential candidates that come into consideration for a classification as a modal verb. In doing so, it turns out that the content of the resulting class of modal verbs is fairly different from what is generally expected. There are only two verbs that can be considered as polyfunctional without any restraint: *können* and *müssen*. Apart from that, *brauchen* exhibits a marginally developed epistemic interpretation. Therefore, it would be a rather marginal member of this group. In the case of *mögen* with an infinitive, it is not really clear as to which extent it can still be interpreted in a circumstantial manner. In contemporary standard written German, such an interpretation seems to be absent. Aside from its circumstantial interpretation, *sollen* exhibits a very oblique epistemic interpretation, which is only available when the verb bears the morphology of the subjunctive of the past. In addition, it involves a reportative interpretation. Accordingly, it is not clear which status the reportative modality has for the classification. As it has been shown in Section 4.2.6, reportative modality substantially differs from epistemic modality in semantic respect. Thus, it cannot be fully equivalent to epistemic modality. If reportative modality is seen to be irrelevant for the definition of modal verbs, then *wollen* cannot be regarded as a modal verb neither, unless one accepts that it involves an epistemic concessive pattern as well, as it is suggested in Section 4.2.3. At any rate, there is a whole number of elements that would have to be excluded from the class of modal verbs: *möchte* lacks an epistemic interpretation and it is not generally accepted to which extent it involves a reportative one. Likewise, the possibility modal verb *dürfen* has no epistemic interpretation. Furthermore, there are verbs that do not have a circumstantial modal interpretation, such as *werden* and the weak necessity modal *dürfte*.

As it has been illustrated, the remaining verbs cannot be considered as epistemic as they do not fulfil both of the conditions for epistemic operators stated above: *scheinen* behaves unexpectedly with respect to the CoDeC, as the speaker occasionally knows that the embedded proposition is false. This is hardly ever the case with epistemic modal verbs that are inflected for the indicative. In contrast, *drohen*, *versprechen* and *verheißten* cannot embed any predication that refers to a present state or past event. As a consequence, these verbs will not be taken into consideration for the definition here.

If the class of modal verbs is defined in terms of polyfunctionality, one needs to be aware that its extent will be much smaller than generally expected: there are only two perfect members: *können* and *müssen* and a couple of half-hearted members: *sollen*, *brauchen* and *mögen*. Furthermore, this sort of definition in terms of polyfunctionality faces another challenge. Being based on the concept of circumstantial modality, such an account has to provide a clear cut definition for circumstantial modality as well. As it appears, this is by no means a trivial matter. It is far from obvious as to which extent it is possible to find a uniform definition for all the different types that are generally subsumed under this concept: deontic modality, volitional modality, practical modality, the ability readings of *können*, the emotive readings of *mögen*. It should not be too surprising if these subtypes cannot be unified and if some of these subtypes needed to be excluded.

The approach in terms of polyfunctionality implicitly suggests that all the patterns subsumed under circumstantial modality share some essential characteristics. Yet, as it has been illustrated in the preceding sections that each of the verbs investigated behaves in a fairly idiosyncratic

manner. As it appears, the idiosyncrasies are dominant and it is not clear as to which extent there is any feature that distinguishes them from all the other verbs. In opposition to this, the concept of epistemic modality can be captured without too much ado.

At this point, the question arises what the benefit of a definition of modal verbs in terms of polyfunctionality is from a descriptive perspective? Given the fact that it would not encompass all of the epistemic verbs, this definition would ignore the striking similarities between the epistemic verbs including *werden* and *dürfte*. First of all, they are semantically fairly homogeneous. Furthermore, they behave syntactically in a very uniform way: all of them select bare infinitive complements and all of them involve a raising pattern.

Probably, it is more promising to abandon this attempt in favour of another approach. Alternatively, one could refrain from considering all the non-epistemic patterns of the verbs under investigation and uniquely focus on their epistemic interpretations. In contrast to the strong definition, one could assume that a natural class of (poly-functional) modal verbs does not exist. Yet, it has been demonstrated that the epistemic interpretations of the verbs reviewed so far behave in a fairly uniform manner. Accordingly, they can easily be grouped in a semantically and syntactically homogeneous class. Such an approach has a crucial advantage compared to the definition based on polyfunctionality: it puts together all of the elements that indeed behave in an analogous manner. Moreover, it is the precondition for any attempt to provide a principled explanation of the relation between the formal and functional peculiarities. In opposition, such an account does not make any statement about all of the non-epistemic uses. And it is fairly doubtful whether there is any fruitful generalisation to be made for these uses.

(489) Weak definition

There is no class of modal verbs but there is a class of epistemic modal verbs.

If the two criteria for epistemic modal operators are acknowledged, this definition will result in the following extension:

(490) *kann, könnte, muss, müsste, sollte, dürfte, mag, braucht nicht, wird*

For the sake of precision, indicative forms are distinguished from the subjunctive of the past forms. As it turns out, they are also homogeneous from a syntactic perspective: all of them select bare infinitive complements and all of them involve a raising pattern. Likewise, Reis (2001, 308) already assumes that these syntactic properties appear to be a prerequisite for a verb in order to express an epistemic modality. This conspicuous connection could be revealing for any attempt to explain the nature of epistemic modality.

Whereas this approach captures the epistemic modal verbs in a more consequent way, it leaves enough space for the diversity of the remaining non-epistemic uses. As it is illustrated in the preceding sections, each of the potential modal verbs is ambiguous between several syntactic patterns. And there is no verb that exhibits the identical set of patterns of another potential modal verb: *können* is used as a transitive verb, as a control verb with event modification, as a raising verb with event modification and as a raising verb with propositional modification. In contrast, *wollen* is attested as a transitive verb, as a verb with finite *dass*-clause, as a control verb with event modification, as a negative polar raising verb with event modification, as a control verb with propositional modification and possibly also as a raising verb with propositional

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modification. Moreover, *sollen* can be used as a raising verb with event modification and as a raising verb with propositional modification with reportative or epistemic interpretation. A more detailed overview over the different complement types of each potential modal verb is illustrated in Figure 4.1.

As already pointed out by Lehmann (1995, 33) and Diewald (1999, 2, 34), these different patterns of a particular verb always represent different stages of its grammaticalisation: the transitive uses reflect the original use of the verb, the control verb uses a younger one and epistemic is the most recent one. Accordingly, the diversity of these different readings reflects the history of the particular verb. As each verb has a different origin and an individual development, it is not surprising that there are hardly two verbs that have the identical set of patterns. In the case of the verbs considered above, the patterns become the more uniform the more grammaticalised they are. Each element takes up its individual path of grammaticalisation, and in the case of the verbs discussed above, these paths may converge in the end and finally they become epistemic modal verbs that select bare infinitive complements and that involve raising patterns. Related observations have been made by Lehmann (1995, 25). Therefore, it is much easier to provide a class definition that only considers the epistemic uses than a definition that encompasses other less grammaticalised uses as well.

However, the most important finding that has been revealed by the case studies is the overwhelming diversity of different uses as it has been documented throughout the preceding sections. This diversity of the non-epistemic uses poses a challenge for either of the approaches discussed above. Advocates of the strong definition would need to show that at least some of them can be considered as circumstantial modal uses. In turn, it becomes necessary to provide a clear cut definition of circumstantial modality in order to check which of these can be classified as circumstantial. It is fairly likely that there are some uses that cannot be classified as circumstantial uses such as the transitive uses or uses with finite *dass*- and *wenn*-clauses. As for these cases, advocates of the strong definition would need to come up with an explanation for all those left-over uses. Likewise, the weak decision would need to account for those left-over uses as well. In contrast, it does not need to provide a definition of circumstantial modality that covers as many of the non-epistemic uses.

Given the overwhelming multitude of different patterns and idiosyncrasies, any account needs to be flexible enough to capture this complex network of semantic relations. In more detail, it has to account for two facts. Above all, it has to explain how it is possible that all of the verbs under discussion are ambiguous between up to six semantically related patterns. As it has been shown by Diewald (1999, 27) and Abraham (2003, 2), the relationships between the different patterns is a diachronic one. There are some patterns that have developed from others. Yet, even the most grammaticalised pattern of a modal verb retains the semantics of the original lexical meaning. This indicates that it should be possible to derive younger more grammaticalised patterns always from the previous ones. Secondly, the approach has to explain the fact that each verb involves its individual selection of syntactic patterns. An analysis that captures all the specific uses of one verb does not need to capture all the uses of another verb.

The most obvious approach towards these challenges is one that allows for much variation and specification in the lexicon. A lexicalist theory such as HPSG has great advantages for such a venture. Relations between the different patterns can be easily established by means of lexicon rules and type hierarchies.

	predicative phrases	NP _{acc}	(mit-PP)	<i>dass</i> -clause	<i>wenn</i> -clause	(<i>als</i>) <i>ob</i> -clause	control inf. ev	control dir. ev	raising inf. ev	raising dir. ev	control inf. non ev	raising inf. non ev rep	raising inf. non ev
<i>können</i>	-	ABIL	-	-	-	-	ABIL	ABIL	DEOP, POS	DEOP, POS -	-		x
<i>mögen</i> <i>nicht mögen</i>	-	EMOT	-	EMOT EMOT	(EM), (VOL) -	- -	(VOL) VOL	(VOL) VOL	POS	POS	?	?	x
<i>wollen</i> <i>nicht wollen</i>	-	VOL	-	VOL	-	-	VOL	VOL	- EXT	? EXT	x	? ???	x
<i>möchte</i>	-	VOL	-	VOL	-	-	VOL	VOL	?	?	x	?	?
<i>sollen</i> <i>sollte</i>	-	-	-	-	-	-	-	-	DEON	DEON	-	x	- x
<i>dürfen/</i> <i>dürfte</i>	-	-	-	-	-	-	DEOP	DEOP	-	-	-	-	- x
<i>müssen</i>	-	-	-	-	-	-	-	DEON, NEC	DEON, NEC	-	-	-	x
<i>nicht brauchen</i>	-	REQU	-	-	-	-	REQU	REQU	DEON, NEC	DEON, NEC -	-	-	x
<i>werden</i>	x	-	-	-	-	-	-	-	FUT	-	-	-	x
<i>scheinen</i>	x (+ NP _{dat})	-	-	x (+ NP _{dat})	-	x (+ NP _{dat})	-	-	x ?(+ NP _{dat})	-	-	-	?
<i>versprechen</i>	-	x (+ NP _{dat})	-	x (+ NP _{dat})	-	-	x (+ NP _{dat})	-	x	-	-	-	-
<i>drohen</i>	-	-	x	x (+ NP _{dat})	-	-	x (+ NP _{dat})	-	x	-	-	-	-

Figure 4.1: Complement types of potential modal verbs.

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Summing up, it has been demonstrated that it is no trivial matter to provide a definition of modal verbs that comprise all the elements that are generally held as such. Even the promising attempt to define modal verbs in terms of polyfunctionality has turned out to be treacherous. First of all, it faces the burden of proving that there is a homogeneous class of circumstantial modality and that it captures all of the traditional modals. Moreover, it ignores the verbs that only exhibit an epistemic modal interpretation but no circumstantial one, such as *werden* and *dürfte*. Their epistemic uses would be left unexplained. At this point, the question arises what the benefit is of an account in terms of polyfunctionality.

A less spectacular yet more efficient solution can be attained based on the assumption that there is no homogeneous class of modal verbs. Instead, it can easily be shown that there is a homogeneous class of epistemic modal verbs. In contrast, such an account does not have to make a statement on all the non-epistemic uses. At this point, it is not clear whether there are any useful generalisations to be made for the non-epistemic patterns. Rather, it is sufficient to capture the lexical and semantic relations between each of the patterns. Thus, a homogeneous classification is possible if only the epistemic modal verbs are considered. As it will be shown in Section 8, it is even possible to derive the reportative uses from the epistemic ones by means of the CoDeC and some additional assumptions.

Finally, it is more important to describe and capture all of the attested forms rather than postulating seductive over-simplified generalisations that do not match the empirical evidence. The establishment of a class of epistemic modal verbs is by far less spectacular than assuming the existence of a class of modal verbs. Yet, it is more thoroughly grounded in the data. It could be that it is the term ‘modal verb’ that has caused all this confusion. Possibly, it is just an invention that does not match reality. The next section will provide a brief overview over the history of the term ‘modal verb’ and its original motivation.

4.3 The origin of the term *Modalverb*

In the course of the preceding sections, it has turned out that it is a great challenge to provide an intensional definition of the class of modal verbs. These difficulties could be evidence that the concept *modal verb* suffers from internal contradictions. Unfortunately, notions and terms are sometimes confused in the course of history, occasionally, they are reinterpreted in a less exact manner, sometimes they were not precise enough from the beginning. As Butt (2006, 153) illustrates, the well-known term *ergativity* has a spectacular history. Being misinterpreted, the term *ergative verb* established in the early eighties has developed a meaning that is very far from the original intention. As it turns out, the term *Modalverb* has a remarkable development as well.

The upcoming section will investigate the different definitions of verb classes that concern the six traditional modal verbs. The focus will be drawn on the precise name of the class. Furthermore, the original motivation for the classification will be discussed. As it turns out, there were a lot of different terms and conceptions in competition with each other. It is far from clear as to what precisely caused particular terms to prevail, whereas most of them were forgotten. Furthermore, it will be shown that it is not always the most consistent concept that remains in the scientific memory.

4.3.1 Early grammars: a morphological classification

According to Jelinek (1914, 296), the term *auxiliary* was not used in Latin grammar. It has only been introduced by the French grammarian Pillot in his book *Gallicae linguae institutio* in 1550. Pillot (1550, 21, 24) argues that sometimes in French the use of a *verbum auxiliarium* becomes necessary in order to translate verbs with particular tense morphology from Latin. He discusses two verbs *estre* ('be') and *avoir* ('have'). In much the same spirit, Ölinger (1574, 94) observes that these two auxiliary verbs *sein* ('be') and *haben* ('have') exist in German as well. Aside from that, he observes that *werden* has to be considered as a passive auxiliary in German. Ölinger (1574, 151) also mentions some of the verbs that would be known as modal auxiliaries later in history. As he notes, the five verbs *woellen*, *sollen*, *doerffen*, *koennen* and *moegen* behave unexpectedly in morphological respect. They will not be realised as a *ge*-participle whenever selected by a perfect tense auxiliary but as an infinitive. Yet, he does not consider them as verbs with a particular grammatical function or as auxiliaries. In this time, it were in particular morphological anomalies that had attracted the attention of the scholars. In the same period, Claius (1578, 96) has observed that there are nine verbs that lack suffixes in the 1. and 3. person singular which causes them to appear monosyllabic: *können*, *mögen*, *woellen*, *sollen*, *wissen*, *taugen*, *thuerren*, *düerfen* and *müssen*. Accordingly, he calls them *verba monosyllaba*. Occasionally, he employs *woellen* to circumscribe the Latin suffix for future tense. Yet, he does not associate these verbs with any particular grammatical function.

Much like Ölinger (1574, 94), the influential grammarian Schottel (1663, 550) assumes there are three auxiliary verbs in German: *seyn*, *werden* and *haben*. Furthermore, Schottel (1663, 575, 579ff.) notices that *müssen*, *wollen*, *sollen*, *dürfen*, *können* and *mögen* surface as an infinitive rather than a past participle when they are embedded by a perfect tense auxiliary. Apart from that morphological peculiarity, he treats them together with the group of irregular verbs (*ungleichfließende Zeitwörter*). What makes it particularly interesting to read Schottel's work is that his own use of language differs from his descriptions. Accordingly, he uses two further verbs with IPP, which he does not mention in his enumeration: on the one hand, he employs the raising verb *pflügen* with IPP (cf. Schottel (1663, 243, 1019)) and on the other hand, he uses *wissen* with IPP (cf. Schottel (1663, 67, 144)).

Bödiker (1698, 79), another popular important grammarian, makes a revolutionary assumption. He concludes that two classes of auxiliaries have to be differentiated in German. Firstly, there are three *merkliche Hülfwörter* 'memorable auxiliaries': *sein*, *haben* and *werden*. The second class is called *gleichsam hülfwörter* 'quasi auxiliaries': *muessen*, *sollen*, *wollen*, *moegen*, *koennen*, *duerfen*, *wissen*, cf. Bödiker (1698, 109). His definition is above all morphologically motivated:⁴¹⁵

Drittens ist zu mercken/ daß insonderheit diese verba gleichsam *auxiliara*, *muessen*/ *sollen*/ *wollen*/ *moegen*/ *koennen*/ *duerfen*/ *wissen*/ ein doppelt *participium* haben auf et und en. Oder daß sie wenn ein ander *verbum* dazu koemmet/ als denn im *perfecto* keine *praeposition* ge haben/ sondern dem Infinitivo gleich außgesprochen werden. Als ich muß ich habe gemußt *absolutè*. Aber hergegen wenn ein ander *verbum* (in infinitivo) dazu koemmet/ so heisset es *muessen*. Ich habe *muessen* hoeren/ Ich habe *muessen* strafen. Also: ich kan/ ich habe gekont/ *absolutè*. Aber

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in dem ein ander *infinitivo* dazu koemmet so heist es koennen: ich habe koennen dencken. Er haette koennen sagen. Also auch: ich weiß/ ich habe gewußt/ *absolutè*. Koemt ein *Infinitivus* dazu/ so heisset es wissen. Er hat wissen zu sagen. Er hat wissen einzuwenden. Du hast es wissen zu verbergen.

Furthermore, Bödiker (1698, 101) acknowledges that *pflügen* ‘to be wont to’ exhibits the IPP as well, soon as it is used with a *foleo* interpretation. However, it is not clear as to why he did not consider it as a ‘quasi auxiliary’ just as all the other verbs that exhibit the IPP. Once again, the definition is grounded on a clear morphological criterion. Yet, it remains mysterious as to why Bödiker (1698, 109) has decided to treat these verbs as ‘quasi auxiliaries’ rather than as usual irregular verbs just as the other irregular verbs are. Hence, an explicit motivation in terms of their function in grammar is missing.

In contrast, Adelung (1782, 772) rejects Bödiker’s approach. According to his perspective, auxiliaries are only those elements which are necessary to circumscribe verbal morphology in Latin such as tense and passive suffixes. Correspondingly, he only considers *seyn*, *haben* and *werden* as genuine auxiliaries. Furthermore, he explicitly excludes ‘incomplete predicates’ from his concept of auxiliary, such as *wollen*, *mögen*, *sollen*, *lassen*, *müssen*, *können*:⁴¹⁶

Nur solche sind Hülfswörter, durch deren Hülfe die zum Muster genommene Lateinische Conjugation umschrieben wird, und deren sind nur drey ‘seyn’, ‘haben’ und ‘werden’, welche insgesamt Intransitiva sind und irregulär conjugiret werden.

‘Incomplete predicates’ are essentially characterised by the circumstance that they require a further verbal complement, an infinitive.

Summing up, the early descriptions of the six traditional modal verbs can be characterised as follows. Most grammarians from the 16th until the late 18th century assume that there are a couple of auxiliaries in German. There is a wide spread consensus about three verbs *sein*, *werden* and *haben*, which are generally regarded as auxiliary verb. This classification is motivated by the circumstance that they become necessary in order to translate analytic tenses or passive suffixes from Latin into French or German. Implicitly, these authors assume that these verb contribute rather grammatical information such as temporal specifications rather than lexical meaning. It is fiercely contested to which extent the traditional modal verbs should be held as auxiliaries as well. They have attracted attention due to their morphological anomaly. Yet, none of the authors that advocate a classification as auxiliaries provide a clear motivation for their consideration.

⁴¹⁵Thirdly, it has to be noticed that these verbs being virtually *auxiliaria*: *muessen*, *sollen*, *wollen*, *moegen*, *koennen*, *duerfen*, *wissen*. involve two different types of [past] *participium*, ending *et* and *en*. Or whenever another *verbum* joins them, they will not have the *praeposition* *ge* in *perfecto* [tense] but will be pronounced like the Infinitivo, as *ich muß ich habe genußt absoluté*. But whenever another *verbum* (in infinitivo) is attached it goes *muessen*. *Ich habe muessen hoeren/ Ich habe muessen strafen*. Alike: *ich kan/ ich habe gekont/ absoluté*. But as soon as another *infinitivo* is attached it goes *koennen*: *ich habe koennen dencken. Er haette koennen sagen*. Alike: *ich weißich habe gewußt absoluté*. If an *Infinitivus* is attached it goes *wissen*. *Er hat wissen zu sagen. Er hat wissen einzuwenden. Du hast es wissen zu verbergen*. [Translated by J.M., the highlighted items are already contained in the original text.]

⁴¹⁶Only those verbs can be considered as auxiliaries that correspond to a morphem of inflection in Latin. There are three of those *sey*, *haben* and *werden*, all of them intransitive and exhibit irregular conjugation. [Translated by J.M.]

In this period, the six traditional modal verbs are not associated with a particular grammatical function.

This does not change when Grimm (1822, 851, 1053) reveals the nature of this class which attracted much attention in morphological respect. As he illustrates, the singularity of the morphological class *verba zweiter anomalie* ‘verbs of the second anomaly’ is due to their origin: they reflect former preterite tense forms that have acquired present tense meaning. Furthermore, Grimm (1822, 853) has already noted that *wollen* does not belong to this class.

Interestingly, Grimm (1822, 851) introduces the morphological class of *verba zweiter anomalie* in a small section that discusses auxiliaries. According to his perspective, they are additionally characterised in their high frequency:⁴¹⁷

Auxiliaria, d.h. verba, welche sehr häufig gebraucht werden und statt ihrer lebendigen bedeutung abstracte begriffe annehmen, tragen gewöhnlich solche unregelmäßigkeiten an sich.

Even if Grimm (1822, 851) discusses the preterite presents and the former subjunctive of the past *viljan* in the context of auxiliaries, he does not attribute any particular grammatical function to them. Until this time, the traditional six modal verbs are only considered as a class in morphological respect. Usually, other preterite presents are also considered. Yet, these verbs are not associated with any specific grammatical functions, yet.

Other overviews over the treatment of the six traditional modal verbs in early grammars have been elaborated by Jellinek (1914, 296 ff.), Öhlschläger (1989, 19–21) and Johnen (2006) with different results and focusses. Redder (1984, 303–329) and Öhlschläger (1989, 21ff.) provide an extensive overview over the discussion in the 20th century.

4.3.2 Karl Ferdinand Becker (1836): From a morphological classification to a grammatical one

The description of the auxiliaries in German elaborated by Becker (1836, 174–186), is one of the crucial landmarks in the history of the term *modal verb*. Whereas former definitions were only motivated by their morphological anomaly, Becker associates these verb with a particular grammatical function and justifies their status as auxiliary verbs. Moreover, he is the first who tries to provide a systematic semantic description of this class. In doing so, he has discovered a whole range of phenomena.

Couple of years ahead Becker, Heyse (1822, 402) makes the first attempt to provide a functional motivation for the definition of a modal auxiliary like class. As he assumes, there are various classes of auxiliaries in German. Among them, there are seven *Huelfsverba welche den Modus umschreiben* ‘auxiliaries which circumscribe mood’: *dürfen, können, lassen, mögen, müssen, sollen, wollen*. A further criterion for his concept of auxiliary-hood seems to be their requirement for a further infinitive complement, as illustrated in Heyse (1822, 403). Yet, he does not become very explicit in this matter.

⁴¹⁷ Auxiliaries, that is verbs which are very frequently used and which assume abstract concepts rather than their vital meaning, usually exhibit such anomalies.[translation JM]

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In contrast, Becker (1836, 176 §91) explicitly argues that every language has its proper *Huelfsverben des Modus* ‘auxiliaries of mood’. Their function is to express the possibility or necessity of the embedded predication. In other words, any modal verb is either a verb that expresses a possibility or a necessity. Furthermore, Becker (1836, 178) concludes that there are three different types of possibilities and necessities that an auxiliary of mood can express: physical, moral and logical. In his main classification, he considers *können*, *dürfen* and *mögen* as possibility verbs and *müssen*, *sollen* and *wollen* as necessity verbs. Apart from that Becker (1836, 182), Becker (1841, 222) explicitly regards the AcI verb *lassen* as an auxiliary of mood, as it can express both a necessity (causative) reading and possibility (permissive) reading. Apart from that, Becker (1836, 177 §91) explicitly notices at some earlier point that *brauchen* is an auxiliary of mood. For some reason, he did not consider it in the general classification in §92 and §93. Interestingly, it appears in the second revised edition in this classification in which it is treated as verb of a moral necessity, cf. Becker (1842, 220 §91, 224 §93).

The morphological aspect appears to be less important does not seem to be for Becker’s definition. There are only scarce references to the morphological peculiarity of the verbs he considered. At one point, Becker (1836, 176 §91) remarks that the auxiliaries of mood display an anomalous conjugation pattern which is due to their development: they are past forms that have acquired present tense meaning. In doing so, he is the first grammarian that does not focus on the morphology of these verbs. The fact that Becker (1836) does not mention their morphological anomaly should arouse suspicion. And indeed, in ignoring the morphological nature of the six traditional modal verbs, he avoids a couple of contradictions that would become apparent, otherwise. First of all, he considers two verbs as auxiliaries of mood that neither have a preterite present origin nor they adopt a corresponding morphological paradigm: *lassen* and *brauchen*, as it is illustrated in Becker (1836, 177 §91; 1836, 182; 1841, 222, 1842, 220 §91, 224 §93). Apart from that, his definition also faces challenges in semantic respect. Building on the assumption that modal verbs express possibilities and necessities, Becker (1836, 178) cannot properly capture epistemic *duerfte*, which he considers as a verb that expresses a probability. In his definition, Becker adopts a perspective that is fairly exceptional for a grammarian of his time. This could be due to the fact that he was not educated as a grammarian but rather as a physician who only developed his linguistic interest when he was older than 30. Even if his definition may suffer from inconsistencies, he has nevertheless contributed a couple of ground-breaking discoveries.

Likewise, Heinrich Bauer (1827, 93) assumes in the first volume of his grammar *Vollständige Grammatik der neuhochdeutschen Sprache* that there are various types of *Hilfszeitwörter* ‘auxiliaries’ in German. Aside from *haben*, *sein* and *werden*, the incomplete predicates such as *können*, *sollen*, *müssen* can also be considered as such. He becomes more explicit in the third volume of his grammar. Following the work of Becker, Bauer (1832, 489–492) concludes that there are seven verbs that can be considered as *Huelfsverben des Modus*.

Another important definition has been developed by Schoetensack (1856, 269, 293). Apart from the consensual auxiliaries *haben*, *sein* and *werden*, there are a various verbs, which he considers as auxiliaries as well. According to Schoetensack (1856, 291), *bleiben* ‘stay’, *stehen* ‘stand’, *kommen* ‘come’ and *gehen* ‘go’, have to be treated as auxiliaries as well. Furthermore, he suggest to consider the AcI verbs and the temporal-aspectual verbs as auxiliaries too. In most of the cases, he does not provide a grammatical or functional motivation for his clas-

sification. Accordingly, his concept of auxiliary remains fuzzy. As it appears, the selection of infinitive complements plays an important role for his definitions. In a section on irregular verbs, Schoetensack (1856, 267, 269) six verbs as *Huelfsverben* ‘auxiliaries’ *können, wissen, mögen, sollen, müssen, dürfen*. These verbs are identical to the preterite presents that are still in use in New High German, including *wissen*. As he stresses, *wollen* is not part of this class, as it has not undergone the same development. Apparently, the driving force behind this definition is one that is based on diachronic morphology. In a subsequent section, Schoetensack (1856, 293) introduces the class of *modale Hilfsverben* ‘modal auxiliaries’ comprising seven verbs: *mögen, wollen, können, sollen, müssen, dürfen* and *lassen*. After the nomenclature defined by Becker (1836, 176), that is a further step towards the contemporary term ‘modal verb’. In opposition to the previous classification, *wissen* is excluded from the class and *wollen* and *lassen* are integrated. Yet, Schoetensack (1856, 297) acknowledges that *lassen* belongs to a different inflectional pattern than most of the other ‘modal auxiliaries’. Accordingly, Schoetensack’s term ‘modal auxiliary’ appears to be motivated in a semantic or grammatical way. Yet, he does not become very explicit about this matter. In another context, Schoetensack (1856, 558) remarks that modal auxiliaries in German are sometimes used to translate and substitute mood. But they do not systematically replace mood since they also inflect for the subjunctive. This could be a hint that his term ‘modal auxiliary’ is grounded on a functional motivation. Apart from that, Schoetensack (1856, 295) considers the verb *brauchen* as an ‘auxiliary’ that is used to negate *sollen*. At this point, it remains unclear whether he considers it as a ‘modal auxiliary’ or some other auxiliary. Finally, Schoetensack (1856, 298): discusses the IPP. In this context, he uses the more general term *Zeitwort* ‘verb’ rather than *Huelfsverb* ‘auxiliary’. This group also contains elements which have been characterised as auxiliary in a previous section: *hören, heißen, sehen, helfen, lassen, sollen, wollen, mögen, dürfen, müssen, wissen, können, fühlen, lehren* and *lernen*.

As it has been revealed, Schoetensack (1856) uses the term ‘auxiliary’ in an inflationary manner. In most cases, it is not evident what particular characteristic he associates with it. At some point, he seems to motivate the class of modal auxiliaries in a functional way. This class is almost identical with the six remaining preterite presents including *wissen*, which form a homogeneous group in morphological respect and which he only considers as ‘auxiliaries’. At this point, it remains mysterious as to how the class of preterite presents and the class of ‘modal auxiliaries’ relate to each other according to the perspective taken by Schoetensack (1856). Moreover, it is evident that his conception suffers from the same conflict as Becker’s definition: on the one hand, he tries to motivate the class in terms of morphological characteristics and on the other hand, he suggest a semantic definition of the class based on the concepts necessity and possibility. Yet, the two motivations do not converge. The morphological part of this definition yields another extension than the semantic part.

Much in the spirit of Becker (1836) and Schoetensack (1856), Vernaleken (1861, 94), a grammarian with descriptive ambitions, postulates a class of *modale Hilfsverben* ‘modal auxiliaries’, which encompasses six elements: *sollen, müssen, mögen, können, dürfen, wollen*. His definition deserves closer attention as he uses a term that is almost identical to the contemporary use and moreover he suggests an extension that precisely corresponds to the traditional six modal verbs. As he argues, the term *Modalität* ‘modality’ refers to the morphological anomaly of these verbs and their ability to express a *Nothwendigkeit, Möglichkeit und Zulässigkeit des ausgesagten* ‘necessity, possibility and permissibility of a proposition’. As this indicates, Vernaleken’s approach

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is a strong simplification. In opposition to his two predecessors, he ignores the semantically related verbs *brauchen* and *lassen* in his description. Apart from that, it remains to be shown that these six verbs fulfil his semantic requirement.

Before Vernaleken, Friedrich Bauer (1850, 102 §166), whose grammar is the predecessor of the *Duden* grammar, has already suggested a class of *Hilfszeitwörter* ‘auxiliaries’ that comprises the six traditional modal verbs *wollen*, *können*, *mögen*, *sollen*, *müssen* and *dürfen*. Yet, Bauer (1850, 30 §66) is by far less explicit in his motivation and seems to be above all interested in their irregular morphology and refers to them as *abweichende Verben* ‘deviate verbs’. Yet, he appears to have a functional criterion in mind as well as he explicitly compares them to *werden* which is employed to circumscribe future tense.⁴¹⁸

Der Inf. mit *werden* steht zur Umschreibung des Fut. In ähnlicher Weise steht er bei den Hilfszeitwörtern *wollen*, *können*, *mögen*, *sollen*, *müssen*, *dürfen*.

Beginning with Becker (1836), definitions of modal auxiliaries appeared that were not solely grounded on morphologically aspects. Some of the authors of that period associated these morphologically anomalous verbs with a very homogeneous meaning. According to their assumption, each of the verbs either expresses a necessity or a possibility. As it turns out, the set of verbs with preterite present morphology is not congruent with the set of the verbs that express a necessity or a possibility. All of these accounts that are based on this double motivation suffer from the same inconsistencies. Most of the authors ignore the apparent contradictions.

The increasing importance of the semantic motivation is reflected by the nomenclature that has been introduced by Becker (1836). Subsequently to his ground-breaking work, the class is called ‘auxiliary of mood’ and later ‘modal auxiliary’. These terms almost correspond to the standard term used in contemporary grammars of German: *Modalverb*.

4.3.3 Blatz (1896)

In the late 19th century, it is generally accepted that there are more auxiliaries than *haben*, *sein* and *werden*. Most of the grammarians assume that there is at least another class, which is called modal auxiliaries or auxiliaries of mood. In this period, a further interesting development took place in the late 19th century. When Blatz (1896) published the third edition of his grammar, he discusses a class of verbs that he refers to as *Modalverba* ‘modal verbs’. According to the perspective taken in Blatz (1896, 538 §154), this class encompasses the five preterite presents *können*, *mögen*, *dürfen*, *müssen*, *sollen* and the two verbs *wollen* and *lassen*. In a brief remark, Blatz (1896, 542) also considers *brauchen* as a *Modalverb*. According to his selection of verbs, he favours a definition that is semantically motivated. Moreover, he states that they have a similar function as grammatical mood, yet, they are more specific in their interpretation.

This deserves closer attention as he does not use this expression in the preceding edition of his grammar. In the second edition, Blatz (1880, 649 §396) he chooses the term *Hilfsverben des Modus* ‘auxiliaries of mood’ and in an earlier section *Formzeitwörter der Aussageweise* which corresponds ‘germanised’ version of the original Latin terms, cf. Blatz (1880, 267).

⁴¹⁸The infinitive with *werden* is used to circumscribe future tense. In a similar manner, it is used with the auxiliaries *wollen*, *können*, *mögen*, *sollen*, *müssen*, *dürfen* [Translated by J.M.]

As it appears, something made Blatz change his mind between the year 1880 and 1896, which led him to the decision to use the term *Modalverb*. Yet, it remains fairly mysterious what incidence or influence this could have been. One of the major suspects is of course Henry Sweet, who published in 1891 his influential *New English Grammar. Logical and Historical*. As the subtitle indicates, the investigation is grounded in an explicit logical interest. This leads to the conclusion that he could be the origin of a new terminology that is coined by (modal) logic. Yet, Sweet (1891, 421) turns out to be rather conservative in his nomenclature as far as auxiliaries are concerned. First of all, he is not very consistent in his choice, he alternates between the terms anomalous verbs and preterite presents (*can, dare, may, must, ought, shall, will*) acknowledging that *need* also fits into that paradigm, having lost its 3.P -s and taking the negation particle *not*.

At another point, he employs the term ‘chief auxiliaries’ referring to the elements *be, have, do, will, shall* and *may*. The latter, he characterises as auxiliary of permissive mood as in ‘*May you be happy!*’. In a preceding section, Sweet (1891, 108) he discusses various instances of periphrastic mood and the corresponding auxiliaries such as *would*, the auxiliary of conditional mood *should*, the auxiliary of compulsive mood *to be+INF* and the auxiliary of permissive mood *may*. As this indicates, Sweet (1891) does not use a terminology that is influenced by modal logic and he is certainly not the one who has inspired Blatz in his nomenclature.

4.3.4 George O. Curme

Another grammarian that undertakes a related approach is the American George O. Curme. Decades after being a visiting scholar in Berlin in 1896, he published his influential *A Grammar of the German Language*. Curme (1922, 317) introduces a class of ‘auxiliaries of mood’ that encompass the six traditional modal verbs: *dürfen, können, mögen, müssen, sollen* and *wollen*. Even if it is homogeneous from a morphological perspective, Curme (1922, 318) is aware that *wollen* is no real preterite present and that there is a further preterite present that is not part of this class *wissen*. As he argues, the latter cannot be considered as a ‘modal auxiliary’ as it does not exhibit the IPP-effect and it fails to embed bare infinitive complements. In its extension, Curme’s class is analogous to the one defined by Vernaleken (1861, 94). Yet, Curme (1922) is inconsistent in his use of the designation: sometimes, he refers to this verb class as past present verbs, sometimes as auxiliaries of mood and sometimes as modal auxiliaries. Apart from that, Curme (1922, 318ff.) delivers a systematic description of each individual verb, which includes discussions of the epistemic uses of *dürfte, können, mögen, müssen* and the reportative use of *wollen* and *sollen*. This characterisation reflects by and large the one that has been undertaken by Becker (1836), except that *lassen* and *brauchen* are not considered.

Curme (1922, 318) does not become very explicit as far as the motivation of his definition is regarded. Considering the extension of his class, it appears that morphological reasons are dominant. This is further reflected by the fact that the modal auxiliaries are discussed in the context of irregular verbs. Yet, Curme seems to assume that the class can be motivated from independent functional or grammatical reasons. This becomes more evident in his English Grammar when Curme (1931, 393) discusses the function of modal auxiliaries in English:

As subjunctive forms lost their endings modal auxiliaries were pressed into service to express the same ideas [...] they ceased to be verbs and are now in reality mere

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grammatical forms to color the statement.

In this statement, the function of modal auxiliaries in English is identified as a means to circumscribe mood. But as English differs from German in that respect, one should avoid premature conclusions about what the functional motivation of Curme's definition of German modal auxiliaries could be.

4.3.5 Braune, Paul and Behaghel: the decline of the semantic motivation

At the same time, a new tradition arises among the positivist Neogrammarians, which focusses on the morphological aspects of the verb under discussion here rather than on functional or grammatical ones. Their particular interest might be due to their explicit historical interest. In his Old High German grammar, Braune (1886, 252, 259) limits himself to the morphological development of the *praeteritopraesentia* and *wollen*, which developed from a former subjunctive of the past form. He does not make any comment about a semantic or functional motivation. This might be partially caused by the circumstance that most of the traditional six modal verbs behaved in a different manner in Old High German. Moreover, historical semantics is always a very speculative endeavour, too speculative for the positivist Neogrammarians.

Some of the subsequently published grammars of New High German follow this tradition such as Wilmanns (1906, 92–99 §51–§55), Sütterlin (1910, 232, 240) and Paul (1917, 262 §190–§195). The three of them adopt the term preterite present and are confined to the morphological anomalies of this class. Apart from that, they discuss the development of the former subjunctive of the past *wollen*.

In a similar manner, Sanders (1908, 222) focusses on the formal peculiarities of these verbs. In contrast to the other grammarians discussed here, he does not consider the traditional modal verbs as a separate class. Rather, he assumes that they constitute a class together with all the verbs that exhibit the IPP in German. According to his perspective all of these verbs should be regarded as auxiliaries: *dürfen*, *heißen*, *helfen*, *hören*, *können*, *lassen*, *lehren*, *lernen*, *machen*, *mögen*, *müssen*, *sehen*, *sollen*, *wollen* and occasionally *brauchen*, *pflügen*, *suchen* and more rare *empfinden*, *erblicken*, *finden*, *fühlen*, *schauen*, *wissen* and *zeigen*. Similar to the other approaches sketched here, he does not provide any functional or grammatical motivation.

Finally, Behaghel (1924, 309) does not pay so much attention to this group of verbs. In a section on auxiliaries, he refers to them as *Hilfsverben*, *die ein Dürfen, Können, Sollen, Wollen bezeichnen* 'auxiliaries that refer to a permission, possibility, obligation or a wish'. Interestingly, his semantic characterisation is neither exhaustive nor consequent. Furthermore, he does not give any motivation for his classification. In a subsequent section, Behaghel (1924, 368) once again employs the term *Hilfsverben* 'auxiliaries' *dürfen*, *können*, *mögen*, *müssen*, *sollen*, *wollen*, when he notes that they all exhibit the IPP-effect. Furthermore, he acknowledges that *brauchen* manifests the IPP-effect as well. However, Behaghel does not become explicit about the nature of this verb. Likewise, the term *Hilfszeitwort* 'auxiliary' is used for these verbs in the *Trübners deutsches Wörterbuch* edited by Götzke and Mitka (1939).

Most of these definitions that evolved in the early 20th century refrain from a grammatical or functional motivation. Either they are solely motivated on morphological grounds or the grammatical motivation remains implicit. There are analogies to the research on modal auxiliaries

in English at that time. Jespersen (1917, 92–96) enumerates the relevant elements yet without labelling them with a specific term. At some later point Jespersen (1917, 94) refers to the pattern *mustn't* as a 'prohibitive auxiliary'.

In the late thirties, the foundations were laid for a grammar, which became the most popular one after the second world war when Basler (1935) edited the first *Duden* grammar. It is basically grounded on Friedrich Bauer's *Grundzüge der neuhochdeutschen Grammatik für höhere Bildungsanstalten* which has been published in 1850. After 17 successful editions in thirty years, it has been revised by Konrad Duden and republished in 1881 as the 18th edition of *Grundzüge der neuhochdeutschen Grammatik für höhere Bildungsanstalten und zur Selbstbelehrung für Gebildete*. As it has already been demonstrated above, Bauer (1850, 30 §66, 102 §166) assumes that there is a class of auxiliaries in German that consists of the six traditional modal verbs. In this respect, Bauer's description has not undergone any substantial change at least until the 12th edition for catholic schools, cf. Bauer (1870, 64 §66, 163 §167). However, in a footnote, he refers to single verbs as *Hilfszeitwörter des Modus* 'auxiliaries of mood', cf. Bauer (1870, 158 §165 Fn.). Likewise, the subsequent version edited by Bauer and Duden (1887, 69 §66) adopts in essence the descriptions given in earlier editions. There are only minor revisions concerning the terminology. In the section on morphology, these verbs are called *unregelmäßige Verba* 'irregular verbs' rather than *abweichende Verben* as in the earlier editions. Furthermore, Bauer and Duden (1887, 69 Fn.1) notice in a small footnote that these verbs plus the verb *wissen* constitute a class that is called *Praeterito Praesentia* and that essentially exhibits the IPP.

In his terminology, Basler (1935, 89) avoids Latin expressions and accordingly he chooses a denomination that is purely German *Hilfszeitwörter der Redeweise*. In contrast, to the original predecessor Bauer (1850, 102 §166), he suggests a class extension which contains the six traditional modal verbs including *lassen*: *können*, *mögen*, *wollen*, *dürfen*, *sollen*, *müssen* and *lassen*. A considerable criterion for the classification undertaken by Basler (1935, 94) seems to be the availability of the IPP-effect. Yet, he acknowledges that there are two more verbs that are attested with this pattern: *heißen* and *sehen*. Moreover, he remarks that *hören*, *helfen* and *lernen* are also found with IPP-morphology, yet, in this cases, this is result of a misunderstood assimilation ('*In falsch verstandener Angleichung*'). Basler (1935) has obviously adopted this assessment from Bauer and Duden (1887, 69 Fn. 1) who provide an almost identical formulation. However, their evaluation deserves attention as it is in conflict with the evidence provided by Kurrelmeyer (1910) who has demonstrated that precisely *hören* was one of the first verbs that exhibited the IPP in late Middle High German. Moreover, Basler (1935, 111) argues that they are preterite presents except for *lassen*.

As it has been demonstrated, Neogrammarians return to a consistent definition. This is due to their particular interest of phenomena that can be clearly observed. Accordingly, their classification is based on mere morphological grounds. The function of the respective verbs is largely ignored in this point. This is also reflected by the term that is employed in these grammars. The expression *praeteritopraesentia* gives insights about the morphological development of these verbs but not so much about their function or role in grammar. Such a perspective has been adopted by several of the major grammarians in the early 20th century. Other authors, remain very superficial and intuitive as far as the grammatical motivation of their definition is concerned. Terms that contain a reference to mood or modality become rare again.

4.3.6 Gunnar Bech (1949)

It is a term-paper that Gunnar Bech wrote when he was a student that became later on the maybe most influential contribution to the contemporary reasoning on modal verbs in German after it has been published in 1949.⁴¹⁹ The study entitled *Das semantische System der deutschen Modalverben* ‘The semantic system of the German modal verbs’ is frequently cited for a couple of achievements. Firstly, Bech (1949) has reintroduced the term *Modalverb* and second he pleads for a class of modal verbs that comprises the six verbs *wollen*, *sollen*, *dürfen*, *mögen*, *müssen* and *können*. He is the first one who combined the particular term with the six modal verbs. As the title already indicates, Bech’s main interest is the semantics of these six verbs. Although they exhibit an analogous morphology, this circumstance does not receive much attention in his study. His major objective is to argue that these six verbs together constitute a ‘semantic system’. In these respects, he can be regarded as the father of the traditional six modal verbs in German.

As with many studies on grammar in earlier times, Bech (1949) has not documented his references to other studies. Correspondingly, it remains fairly speculative which parts of his investigations are of his own achievement and which adoptions from other surveys. Yet, it is not very likely that he, being still a student, reinvented the wheel in every detail. Moreover, he was supervised in Copenhagen by a couple of influential scholars, such as the structuralist Louis Hjelmslev, and it is not clear as to which extent this term-paper reflects the perspectives of his teachers. Finally, there are four striking parallels to various preceding studies most notably to the ones that have been carried out by Becker (1836), by Schoetensack (1856), by Vernaleken (1861, 94) and by Blatz (1900).

As far as the name of the term is concerned, there are not too many influences that come into consideration. Prior to Bech’s work, only a few more investigations can be found that have used the precise term *Modalverb*: the grammar written by Blatz (1896) and Rossmann (1908). Similar terms such as ‘modal auxiliaries’ or ‘auxiliary of mood’ are employed by Curme (1922, 318), Curme (1931) and Kirchner (1940). It is fairly likely that Bech had knowledge about Curme’s grammars, as he explicitly quotes them in a subsequent study, cf. Bech (1963, 292). Yet, it remains mysterious as to what precisely caused him to adopt this term that has previously not been used very frequently.

Moreover, there are similarities with respect to the extension of the suggested class. As it has been illustrated above, classes that encompasses the six members are not very frequent. Previous authors that have suggested such an extension are Bauer (1850, 102 §166), Vernaleken (1861, 94) and Curme (1922, 371).

Apart from that, the extensive case studies presented in Bech (1949) are strikingly reminiscent of the descriptions undertaken by Becker (1836) and Schoetensack (1856). This concerns for instance the analysis of *sollen* as a verb of external volition.

Finally, the way Bech (1949) motivates his definition is by and large analogous to the one elaborated by Becker (1836, §90–§93). The latter argues that all of the eight verbs he has considered express either a necessity or a possibility, including the volitional verb *wollen*, which he analyses as a verb that expresses an inner necessity. In contrast to Becker, Bech (1949) only considers six verbs as relevant for his definition, leaving aside *lassen* and *brauchen*. Moreover,

⁴¹⁹ A short biography of Gunnar Bech is provided as a preface of the reprint of Bech’s (1955/57) *Studien über das deutsche Verbum infinitum* published by Niemeyer in Tübingen in 1983.

Bech (1949, 38) arranges them in a structuralist feature matrix consisting of a couple of feature oppositions such as ‘necessity/possibility’ and ‘subject referent is identical/not identical to the modal source’. This matrix should justify the existence of this modal verb class consisting of its six members. In essence, Bech’s analysis is Becker’s description in a structuralist guise. Furthermore, Bech (1949) managed to establish a concept that seemed both plausible and simpler than most of those that were preceding – even if it might suffer from essential contradictions and inconsistencies. Yet, it remains mysterious as to what exactly made him adopt the rare term *Modalverb* and what caused him to abandon the verbs *brauchen* and *lassen* which have originally been considered as auxiliaries of mood.

In his *Kurze deutsche Syntax*, Dal (1952, 107) does not provide an extensive discussion on modal verbs. He contents himself to mention that there are six *modale Hilfsverben* that precisely correspond to the selection undertaken by Bech (1949). In a subsequent section, Dal (1952, 145) briefly remarks that these verbs can be used to circumscribe subjunctive of the past.

Much in the spirit of Bech (1949), Welke (1965) advocates a class of ‘*Modalverben*’ that comprises the same six verbs as Bech suggested. In contrast, Welke (1965, 11) provides a classification in terms of syntactic characteristics. According to his view, the traditional six modal verbs are those verbs that (i) obligatorily select bare infinitive complements, (ii) that require subjects of the infinitive that are co-referent with the matrix subject and (iii) that exhibit no semantic restriction with respect to their infinitive complement. As he argues, this characterisation yields exactly the traditional six modal verbs. In a brief remark, he acknowledges that this definition would also include *tun* and *werden*. Finally, Welke (1965, 12) concedes that any syntactic classification comprising the traditional six modal cannot be achieved without making arbitrary decisions. However, Welke’s investigation happened to support and strengthen Bech’s analysis in the end.

4.3.7 The *Duden* grammar

For some mysterious reason, German grammars that have been published after the second world war seem to suffer from amnesia. The most popular ones edited by Grebe (1959, 83) and by Griesbach and Schulz (1960) adopt the term modal verb and assume that this class only encompasses six items. In opposition to its immediate predecessor Basler (1935, 89), Grebe (1959, 83) does not consider *lassen* as a modal verb anymore. As none of these grammars makes an explicit reference in the respective sections, one can only speculate about possible influences. Yet, the precise choice of the terms and the class extension could be very revealing. In previous studies, the term and the class extension have not been used very frequently. As Bech (1949, 1951) was the first who combined both of them, it seems to be fairly likely that he is the major reference for the two grammars. For later grammars, the first comprehensive monograph on modal verbs published by Welke (1965) becomes another influential point of reference.

In the first edition of the *Duden* grammar edited by Grebe (1959, 83), the denomination of the verb class is not yet consistent. In an earlier section on auxiliaries, they are referred to as *modifizierende Verben* ‘modifying verbs’. Later, in the major section dedicated to these verbs they are introduced as *Modalverben* which comprise the traditional six verbs, cf. Grebe (1959, 485). Finally, Grebe (1959, 486) remarks that *brauchen* can be used in a similar fashion. The entire treatment of the modal verbs does not exceed a couple of small paragraphs in this first

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edition.

In the second edition of the *Duden* grammar edited by Grebe et al. (1966, 528), the sections on modal verbs have not undergone any substantial changes except for the observation that *brauchen* exhibits the IPP-effect when used with a infinitive complement, cf. Grebe et al. (1966, 131) referring to Kolb (1964).

In opposition to that, the third edition of the *Duden* grammar edited by Grebe et al. (1973, 66) contributes a comprehensive section on modal verbs, in which the term *Modalverben* is consequently used. Once again, it is assumed that the class comprises the traditional six members. Following the spirit of Welke (1965), a couple of characteristics are given in which the modal verbs are claimed to differ from all of the remaining verbs: (i) they select bare infinitive complements, (ii) they are preterite presents, (iii) they exhibit IPP, (iv) they can select the infinitive of the perfect and (v) they convey an additional meaning. Yet, the authors concede that a clear-cut delimitation is not possible. Finally, Grebe et al. (1973, 72) makes mention of the epistemic modal interpretation for the first time.

In a similar manner, the fourth edition edited by Drosdowski et al. (1984, 94–105) has undergone a considerable revision. The section dedicated to the modal verbs has been extended from a couple of paragraphs in the first two editions to 12 pages in the fourth edition. Hermann Gelhaus, the author of that section, reveals all of his sources encompassing the work of Bech (1949), Kolb (1964), Welke (1965), Fourquet (1970) and other research literature from that period. Drosdowski et al. (1984, 94) characterise modal verbs as verbs that modify the content of another verb. Moreover, it is argued that (i) they select bare infinitive complements, (ii) they cannot occur as imperatives and (iii) they resist passivisation. Apart from the traditional six modal verbs, *brauchen* receives attention as well. It is considered as a close relative of the modal verbs. Finally, Drosdowski et al. (1984, 112) notice that *lassen + sich* is a pattern that concurs with the modal verbs.

In the fifth edition edited by Drosdowski et al. (1995, 92–104), there is once again a proper section on a class of modal verbs, which encompasses the traditional six members. The content has not undergone any substantial changes with respect to the preceding edition.

Once again, the seventh edition edited by Eisenberg et al. (2005, 562) was subject to a comprehensive revision. The main article has been written by Cathrine Fabricius-Hansen who makes explicit reference to Bech (1949), Kratzer (1981), Brünner and Redder (1983) and Zifonun (1997). In contrast to the previous edition, the content has been reduced and is presented in a more condensed form. Whereas the designation of the class has remained the same, there are some minor changes in the extension. At the out set, the traditional six modal verbs are only mentioned. However, in the subsequent lines *brauchen* is explicitly considered as a modal verb. Moreover, Eisenberg et al. (2005, 566) notice that *möchte* can be regarded as an independent item as it occasionally with a proper infinitive. Eisenberg et al. (2005, 563) provide a description that has a semantic focus. As the authors conclude, modal verbs are characterised by three essential modal dimension: modal force, modal base and the modal source.

In contrast, the grammar edited by Griesbach and Schulz (1960, 41, 65) is grounded on different assumptions. According to their perspective, the class of modal verbs is characterised by the selection of bare infinitives and availability of two modal interpretation: modal and epistemic. Thus, Griesbach and Schulz (1960, 41, 65) provide a definition that is functionally motivated. It is the first grammar that stresses the singularity of the epistemic modal interpretations. Yet, they

conclude that the class only encompasses the six traditional members.

As this section has revealed, the two popular grammars edited by *Duden* and Griesbach and Schulz (1960) have employed the term *Modalverb* since the early sixties. As they have used it throughout the present, it is fairly likely that they have played an important role in the proliferation of this expression that was almost not in use before Bech's (1949) monograph had been published. In a similar fashion, Redder (1984, 306) has shown that the grammars which have been published after the second world war differed with respect to the term they employed: *Modalverb* or *modales Hilfsverb*. The former term could only prevail in the seventies.

4.3.8 Summary

As the preceding section have demonstrated, the German concept *Modalverb* suffers from an essential inconsistency. According to the perspective taken by most of the contemporary authors, the class should be motivated by two different types of criteria: by morphological criteria and by functional or grammatical criteria. However, the set of verbs that exhibit the morphology typical to modal verbs is not congruent with the set that displays modal semantics.

It has already been observed in the 16th century that some of the verbs which are known today as modal verbs behave in an awkward manner. In turn, it has frequently been suggested that they form a class that has to be treated apart from the other verbs. Yet, the precise term and the extent of this class differs from author to author across the centuries, as is illustrated in Figure 4.2.

Being more salient, it was initially the morphological anomalies that attracted the attention of the grammarians. In the descriptions that have been published prior to those provided by Becker (1836, 174–186), the definitions have been motivated based on morphological features. Bödiker (1698, 109) was the first one who argued that the all six preterite present verbs plus the former subjunctive of the past *wollen* should be considered as auxiliaries, which is evidently grounded on the circumstance that all of these verbs can take infinitive complements. Yet, an explicit functional or grammatical motivation is missing for this classification.

It was only more than hundred years later, when Becker (1836, 176) explicitly provided such a motivation. As he argues, these verbs are particular in that they express either a possibility or a necessity. Accordingly, they should be considered as auxiliaries of mood. In his characterisation, the morphological aspect becomes less crucial, although Becker (1836, 176) stresses that these verbs are characterised by a morphological anomaly. As class definition is above all motivated in a functional manner, he finishes by widening his scope and integrates two verbs into his class that behave analogously in semantic respect: *lassen* and *brauchen*. This line of reasoning has been adopted by a lot of grammarians in the 19th century. Yet, most of them have tacitly excluded *brauchen*. However, their approach results in a class that is inconsistent in both respect: morphological and functional. Finally, Blatz (1896, 538) has introduced the term *Modalverba* for reasons that remain mysterious.

In the late 19th century, authors working in the tradition of the Neogrammarians, such as Braune (1886, 252), returned to a merely morphological coined definition. Accordingly, they dropped the functionally motivated designation 'modal auxiliary' and replaced it by a term that is solely based on morphological grounds: 'praeterito praesentium'.

In the late forties, Bech (1949) once again came up with a definition that is above all functionally motivated. As his class only encompasses the traditional six modal verbs, other verbs

author	term	<i>thuerrren</i>	<i>taugen</i>	<i>wissen</i>	<i>müssen</i>	<i>können</i>	<i>sollen</i>	<i>mögen</i>	<i>dürfen</i>	<i>wollen</i>	<i>lassen</i>	<i>brauchen</i>
Ölinger (1574)	(IPP)					x	x	x	x	x		
Claius (1578)	verba monosyllaba	x	x	x	x	x	x	x	x	x		
Schottel (1663)	(IPP)			(x)	x	x	x	x	x	x		
Schottel (1698)	gleichsam auxiliara				x	x	x	x	x	x		
Adelung (1782)	unvollständige prädicatē				x	x	x	x	x	x		
Grimm (1822)	verba zweiter anomalie	x		x	x	x	x	x				
Heyse (1822)	verba zweiter anomalie				x	x	x	x	x	x	x	
Bauer H. (1832)	Huelfsverben des Modus				x	x	x	x	x	x	x	
Becker (1836)	Huelfsverben des Modus				x	x	x	x	x	x	x	x
Bauer F. (1850)	Hilfszeitwörter				x	x	x	x	x	x		
Bauer F./Duden (1887)	Hilfszeitwörter				x	x	x	x	x	x		
Schoetensack (1856)	modale Huelfsverben			x	x	x	x	x	x	x	x	
Vernaleken (1861)	verba zweiter anomalie				x	x	x	x	x	x		
Blatz (1896)	Modalverba				x	x	x	x	x	x	x	x
*Braune (1886)	praeteritopraesentia	x	x	x	x	x	x	x	x			
Wilmanns (1906)	Präterito Präsentien	x	x	x	x	x	x	x	x			
Sanders (1908)	among Hilfsverben with IPP			(x)	x	x	x	x	x	x	x	(x)
Sütterlin (1910)	Präterito Präsentien		x	x	x	x	x	x	x			
Paul (1917)	Präterito Präsentien	x	x	x	x	x	x	x	x			
Curme (1922)	auxiliaries of mood, modal auxiliaries				x	x	x	x	x	x		
*Behaghel (1924)	Hilfsverben				x	x	x	x	x	x		
Basler (1935)	Hilfszeitwort				x	x	x	x	x	x	x	
Bech (1949)	Modalverben				x	x	x	x	x	x		
Dal (1951)	modale Hilfsverben				x	x	x	x	x	x		
Duden (1959)	Modalverben				x	x	x	x	x	x		
Griesbach/Schulz (1960)	Modalverben				x	x	x	x	x	x		
Welke (1965)	Modalverben				x	x	x	x	x	x		
Duden (1966)	Modalverben				x	x	x	x	x	x		
Duden (1973)	Modalverben				x	x	x	x	x	x		
Duden (1984)	Modalverben				x	x	x	x	x	x		
Duden (1995)	Modalverben				x	x	x	x	x	x		
Duden (1998)	Modalverben				x	x	x	x	x	x		
Duden (2005)	Modalverben				x	x	x	x	x	x		x

Figure 4.2: Different extension of the term *Modalverb* across the centuries

with an analogous interpretation such as *brauchen* or *lassen* are ignored. Thus, from a strict functional perspective, the choice taken by Bech (1949) is not plausible. Furthermore, he is the one who has re-introduced the term *Modalverb* which was not much in use before and already forgotten. As it appears, it is mainly due to the popular *Duden* grammars and the ones published by Griesbach and Schulz (1960, 65) that the term *Modalverb* in combination with the traditional six members could proliferate in the second half of the 20th century.

As Bech (1949) is reluctant to reveal his references, it will remain subject to further speculations as to which authors were his major influences. Yet, it is an established fact that the term *Modalverb* has hardly been employed before him, except for Blatz (1896, 538) and Rossmann (1908). Moreover, the number of authors who suggested that class encompasses precisely the traditional six verbs is fairly limited: before Bech, this extent was only promoted by few prominent authors, such as Bauer (1850, 102), Vernaleken (1861, 94) and Curme (1922, 317). In most descriptions until the thirties, *lassen* used to be considered as a modal auxiliary as well.

With the functionally motivated definition elaborated by Griesbach and Schulz (1960, 65), the availability of an epistemic interpretation became relevant as an essential characteristic of the modal verbs. In the subsequent period, the attention has shifted to other verbs that exhibit an epistemic interpretation as well such as *werden* which has been analysed as a modal verb by Welke (1965, 12) and Vater (1975, 110). The importance of this feature further increased until it became the core of the definition, such as in the accounts based on poly-functionality advocated by Öhlschläger (1989, 132), Engel (1996, 463), Diewald (1999, 1) and Reis (2001, 287). As this definition is rather functionally motivated than morphologically motivated, some of the authors adapt the extent of the class. As *werden* and *brauchen* exhibit an epistemic interpretation as well, Engel (1996, 463) and Reis (2001, 287) integrate these verbs in their respective classes of modal verbs.

With the increasing attention, which has been paid to the modal verbs in the seventies and eighties, other items came into consideration that have not been part of the traditional class of modal verbs. Kolb (1964), Folsom (1968) and Scaffidi-Abbate (1973) have illustrated that *brauchen* behaves like a modal verb in almost all of the essential aspects. Likewise, Öhlschläger (1989, 7) and Wurmbrand (2001, 137, 183, 224) demonstrate that *möchte* cannot be interpreted as subjunctive of the past of *mögen* but it has to be treated as an independent lexical item. In the same spirit, Wurmbrand (2001, 137, 224) suggests that *dürfte* is a verb on its own.

In the Section 4.2.13, it has turned out that it appears impossible to establish a homogeneous class of modal verbs in German. In turn, the question arose as to which extent these inconsistencies are due to the term and the concept *Modalverb*. After having reviewed their origin and development, it was seen that the history of the term and the concept *Modalverb* is dominated by the conflict between a morphologically motivated definition and a functionally motivated definition. Starting with Becker (1836), most authors try to provide a definition that is motivated in double manner: morphological and functional. Yet, such an approach does not succeed as the class of verbs with the morphological anomaly is not congruent with the class of verbs that exhibit a functional peculiarity. Interestingly, most authors that pursue a double motivation for the class of modal verbs in German avoid to become too explicit about the justification in more detail. Thus, they fail to prove that each of the suggested verbs fulfils indeed both morphological and functional criteria. Any of the accounts above can be characterised either as a (rather) morphologically motivated one or as a (rather) functionally motivated one.

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From this follows; there are only two consistent ways of unifying the German verbs under consideration. Firstly, it is possible to provide a definition that is merely grounded on morphological aspects. Such a classification will result in a class equivalent to the preterite presents described by the Neogrammarian authors such as Braune (1886, 252). Alternatively, one could elaborate a definition that only takes into consideration functional or grammatical aspects. Yet, as functional properties are often not too salient and their classification is often subject to a lively debate, the second approach faces more challenges. As it has been revealed in Section 4.2.13, there is at least one functional criterion that has turned out to be a fairly salient characteristic: the availability of an epistemic interpretation. Accordingly, the most fruitful solution appears to be to restrict the attention to the epistemic interpretations of all the verbs considered here. As the resulting group is homogeneous in semantic respect, they could be regarded as a semantic or functional class. Even if the associated members do not constitute a morphological class, there are other formal properties they have in common: all of the epistemic modal verbs select bare infinitive complements and all of them are raising verbs.

In opposition to the modal auxiliaries in English, a definition that is motivated both by morphological and functional aspects will not result in a consistent class in German. Accordingly, it appears to be more appropriate to content ourselves with a class definition that is limited to the epistemic interpretations. At the same time, advocates of the more traditional definitions of modal verbs are confronted with the question of what benefit they would gain in cleaving to a class that is maybe elegant but not consistent and homogeneous.

Yet, this does not mean that the anomalous morphology and the peculiar function do not have any impact on each other. As far as grammaticalisation is concerned, it is certain that anomalous forms are more likely to grammaticalise than regular ones. A similar observation has been made by Grimm (1822, 851), who has noticed that verb forms that are frequent or that exhibit an anomalous morphology act often as auxiliaries.

Even if it is not possible, to constitute a class of modal verbs in German, one can compare the kinship of the verbs considered here. As it has turned out, these verbs exhibit a couple of properties that are very rare or do not appear very frequently. For instance, a genuine epistemic interpretation is only attested with the verbs discussed here. Likewise, there are only the six traditional modal verbs, *brauchen* and *lassen* which exhibit an obligatory IPP-effect, as it has been illustrated in Section 4.1.1. Furthermore, the number that involve a preterite present or related morphology is fairly limited. This affects particularly the two first criteria: the 3rd person singular indicative without suffix and the vowel alternation between the singular present indicative forms and their plural counterparts. In opposition, the vowel alternation between the infinitive and the past tense stem is a characteristic that affects most of the irregular verbs, as well. In more detail, Eisenberg et al. (2005, 491–502) enlists more than 190 irregular verbs that display a vowel alternation between the present stem and the past stem. Apart from the verbs considered here, there are only a couple of subject-to-subject raising verbs in German such as *scheinen*, *drohen*, *versprechen*, *pflügen*. In a similar vein, the number of subject-to-object raising verbs is fairly limited *sehen*, *hören*, *fühlen*, *haben*, ... As it has been indicated in Section 4.1.2 example (18), there are only about ten more verbs in German that select bare infinitive complements besides the potential modal verbs. Moreover, the number of predicates that select verbless directive phrases apart from the verbs investigated here does not exceed ten, as it has been indicated in Section 4.2.1.

Thus, there are at least eight properties that cluster among the potential modal verbs and that do not frequently occur with other verbs. These features could be helpful to determine the degree of kinship between the verbs enlisted in Figure 4.3. Now, we could assume that features that are only attested with the potential modal verbs are more crucial for a definition. The column entitled relevance displays the number of verbs that exhibit the property apart from the verbs in consideration. Likewise, features that do only occur with one or a few of the potential modal verbs would weigh less.

From a contemporary perspective, it might appear awkward that *lassen* was considered as modal auxiliary across centuries. Yet, it is more related to the traditional six modal verbs that it seems at first glance. As it has been demonstrated by Reis (2001, 308) *lassen* exhibits an epistemic interpretation under certain conditions. Obviously, this use is restricted to environments in which *lassen* is part of a directive speech act.

- (491) A: Was kostet das Buch wohl?
 what costs the book maybe
- (492) B: Lass es mal 100,- kosten.
 let-IMP it PART 100 cost-INF
 A: 'How much could the book be?'
 B: 'Let it be 100,- /Assume that it costs 100,-.'

In the example given by Reis (2001), the epistemic use of *lassen* embeds a stative predicate, which is reminiscent of the other epistemic modal verbs considered in the previous section. Moreover, the speaker expects that the embedded proposition is not part of the deictic centre's knowledge. In these respect, *lassen* behaves just as canonical epistemic modal verbs do. Interestingly the deictic centre is not identical to the speaker here. Rather, it is linked to the addressee referent which is grammatically encoded as the subject argument of *lassen*. A similar context shift is attested with the reportative modal verbs *wollen* and *sollen*.

Finally, it merits closer attention that *lassen* occurs more often than usual lexical main verbs and exhibits a frequency similar to other traditional modal verbs such as *können*, *müssen* or *wollen*, as it has been exhibited in Section 4.1.4. At this point, the striking analogies between *lassen* and the traditional six modal verbs cannot be denied anymore.

Even if such an approach would enable us to determine the degree of kinship between the potential modal verbs, it will hardly ever result in a clear cut class of modal verbs. Accordingly, it is favourable to refrain from the traditional concept of modal verbs.

In this section, it has been shown that the traditional class of modal verbs is by far less natural than it appears. Moreover, this concept suffered from an essential conflict since it has been introduced. It was claimed that it is motivated by morphological characteristics and functional characteristics. Yet, there has always been a discrepancy between these two classes of criteria. A definition that is based on the morphological anomaly will result in another class extension that a definition would do that is grounded on functional aspects.

Furthermore, it has been illustrated that throughout the centuries there have been different terms and different extensions. Therefore, it should not be too surprising if the term *Modalverb* in combination with the six to eight verbs investigated here was not the last word in this story.

relevance	222 criterion	<i>wissen</i>	<i>müssen</i>	<i>können</i>	<i>mögen</i>	<i>sollen</i>	<i>wollen</i>	<i>dürfen</i>	<i>lassen</i>	<i>brauchen</i>	<i>möchte</i>	<i>dürfte</i>	<i>werden</i>
0	epistemic reading (F)		x	x	x	x	?		(x)	x		x	x
0	obligatory IPP (M)		x	x	x	x	x	x	x	x			
0	3.p.sg without suffix (M)	x	x	x	x	x	x	x		(x)			
0	vowel alternation sing./ plur. (M)	x	x	x	x		x	x					
<10	subj-to-subj raising (S)		x	x	x	x	x	x		x	x	x	x
<10	subj-to-obj raising (S)								x				
10	bare infinitives (S)		x	x	x	x	x	x	x	x	x	x	x
10	verbless directional phrases (S)		x	x	x	x	x	x	x	x	x		
?20	expression of possibility/necessity (F)		x	x	x	x	x	x	x	x	x	x	
>190	vowel alternation infinitive/past (M)	x	x	x	x			x					

4 Is there a class of modal verbs in German?

5 The nature of epistemic modality

As the last Section has revealed, the most peculiar property associated with the so-called modal verbs is their ability to encode an epistemic modality. In this section, the two essential characteristics will be explored: (i) the ability of epistemic modal verbs to embed predications between an identified subject referent and a predicate that refers to a state that cannot be changed or a predicate that refers to an event in the past and (ii) the condition that the embedded proposition must not be part of the speaker's knowledge. In order to determine the precise nature of epistemic modal verbs, they will be compared to their circumstantial counterparts. The leading question can be phrased as: Why can epistemic modal verbs embed such types of predications? And why do circumstantial modal verbs fail?

As it will be shown, circumstantial modal operators are event modifiers which are restricted to the modifications of predicates that can be interpreted as an event. In opposition, epistemic modifiers are not subject to this requirement as they are modifiers of propositions or speech events. An analogous contrast can be observed with other modifiers as well which are ambiguous between an epistemic and a non-epistemic version such as reportative modal verbs, causal clauses, conditionals, manner adverbs, locative adverbials. Finally, the investigation will be extended to related modifiers which are ambiguous between similar types of event related interpretations and clause related interpretations, such as concessive clauses, purpose clauses and temporal clauses.

5.1 Types of modification

As has been demonstrated in Sections 4.2.1-4.2.12, epistemic modal verbs are characterised by the ability to embed predications between an identified individual and a predicate that refers to a state that cannot be changed or a predicate that refers to an event in the past. It has been illustrated that a circumstantial interpretation is ruled out under such conditions. A similar observation has already been made by Abraham (1991, 2001, 2005) and Leiss (2002) for German and by Barbiers (2002, 59, 61) for Dutch.

All of the verb forms that involve an epistemic interpretation are attested in configurations in which they select stative predicates that refer to states that cannot be changed and in configurations in which they select a predicate that refers to an event in the past: *kann* (1)–(2), *könnte* (3)–(4), *muss* (5)–(6), *müsste* (7), *will* (8), *dürfte* (9)–(10), *sollte* (11), *mag* (12)–(13), *braucht nicht* (14)–(15) and *wird* (16)–(17):

- (1) Es kann sein, dass mich die neue Frisur ein wenig schneller und besser gemacht hat¹
it can be that me the new haircut a little faster and better made has
'It is possible that my new haircut enabled me to be faster and better.'

¹DeReKo: HAZ09/DEZ.03174 Hannoversche Allgemeine, 21.12. 2009.

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- (2) So kann die Motte in Wipshausen einmal ausgesehen haben.²
so can the Motte in Wipshausen once out.look-INF have-INF
'The Motte in Wipshausen could have looked like this once upon the time.'
- (3) Nach Zeugenangaben könnte ein etwa 30 Jahre alter Mann der Täter sein.³
after witness.reports can-SBJV.PST a about 30 year old man the culprit be-INF
'According to the reports of a witness, the culprit could be a man that is about 30 years old.'
- (4) Das Mädchen hatte im Garten gespielt und plötzlich Blut gespuckt. Die Angst der Mutter: Das Kleinkind könnte Glas verschluckt haben.⁴
the-GEN mother the toddler can-SBJV.PST glass swallow-PPP have-INF
'The girl was playing in the garden and suddenly she started spewing blood. The mother was afraid the toddler could have swallowed glass.'
- (5) Schreckliche Angst muss der kleine Junge gehabt haben, der am Samstag in ein tiefes Loch gefallen ist.⁵
terrible fear must the small boy have-PPP INF that at Saturday in a deep hole fall-PPP is
'The boy must have been terribly frightened when he fell into the deep hole on Saturday.'
- (6) Er muss der Täter sein, denn sein Sperma lässt sich in ihrem Unterleib nachweisen.⁶
he must the culprit be-INF as his sperm lets REFL in her abdomen prove-INF
'He must be the culprit because his sperm could be found in her abdomen.'
- (7) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich um einen Mann gehandelt haben müsste.⁷
the clothes indicate then also to.it at that it REFL about a man deal-PPP have-INF must-SBJV.PST
'The clothes indicate that it must have obviously been a man.'
- (8) Der etwa 69 800 Mark teure Cross Country [...] will zwar kein Geländewagen sein, doch in seiner Nähe sehen ihn die Volvo-Leute schon.⁸
the about Mark expensive cross country wants although no all-terrain.vehicle be but in his closeness see him the Volvo-people yet
'Though the Cross Country, which costs 69 800 Mark, might not be an all terrain vehicle, it is considered by the Volvo people as something comparable.'

²DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11.08. 2009.

³DeReKo: RHZ08/JUN.01622 Rhein-Zeitung, 03.06. 2008.

⁴DeReKo: BRZ09/AUG.03524 Braunschweiger Zeitung, 08.08. 2009.

⁵DeReKo: BRZ09/JUL.16635 Braunschweiger Zeitung, 06.07. 2009.

⁶DeReKo: NUZ09/JUN.00298 Nürnberger Zeitung, 04.06. 2009.

⁷DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29.06. 2009.

⁸DeReKo: M97/712.03322 Mannheimer Morgen, 10.12. 1997.

- (9) Das erste Bild des Babys dürfte Schätzungen von Paparazzi
 the first picture the-GEN Baby-GEN might estimations by paparazzi
 zufolge rund fünf Millionen Dollar (vier Millionen Euro) wert sein.⁹
 according.to about five millions dollar (four million Euro) worth be-INF
 ‘According to estimations by paparazzis, the first picture might have a value of about five million Dollars (four Million Euros).’
- (10) Der Mann dürfte im Schlaf gestorben sein, da die Beamten ihn im Bett
 the man might in.the sleep die-PPP be-INF as the officers him in.the bed
 gefunden hatten.¹⁰
 found had
 ‘The man may have died while sleeping, as the officers found him in his bed.’
- (11) Selbstbewusstsein sollte eigentlich auch bei der SG Unnertal in Massen
 self.confidence shall-SBJ.PST actually also by the SG Unnertal in masses
 vorhanden sein.¹¹
 present be-INF
 ‘SG Unnertal should actually have plenty of self confidence.’
- (12) Mit 8 Milliarden Euro Kosten mag Nabucco teuer sein – sie wird sich
 with 8 billion Euro costs may Nabucco expensive be she will REFL
 bezahlt machen.¹²
 pay-PPP make-INF
 ‘With its costs of around 8 billion Euros, Nabucco may be expensive – nevertheless, it will pay off.’
- (13) Feminismus mag in der modernen Gesellschaft wirklich etwas Wichtiges
 Feminismus may in the modern society indeed something important
 bewirkt haben, aber braucht man diese Bewegung auch in der Kirche?¹³
 cause-PPP have-INF but needs one this movement also in the church?
 ‘Even if Feminism may have caused important changes in modern society, is it a necessary movement also in the church?’
- (14) Der „Outer“, wie man klar erblickt, ist nunmehr regelrecht verrückt. Denn was
 the outer as one clearly sees is now downright crazy as what
 er sagt, gesteht er ein, braucht überhaupt nicht wahr zu sein¹⁴
 he says confesses he in need at.all NEG true to be-INF
 ‘The outer has become downright crazy, as one can clearly see. As what he says doesn’t need to be true at all anymore, as he confesses.’

⁹DeReKo: NUZ06/MAI.02995 Nürnberger Zeitung, 29.05. 2006.

¹⁰DeReKo: BVZ09/OKT.01155 Burgenländische Volkszeitung, 14.10. 2009.

¹¹DeReKo: RHZ99/AUG. 20012 Rhein-Zeitung, 28.08. 1999.

¹²DeReKo: NON09/JUL.05420 Niederösterreichische Nachrichten, 13.07. 2009.

¹³DeReKo: RHZ09/MAI.08761 Rhein-Zeitung, 11.05. 2009.

¹⁴DeReKo:O95/SEP.86494 Neue Kronen-Zeitung, In den Wind gereimt, 02.09. 1995

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- (15) Wir haben die Telekom längst gebeten, vor Ort nachzusehen. Das braucht
We have the Telekom long.ago asked at place after.to.look-INF this need
Herr Kunz gar nicht gemerkt zu haben, weil der Techniker dafür
Mister Kunz INTN NEG notice-PPP to have-INF because the technician therefore
nicht unbedingt ins Haus muss¹⁵
NEG necessarily into.the house must
'We already asked the Telekom company to check his connection long ago. Mister Kunz does not have to have necessarily noticed it because the technician does not need to enter the house to do so.'
- (16) Der Leser wird wohl den wackeren Komponisten Gluck kennen,
the reader will probably the brave composer Gluck know-INF,
vorname Christoph Willibald, einen Oberpfälzer.¹⁶
with.first.name Christoph Willibald a upper.Palatinate
'The reader will probably know the composer Gluck whose first name is Christoph Willibald, from Upper Palatinate.'
- (17) Es wird schon einen Grund gehabt haben, warum die Eisbärin ihre Jungen
it will already a reason have-PPP have why the ice.bear.lady her offspring
gefressen hat.¹⁷
eaten has
'There will be a reason why the female ice bear has eaten her offspring.'

As Section 4.2.6 has provided evidence that epistemic modality differs substantially from reportative modality, the reportative interpretations have not been included above. Yet, it has turned out that they behave in an analogous manner. Whenever *wollen* and *sollen* select stative predicates that refer to states that cannot be changed or predicates that refer to an event in the past, only a reportative interpretation is possible, any volitional or circumstantial reading is blocked.

- (18) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die hagere
Badhapur is a Sadhu, a sage righteous 106 years wants the rawboned
Gestalt mit dem langen grauen Haar schon alt sein.¹⁸
figure with the long grey hair already old be-INF
'Badhapur is a Sadhu, a wise and righteous man. This rawboned figure with long grey hair claims to be 106 years old already.'
- (19) Sieben Packerl Rotwein will er vor dem Prozess konsumiert haben.¹⁹
seven packets red.wine wants he before the process consume-PPP have-INF
'He claims to have consumed seven packets of red wine prior to the process.'

¹⁵DeReKo:NUN06/NOV.02580 Nürnberger Nachrichten, 23.11. 2006.

¹⁶DeReKo: O98/AUG.75935 Neue Kronen-Zeitung, 04.08. 1998.

¹⁷DeReKo:NUN08/JAN.00722 Nürnberger Nachrichten, 08.01. 2008.

¹⁸DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23.10. 1999.

¹⁹DeReKo: NON09/JUL.08001 Niederösterreichische Nachrichten, 15.07. 2009.

- (20) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl. F.) soll Tom Cruise and Katie Holmes are shocked L R Hubbard (small picture) shall Suris Vater sein.²⁰
Suri-GEN father be-INF
'Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri's father.'
- (21) Horst Seehofers Ex-Geliebte Anette Fröhlich (35) soll den CSU-Chef Horst Seehofer-GEN ex-lover Anette Fröhlich (35) shall the CSU-head laut „Bunte“ zuletzt in Berlin „regelmäßig und lange“ besucht haben.²¹
according.to Bunte recently in Berlin regularly and long visit-PPP have-INF
'According to the "Bunte", Horst Seehofer's ex-lover Anette Fröhlich is claimed to have regularly visited the CSU head in Berlin recently and for long periods.'

A similar observation has been made for Dutch by Barbiers (2002, 59, 61), who remarks that a circumstantial becomes impossible if the modal verb embeds a predicate that refers to a state that cannot be changed and when the subject NP is a name.

Likewise, Raynaud (1977, 22) has found out that epistemic modal verbs have a strong preference to select stative predicates. Investigating her corpus study that comprises 6000 modal verbs, she has demonstrated that 90 % of the epistemic occurrences of modal verbs select a stative predicate or the copula *sein*. Furthermore, she has illustrated that epistemic readings occur far less than their circumstantial counterparts. The percentage of epistemic interpretation differs from verb to verb: *mögen*: 13%, *müssen*: 10%, *können*: 3,9%, *sollen*: 2,5%, *wollen*: 0,8% and *dürfen/dürfte*: 0,1%.

As has been demonstrated in this Section, there is solid and sound evidence that circumstantial and epistemic modal verbs differ with respect to their selectional restrictions. Whereas circumstantial modal verbs are limited to the selection of predicates that refer to some sort of event, epistemic modal verbs tolerate the selection of predicates that refer to a state that cannot be changed or that refer to an event in the past. How can this circumstance be accounted for?

5.2 Circumstantial modal verbs as event modifiers

Following Kratzer (1995, 126) and Maienborn (2003, 106), there are two types of predicates: the first type contributes an (Davidsonian) event argument and the second does not. Even if the two authors do not agree on where exactly and how the boundary between the various classes of predicates is drawn, they both assume that predicates that refer to very abstract states do not involve an event argument. In opposition, event and process predicates contribute such an argument.

On closer inspection, it turns out that both authors assume that the predicates that refer to states that cannot be changed do not involve an event argument. This observation is crucial for the understanding of epistemic and circumstantial modality. As it has been demonstrated above, circumstantial modal verbs fail to embed such predicates whereas epistemic modal verbs are perfectly acceptable in such an environment. Being restricted to the selection of predicates

²⁰DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08.01. 2008.

²¹DeReKo: HMP09/JUN.01135 Hamburger Morgenpost, 14.06. 2009.

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that contribute an event argument, circumstantial modal verbs could be considered as event modifiers which are restricted to an event that will be only completed posterior to utterance time. Similar suggestions have been made by Ziegeler (2006, 83) and Maché (2008, 403). This is reminiscent of the account elaborated by Enç (1996, 354), who argues that deontic (circumstantial) modal verbs accede the time argument of its embedded predicate and shift it to the future. Likewise, Barbiers (2002, 59) has demonstrated, based on data from Dutch, that circumstantial modal verbs require complements that refer to events or to states that can be changed. In any other case an epistemic interpretation will be forced. Alternatively, this could be also related to the *Prohibition Against Vacuous Quantification* as it is stated by Kratzer (1995, 131) which the urge of a quantifier to bind a variable. In a similar fashion, one could conclude that event modifiers require a predicate which involves an event argument. In contrast, epistemic modal operators are propositional modifiers or even speech act modifiers that modify assertions. This distinction is reminiscent of the one that has been elaborated by Bech (1949) who suggests that circumstantial modal verbs aim at the realisation of the predication encoded by the infinitive complement whereas epistemic modal verbs aim at the reality or validity of the embedded predication. A similar analysis has been suggested by Colomo (2011, 63).

However, it is important to stress that epistemic modal verbs are not restricted to the selection of stative predicates. Even if the data collected by Raynaud (1977, 22) leads to the conclusion that epistemic modal verbs exhibit a striking preference for stative predicates, there are instances that embed eventive or future oriented predicates as well. This has been already demonstrated by Curme (1931, 411) for *may* and *might*. In a similar vein, Leech (1971, 68) has found that epistemic *may* obtains future reference whenever it selects an eventive predicate. Finally, Fritz (1991, 46) shows that epistemic modal verbs in Contemporary German can embed predicates that refer to past, present or future time intervals.

Yet, there are some instances of epistemic modal verbs that exhibit temporal restrictions. As Hamida Demirdache and Gilian Ramchand (pers. commun) have pointed out the English epistemic modal verb *must* can never embed predicates with a future reference. This peculiar behaviour could be due to its development. As Curme (1931, 410) has illustrated, it is a former subjunctive of the past form that has developed present indicative meaning.

Summing up, in this section the hypothesis has been formulated that circumstantial modal verbs are event modifiers. If this assumption is correct, it is predicted that stative predicates that refer to states that cannot be changed or events in the past should be incompatible with modal verbs that lack an epistemic interpretation.

5.3 The case of *can*

As far as possibility modal verbs are concerned, it is no trivial matter to keep the circumstantial (practical) possibility interpretation and the epistemic possibility interpretation apart. Some authors even claim that these interpretations cannot be distinguished. Other authors such as Fritz (1997, 96) assume that there is a strong link between the two readings. In his famous Hypothesis 20, he postulates that any modal verb that exhibits a circumstantial (practical) possibility interpretation can always be used as an epistemic modal verb:

Wenn ein Modalverb dazu verwendet werden kann, in allgemeiner Form Möglichkeit

auszudrücken, dann kann es grundsätzlich auch dazu verwendet werden, eine schwache Vermutung auszudrücken.

However, Fritz is wrong. There are a couple of modal verbs in English that do not exhibit epistemic readings. Amongst them the possibility verb *can*. As it has already been observed by Hofmann (1976, 94), Coates (1983, 85) Sweetser (1990, 62), Brennan (1993, 14), Drubig (2001, 43) and van der Auwera et al. (2005, 258), the English modal verb *can* does only allow circumstantial interpretation, at least whenever it occurs without negation or in non-negative polarity environments.

As it is granted that *can* only allows for a circumstantial interpretation, it becomes precious for the evaluation of the hypothesis formulated above: if circumstantial modal verbs are indeed event modifiers, *can* should not be acceptable in contexts in which it embeds a predication between an identified subject referent and a predicate that either refers to a state that cannot be changed or to a event in the past.

The constructed examples below have been presented to native speakers of English. The instances that include *can* have all been rejected as unacceptable. In contrast, the patterns with *could* have been considered as fully grammatical.

- (22) a. * Smerdyakov can be the murderer. (circumstantial)
 b. Smerdyakov could be the murderer. (epistemic)
- (23) a. * Smerdyakov can have killed Fyodor Pavlovich. (circumstantial)
 b. Smerdyakov could have killed Fyodor Pavlovich. (epistemic)

This behaviour corresponds exactly to the predictions of the hypothesis presented here. The assumption that circumstantial modals are event modifiers gains additional support.

Note that *can* displays quantificational interpretations in similar environments whenever the subject NP is generically interpreted such as indefinite NPs. This has been pointed out in great detail by Brennan (1993, 97) based on the observations made by Carlson (1977, 119). In cases like (24), the possibility modal verb serves as an existential quantifier over individuals: among the set of basketball players there exists at least one who is short.

- (24) A basketball player can be short. (circumstantial)

Furthermore, no use of *can* is subject to the CoDeC. There is no restriction for *can* that the embedded proposition is not part of the speaker's knowledge. Any speaker who uses *can*, can theoretically be in a position that he know that the embedded proposition is true.

The behaviour of the English modal *can* supports the hypothesis that circumstantial modal verbs are event modifiers. As it has been shown, it is restricted to a circumstantial interpretation. According to the hypothesis advocated here, it is expected that *can* as a verb that is limited to a circumstantial interpretation should not embed predications between an identified subject referent and a predicate that refers to a state that cannot be changed or to an event in the past. These predictions could be verified.

In the next sections, it will be shown that the hypothesis advocated here can be extended to other ambiguous items as well that involve an epistemic interpretation and some other root

interpretation. First of all, there are categories in German apart from (modal) verbs that exhibit such an ambiguity. All of these categories behave exactly as the hypothesis predicts. Moreover, there are various other languages that exhibit similar ambiguities of modal operators, as well. Likewise, their behaviour provides additional support to the hypothesis stated above.

5.4 Ambiguities across categories

Epistemic modification is a phenomenon that occurs frequently in different configurations. Roughly speaking, it comprises all sorts of modifiers that are evaluated with respect to the speaker's knowledge. A speaker typically employs such modifiers to indicate that the embedded proposition is not part of his knowledge. Epistemic modifiers can be realised by very different types of syntactic categories such as verbs, adverbs, particles or even adverbial clauses. Any word or complex phrase that exhibits an epistemic interpretation usually involves a further interpretation. This second non-epistemic interpretation is characterised by a higher amount of lexical content, as opposed to epistemic modifiers which are semantically bleached.

Based on observations made by Sweetser (1990), Sweetser and Dancygier (2005), Wegener (1993), Kratzer (1995, 130), Haegeman (2002, 117; 2004), Zimmermann (2004, 256), Maienborn (2004, 162) the upcoming section renders an overview over different types of epistemic modifiers and the properties they have in common. In addition, a couple of related modifiers will be considered which differ from epistemic modifiers in minor respects but which share a lot of crucial properties with them.

5.4.1 Conditionals

Following Kratzer (1978, 241; 1986, 8) conditional clauses are associated with covert modal operators. If this is correct, the approach outlined in the preceding section makes two predictions. Firstly, conditionals should allow for an epistemic interpretation and, secondly, only an epistemic interpretation should be possible with predications between an identified subject referent and a predicate that refers to a state that cannot be changed or a predicate that refers to a past event. As will be shown, both predictions are confirmed.

Based on data from English, Kratzer (1986, 8; 1995, 130), Sweetser (1990, 116), and Haegeman (2002, 125) have pointed out that modal operators in conditionals can indeed be alternatively interpreted in an epistemic way. Moreover, Kratzer (1995, 130) observes that there is a subtle distributional difference between generic *when*-clauses and *if*-clauses: Generic *when*-clauses are only acceptable in contexts with predicates that contribute an event argument (25). In contrast, *if*-clauses are also compatible with predicates that refer to a stage that cannot be changed (26).

- | | | | |
|------|----|--|---------------------------|
| (25) | a. | When Mary speaks French, she speaks it well. | (event related) |
| | b. | * When Mary knows French, she knows it well. | (event related) |
| (26) | a. | If Mary speaks French, she speaks it well. | (event related/epistemic) |
| | b. | If Mary knows French, she knows it well. | (event related/epistemic) |

Thus, it appears reasonable to conclude that generic *when*-clauses are modifiers that are restricted to an event related modification, analogously to the English modal auxiliary verb *can*. Event related modifiers are not compatible with predicates that refer to a state that cannot be changed and an epistemic interpretation is excluded. However, *if*-clauses turn out to be ambiguous between an event related interpretation and an epistemic one. As Kratzer (1995, 130) has illustrated, an epistemic interpretation becomes available as soon the *if*-clause involves a stative predicate that cannot be changed. This is exactly the way in which the modal verbs discussed in the previous sections behave. According to Kratzer (1995, 131), this behaviour is due to the *Prohibition Against Vacuous Quantification* which states that each quantifier has to bind some sort of variable. This might not be the appropriate explanation here since the modal operator does not always quantify over the event variable provided by the embedded predicate.

In a similar vein, generic *when*-clauses and event related conditionals fail to modify clauses that contain an event that temporally precedes the event of the *when*-cause. Sweetser (1990, 123) has pointed out that epistemic conditionals are felicitous in such contexts (27b). The equivalent of () headed by the subordinator *if* becomes possible again.

- (27) a. * When they have to leave a message, he has gone already. (content)
 b. If they have to leave a message, he has gone already. (epistemic)

Once more, it turns out that generic *when*-clauses and event related conditionals behave exactly like circumstantial modal verbs and that epistemic *if*-clauses share a lot of properties with epistemic modal verbs. As expected by the analysis outlined in the preceding section, propositions which contain predicates that refer to states that cannot be changed or events that precede the conditional/ *wenn*-clause event force an epistemic interpretation. In a similar manner, Haegeman (2002, 131) observes that there are two types of conditional clauses, event related conditionals that are attached to the vP and premise conditionals that are attached to the CP. The latter type roughly corresponds to the epistemic conditionals discussed here.

In German, conditional clauses are most typically headed by the subordinator *wenn*. Just as their English counterparts, they can be interpreted in an event related or in a epistemic or speech act related manner. Whenever they modify a matrix clause containing a predicate that refers to a state that cannot be changed, such as *kennen* 'know', the event related interpretation is ruled out, as illustrated in the examples (28)–(29). Likewise, the event related interpretation is not available if the modified matrix clause contains a predicate that refers to an event that has occurred prior to the event contributed by the conditional clause, as is shown in example (30)–(31). Furthermore, non-event related conditionals can embed entire speech acts such as questions (32). This raises the issue as to which extent epistemic modifiers are speech act modifiers.

- (28) Wenn Ortsbürgermeister Maik Köhler im Wahlkampf betonte, der
 if Mayor Maik Köhler in.the election.campaign stressed the
 Schulstandort Niederschelderhütte stehe nicht zur Disposition, dann kennt er
 school.facility Niederschelderhütte stands NEG to.the disposition then knows he
 die Marschrichtung seiner Partei nicht.²²
 the route.of.march his-GEN party NEG

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‘If the Mayor Maik Köhler claimed in the election campaign that the school facility Niederschelderhütte was not up to discussion, then he does not know the opinion of his own party.’

- (29) Wenn Bush behauptet, dass die Welt seit dem Einmarsch der
if Bush claims that the world after the invasion the-GEN
Koalitionstruppen sicherer geworden sei, dann lügt er.²³
coalition.troops safer became be-SBJV.PRS then lies he
‘If Bush claims that the world after the invasion of the allies became a safer place, then he is lying.’
- (30) Wenn das aber tatsächlich so ist, dann hat der so heftig attackierte Sozialstaat
if this yet indeed so is then has the so fiercely attacked welfare.state
nicht weniger, sondern mehr Geld ausgegeben²⁴
NEG less but more money spend
‘If this is indeed the case, then the fiercely attacked welfare state has spent more money rather than less.’
- (31) Wenn er glaubt, er könne sich verstecken und vor den USA und ihren
if he beliefs he can-SBJV.PRS REFL hide and from the USA and their
Verbündeten fliehen, dann hat er sich schwer getäuscht.²⁵
allies escape than has he REFL heavily erred
‘If he believes he can hide and escape from the USA and their allies then he is mistaken.’
- (32) Wenn das stimmt, warum sollen wir uns dann überhaupt mit den utopischen
if this holds why shall we us then at.all with the utopian
Steuerträumereien von Schwarz-Gelb beschäftigen?²⁶
tax.dreams of Black-Yellow occupy
‘If this is true, why should we then be concerned with the utopian dreams of the black yellow coalition about taxes?’

Epistemic conditional clauses are characterised by another crucial property. They can involve echoic antecedents. In the canonical conditional clauses, the truth value of proposition expressed by the antecedent is not known. As it has been observed by Fabricius-Hansen and Sæbø (1983, 2), there are certain instances of *wenn*-clauses in which the proposition expressed by the antecedent is known to be true. Often, examples such as (28) or (29) are referred to as echoic. In a similar vein, Haegeman (2002, 120) has demonstrated that echoic conditional clauses never exhibit an event related interpretation. Rather, they modify the entire speech act. Their ability to be echoic has interesting implications.

As it has been pointed out above, epistemic modal verbs and conditional clauses are characterised by the ability to modify predications between an identified subject referent and a predicate that denotes a state that cannot be changed or predicate that refers to an event in the past. In

²²DeReKo: RHZ05/APR.35161 Rhein-Zeitung, 29.04. 2005.

²³DeReKo: NUN06/OKT.02212 Nürnberger Nachrichten, 21.10. 2006.

²⁴DeReKo: NUN07/AUG.02550 Nürnberger Nachrichten, 22.08. 2007.

²⁵DeReKo: NUZ04/DEZ.02035 Nürnberger Zeitung, 16.12. 2004.

²⁶DeReKo: M09/NOV.93935 Mannheimer Morgen, 26.11. 2009.

the case of conditional clauses, this property does not only affect the structure that is modified (matrix clause) but also the conditional clause itself. If it is an epistemic conditional clause, it can be in principle realised as echoic clause.²⁷ And echoic clauses can in turn embed predications between an identified subject referent and a predicate that denotes a state that cannot be changed or predicate that refers to an event in the past. This is not possible with event related conditionals.

Furthermore, epistemic conditionals ensure the same functions as epistemic modal verbs. In all the examples containing epistemic conditionals that were given above, (26b), (27b) and (28)–(31), the speaker signals that he has no direct evidence for the embedded proposition (relativisation) and he indicates that the embedded proposition is consistent with the knowledge (commitment to the truth).

Apart from that, epistemic conditionals display further properties that are reminiscent of the behaviour of epistemic modal verbs. As Haegeman (2002, 133) has demonstrated, a VP anaphora can only be licensed by event conditionals but never by echoic conditionals. A similar restriction applies to epistemic modal verbs, as it will be illustrated in Section 6.7. Moreover, Haegeman (2002, 129) has shown that event related conditionals can be separated from the matrix clause in cleft sentences. In contrast, echoic event conditionals fail to be clefted under similar circumstances. This is reminiscent of epistemic modal verbs which cannot be separated from the proposition they modify *w*-clefts, as it will be demonstrated in Section 6.8.

The most important finding in this section is that epistemic conditional clauses exhibit striking parallels with epistemic modal verbs. Just as with epistemic modal verbs, epistemic conditional clauses are less restrictive with respect to the structures they modify. In more detail, they can modify predications between an identified subject referent and a predicate that denotes a state that cannot be changed or predicate that refers to an event in the past. Just with as circumstantial modal verbs, event related conditionals are hardly acceptable in all of these environments. This is due to their nature being an event modifier.

5.4.2 Causal clauses

As it has been demonstrated by Sweetser (1990, 77) and Haegeman (2002, 142) for English and Eroms (1980, 94), Wegener (1993), Uhmman (1998) and Antomo and Steinbach (2010) for German, causal conjunctions such as *because* and *weil* can come along with different interpretations: event related and epistemic. According to the analysis developed in this paper, it is expected that these adverbial clauses only exhibit an epistemic interpretation as soon as they modify a clause that contains an event that precedes the event encoded by the predicate in the adverbial clause.

As the examples provided by Wegener (1993, 296) illustrate, matrix clauses that contain an event in the past only appear to be acceptable with epistemically interpreted *weil*-clauses.

²⁷As Fabricius-Hansen and Sæbø (1983, 2) illustrates, conditional clauses in German can be headed by a couple of conjunctions: *wenn*, *falls* and *sofern*. She argues that *wenn* can only head an echoic conditional whereas *falls* and *sofern* cannot. As all of these conjunctions can occur with an epistemic interpretation, this indicates that there is no one to one correspondence between the availability of an epistemic interpretation and the ability to occur in echoic contexts. Yet, the ability to express epistemic meaning appears to be a prerequisite for being an echoic conditional clause.

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- (33) a. Es hat gehagelt, WEIL – mein Auto hat Dellen.
 it has hailed because my car has dents
 ‘It hailed, because the car has dents.’
- b. # Es hat gehagelt, weil mein Auto Dellen hat.
 it has hailed because my car dents has
 ‘It hailed because the car has dents.’
- c. Es hat gehagelt. Das behaupte ich, weil mein Auto Dellen hat.
 it has hailed this claim I because my car dents has
 ‘It hailed. I claim this because the car has dents.’

As predicted by the account here, event related *weil*-clauses cannot modify propositions which contain events that temporally precede (33b): the circumstance that the car has dents at utterance time cannot be the cause for the past hailing event. As soon as the *weil*-clause targets the proposition rather than the event argument provided by the matrix predicate, an interpretation becomes possible. In contrast to event related causal clauses, the *weil*-clause in example (33a) expresses a premise which causes the speaker to assume the proposition expressed by the matrix clause to be true: knowing that the car has dents, the speaker concludes that it must have hailed. Once more, a modifier that takes scope over a past related proposition is restricted to an epistemic interpretation.

As adverbial clauses contain a further event, the situation is more complex than with modal verbs that embed predications. Under certain circumstances, matrix clauses with past reference can be modified by event related causal clauses. This is possible in contexts in which the *weil* clause contributes an event that temporally precedes the event expressed by the matrix predicate. If the matrix predicate refers to an event in the past, an event related *weil* clause needs to involve an event that occurred even earlier in the past.

At any rate, non-epistemic *weil*-clauses are more sensitive with respect to the phrase they modify. They impose selectional restrictions as they can only modify events that happen posterior to the event that is expressed by the predicate in the *weil*-clause. In opposition, epistemically interpreted *weil*-clauses are not subject to any restriction in this respect.

Accordingly, matrix clauses that contain a predicate that refers to a state that cannot be changed are not compatible with event related *weil*-clauses unless the *weil* contributes an event that is located prior to the event provided by the matrix clause. In any other case, an event related interpretation is excluded, as it is illustrated in (34).

- (34) Wer als Finanzberater so tut, als kenne er die Wahrheit, lügt.
 who as financial.consultant so does as knows-SBJV.PRS he the truth lies
 Weil: Würde er die Wahrheit kennen, wäre er kein Finanzberater
 because would he the truth know be-SBJV.PRS he no financial.consultant
 mehr, sondern – dank der Wahrheit – unermesslich reich.²⁸
 more but thank the truth immeasurably rich
 ‘Any financial consultant that pretends to know the truth is lying. Because: if he knew the truth, he would not be a financial consultant anymore but rather immeasurably rich thanks to

the truth.’

The direct comparison between event related and epistemic *weil*-clauses is more complex than that as the different interpretations tend to come along with different word order patterns. As Wegener (1993, 295) has pointed out, event related causal clauses prefer *weil*-clauses with the finite verb in the final position, which is the canonical configuration for embedded clauses in German. However, epistemic *weil*-clauses predominantly occur in configurations with the verb in the second position which is reminiscent of the word order of main clauses. As the V2 word order with adverbial clauses is considered as language decline among normative grammarians, these patterns are suppressed in written language. Therefore they are hardly attested in corpora that are based on newspapers. Interestingly, these patterns appear to be widely tolerated as soon the *weil* is followed by a colon, as it is exemplified in example (34). In any case, Uhmman (1998, 127) illustrates that the correlation of functional difference and word order is not so categorical as there are also epistemic *weil*-clauses that exhibit the verb final order. Such patterns typically occur in fronted position and precede the entire utterance. Likewise, Scheutz (1999, 97) illustrates that *weil*-clauses with verb last word order can occasionally exhibit an epistemic interpretation even if they follow the modified clause. Yet, in this configuration it is necessary that the preceding clause, which is the target of the modification, is set off by a low final boundary tone L%.

Wegener (1993, 293) epistemic instances of *weil* can alternatively modify entire speech acts such as questions. As Sweetser (1990, 77) demonstrates, its English counterpart *because* is attested in configurations in which it modifies interrogative and directive speech acts.

Before finishing, a short note on the diachronic development of epistemic *weil* will be given. As Speyer (2011, 80) has pointed out, *weil* only became a causal conjunction in the course of the 16th century and was exclusively restricted to event related causal clauses.

As a small corpus study based on Homer’s *Odyssee* and *Illias* translated by Heinrich Voss could reveal, *weil*-clauses that modify speech acts are attested from 18th century. It merits attention that all of the instances given below be found involve verb last word order. The examples (36)–(38) exhibit a configuration in which the *weil*-clause appears fronted preceding the entire matrix clause, just as the cases described by Uhmman (1998, 127). In contrast, the example (35) contains a *weil*-clause that is realised subsequent to the modified matrix clause. What is modified here is an assertion. Yet, the causal clause does not have any epistemic resonance as the modified proposition is explicit knowledge of the speaker.

- (35) Aber der Unglückseligste aller sterblichen Menschen // Ist wie man sagt, mein
 but the unfortunate-SUP all-GEN mortal-GEN human-GEN is as one says my
 Vater, weil du mich fragtest.²⁹
 father because you me asked
 ‘But the most unfortunate of all human beings is – as I have been told – my father, as you have
 asked me.’
- (36) Aber weil Du begehrt, daß ich bleib’ und jenen erwarte; // Nun so erzähle mir
 but because you desire that I stay and him await now so tell me

²⁸DeReKo: RHZ08/OKT.16400 Rhein-Zeitung, 24.10. 2008

²⁹*Odyssee*, I, 220 translated by Heinrich Voß, 1781.

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von der Mutter des edlen Odysseus, [...] ³⁰
of the Mother the-GEN noble-GEN Odysseus-GEN

‘But as you desire that I stay and await him, tell me about the Mother of the noble Odysseus.’

- (37) Fremdling, weil du mich fragst und so genau dich erkundest, // Nun so sitze
stranger because you me asked and so exactly REFL inquire now so sit
still, erfreue dich horchend, und trinke Wein. ³¹
quietly rejoice REFL listening and drink wine
‘Stranger, as you ask me and inquire in much detail, so sit quietly, rejoice in listening and drink wine.’

- (38) Fremdling, weil du denn doch in die Stadt zu gehen verlangest [...] // Auf denn
stranger because you PART PART in the city to go desire up PART
so wollen wir gehen! ³²
so want we go
‘Stranger, as you desire to go to the city, get up and let us go!’

Related epistemic causal clauses are already attested in the 16th century, as the *dieweil*-clause in example (39) illustrates:

- (39) darab der Oberst sehr froh ward / denn er gedachte bey jhm selbst / dieweil
about.that the colonel very happy got for he thought by him self because
er zu Leuten kommen were / die etlicher massen Schiffung hetten / so
he to people come be-SBJV.PST the many size navigation had thus
ko^endte Indien nicht mehr weit seyn ³³
can-SBJV.PST India NEG more far be-INF
‘Therefore the colonel became very happy, for he thought that since he came to people with the knowledge of navigation India could not be that far any more.’

This raises again the question to which extent epistemic and speech act modifying instances of *weil*-clauses represent the same phenomenon. As it is shown in Maché (2012, 115), there is good evidence in favour of a unified analysis. Even if it turns out that these uses of *weil*-clauses should be kept apart, it cannot be denied that there is a close kinship between these phenomena.

Summing up, the analysis developed here predicts that epistemic *weil*-clause should be less restrictive with respect to the phrase it modifies. In contrast, event related causal clauses impose restriction on the clause they modify: they need to contain either an event argument or a state that came about posterior to the event expressed by the predicate in the *weil*-clause. In that respect, *weil*-clauses display a behaviour that is almost completely analogous to the one of the so-called modal verbs described above.

Likewise, epistemically interpreted causal clauses are characterised by the same sort of functions as epistemic modal verbs. Using an epistemic causal clause, the speaker indicates that he

³⁰*Odyssee*, XV, 345 translated by Heinrich Voß, 1781.

³¹*Odyssee*, XV, 389 translated by Heinrich Voß, 1781.

³²*Odyssee*, XVII, 185 translated by Heinrich Voß, 1781.

³³Ulrich Schmid, *Neuwe Welt*, p. 7a, (1567).

does not have direct evidence for the truth of the embedded proposition (Relativisation) and he signals that this proposition is in principle consistent with his knowledge (Commitment to the truth).

5.4.3 Causal *wo*-clauses

For the sake of completeness, another conjunction will be mentioned here that can be interpreted in a similar manner as epistemic *weil*. Originally, *wo* is used as a *w*-pronoun that refers to locations. In addition, it can be employed as relative adverb that introduces a relative clause that specifies locations, as Günthner (2002, 310) illustrates.

Yet, it also occurs in contexts in which it contributes causal meaning. Just as the fronted epistemic *weil*-clauses with verb final order that have been described by Uhmann (1998, 127), *wo*-clauses can render the reason for a speech act. An analogous example has been provided by Günthner (2002, 322).

- (40) Felix, wo Du gerade da bist, kannst Du mir sagen, wo der Schlüssel
 Felix where you just here are can you me say-INF where the key
 zum Druckerraum ist?³⁴
 to.the printer.room is
 ‘Felix, as you are here right now, could you tell me where the key to the printer room is?’

Zifonun (1997, 2299) has already demonstrated that adverbial *wo*-clauses can come along with a causal interpretation that provides the reason why the speaker utters the modified speech act. Her examples follow the matrix clause and contain the reinforcing particle *doch*. Likewise, Günthner (2002, 325) points out that causal *wo*-clauses act as modifiers of the speech act.

Even if they behave not in a manner that is different from the one of epistemic modal verbs, causal *wo*-clauses represent a related phenomenon. In the canonical use *wo* is restricted to the modification of an entity in the external world, whereas in the causal use it modifies the speech act itself.

5.4.4 Corrective uses of *obwohl*, *wobei* and *wiewohl*

As Günthner (1996, 339; 1999, 414; 2000a, 444) has pointed out, the concessive conjunction *obwohl* can be used in a manner that is reminiscent of epistemic *weil*. Firstly, *obwohl* occasionally heads a clause that modifies the validity of the proposition. And secondly, whenever it comes with such an interpretation, it introduces a clause that exhibits verb second word order, just as epistemic *weil*.

In its canonical use with verb last order, *obwohl*-clauses “indicate that the situation in the matrix clause is contrary to expectation in the light of what is said in the concessive clause”, as has been argued by Quirk et al. (1985, 1098) and Günthner (2000a, 442). In other words, the state of affairs expressed in the *obwohl*-clause makes it unlikely that the state of affairs expressed by the matrix clause happens to be. Briefly, the proposition denoted by the concessive clause does not have the expected consequences. Alternatively, concessive clauses could be considered

³⁴Utterance that was produced in my office 14.12.2010.

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as a particular type of conditionals which involve a negated consequent: ‘*obwohl*(p), q’ could be rephrased as ‘usually (p \supset \neg q)’, as it is assumed by Eisenberg (2004, 337). Being closely related to conditional clauses, it is expected that concessive clauses exhibit an ambiguity that behaves in a similar way to that of conditionals. In some respects, concessive *obwohl*-clauses are similar to circumstantial modal operators in that they impose clear selectional restrictions on the linguistic structure they modify: the event or state of affairs denoted by the matrix clause is canonically not prior to an independent event or state of affairs denoted by the *obwohl*-clause.

In contrast to the concessive uses of *obwohl*, configurations such as the one discussed above can be embedded by its non-canonical use without any ado, as illustrated below. Non-canonical *obwohl* clauses are characterised by a word order in which the verb surfaces as the second constituent, reminiscent of the main clause word order in German. As far as its interpretation is concerned, non-canonical *obwohl* modifies the validity of the proposition or even speech act that is expressed by the matrix clause. As Günthner (2000a, 448) argues, non-canonical *obwohl* operates on the epistemic domain, as it is used to refute an assumption and replace it by an updated assumption. These uses of *obwohl*-clauses are called corrective uses in the terminology elaborated by Günthner (1996, 339; 1999, 414; 2000a, 444). As Günthner (2000b, 320) has pointed out, an analogous contrast can be found with another concessive conjunctions *wobei* ‘albeit’. Apart from her observations, the archaic concessive conjunction *wiewohl*, which is predominantly used in written language, is occasionally used as a corrective conjunction that heads verb second clauses.

In opposition to concessive instances of *obwohl*-clauses, their corrective counterparts can modify matrix clauses that express a state of affairs that precedes the one denoted by the adverbial clause, as is demonstrated in (41)–(42). A similar behaviour can be found with the corrective uses of *wobei* (43) and *wiewohl* (44). In all of the cases given below, a concessive interpretation is ruled out, even if the word order of the adverbial clauses is transformed into verb last word order.

- (41) Aber das hat sich nun erledigt. Obwohl: Es stellt sich natürlich die
but this has REFL now complete-PPP although it poses REFL naturally the
dringende Frage, was denn mit dem Stuhl passiert ist.³⁵
urgent question what PART with the chair happened is
‘But this matter is settled now. Though, there is still the urgent question of what has happened to the chair?’
- (42) Früher stand das Kämpferische stärker im Zentrum. – Obwohl: Wir
earlier stand-PST the militant strong-COMP in.the center although we
beziehen auch heute noch immer klar Stellung.³⁶
take also today still always clearly position
‘In former times, the militant aspect was more important. Though, we also take a firm stand in these days.’
- (43) Den Arien und Ensembles hat er zusammen mit Kapellmeister Dietger Holm
the arias and ensembles has he together with bandmaster Dietger Holm

³⁵DeReKo: BRZ08/DEZ.11041 Braunschweiger Zeitung, 20.12. 2008.

³⁶DeReKo: A09/AUG.06327 St. Galler Tagblatt, 25.08. 2009.

Disches und Jelineks Worte in den Mund gelegt, wobei: Der Großteil Disch-GEN and Jelinek-GEN words in the mouth put-PPP albeit the majority des rund eineinhalbstündigen Abends besteht ohnehin aus the-GEN about one.and.a.half.hour-ADJ.GEN evening-GEN consists anyway of Reden und Spielen.³⁷

talking and playing

‘Together with the bandmaster Dietger Holm, he integrated the words of Disch and Jelinek into the arias and ensembles, albeit the majority of the evening, which lasted one and a half hours consisted of talking and playing anyway.’

- (44) „Volksverhetzung wurde 2005 (nur) 29 Mal zur Anzeige gebracht.“
 people.incitement was 2005 only 29 times to.the complaint brought
 Wiewohl: „Es gibt eine Dunkelziffer bei (rechtsextremer) Gewalt. Sie ist hoch, albeit there is a dark.figure with right.extreme violence she is high weil man Delikte meist untereinander regelt und nicht zur Anzeige because one issues mostly among.each.other clears and NEG to.the complaint bringt.“³⁸
 brings

‘In 2005, incitement of the people was (only) reported to the Police in 29 cases. Though, there is a dark figure for violence with right extreme motivation. The number is high as issues are solved among the people rather than reporting them to the Police.’

Just as in the case of *weil*-clauses, the relation between different forms and functions is not so strict. As Günthner (1999, 427; 2000b, 321) indicates, corrective *obwohl* and *wobei* clauses can exhibit a verb last order in some cases.

Even if the semantic of concessive clauses is fairly different from the one of the modifiers considered so far, they have an important property in common. They have an ambiguous counterpart, so-called corrective clauses, that operate on the propositional level. In this use, they exhibit more loose selectional restriction than their event related cognates.

5.4.5 Contrastive *während*-clauses

As it has been pointed out by Haegeman (2002, 137), there are temporal conjunctions that are ambiguous between an event related and a propositional interpretation. The conjunction *while*, refers to the simultaneity of two events in its event related interpretation, while it expresses a simultaneity of the processing of two propositions in its propositional interpretation.

As Wegener (1993, 297) among others illustrates, the temporal conjunction *während* ‘while’ can be used in an analogous manner. Like its English cognate *while*, it is ambiguous between an event related interpretation in which it expresses the simultaneity of two events and between an interpretation in which it refers to the simultaneity of the processing of two propositions. Following Haegeman (2002, 137), the propositional interpretation can be considered as contrastive

³⁷DeReKo: M12/MAR.03760 Mannheimer Morgen, 12.03. 2012.

³⁸DeReKo: BRZ06/NOV.04130 Braunschweiger Zeitung, 08.11. 2006.

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use. Interestingly, the propositional interpretation of *während* differs from its temporal cognate in the word order: just as epistemic *weil*-clauses and corrective *obwohl* and *wobei*-clauses, contrastive *während*-clauses are characterised by a verb second word order.

Freywald (2010, 61) has provided the example (45) from a corpus of spoken language:

- (45) Für Theater interessier ich mich schon, also da geh ich öfters mal hin und
for theatre interest I REFL PART thus there go I regularly once there and
auch ins Kino, während Kunstausstellungen hab ich mir eigentlich selten
also in.the cinema while art.exhibitions have I REFL actually rarely
angeguckt.³⁹
watched

‘In theatre, I am interested, well, I regularly go there and to the cinema as well, while I have hardly ever visited any art exhibitions.’

As this example illustrates, contrastive *während* can relate two clauses that contain two events which do not temporally overlap in the required manner. In canonical temporal *während*-clauses, the Topic Time of the event in the *während*-clause entirely includes the Topic Time of the event provided by the matrix clause. This condition is not met in the instance of *während* given above. Nevertheless, a contrastive interpretation is provided whereas the temporal one is ruled out. This indicates that the temporal *während*-clause imposes clear selectional restrictions on the type of event provided by the matrix predicate. In contrast, such restrictions are absent in the contrastive interpretation, which can relate propositions that involve any type of events or states.

5.4.6 *solange*-clauses

Apart from that, there are more temporal conjunctions that are ambiguous between an event related and a clause related interpretation. In particular cases, *solange* ‘as long as’ can bear an interpretation that is not event related. Being restricted to a fronted position, this type is reminiscent of fronted *wo* Günthner (2002, 322) and *weil* Uhmann (1998, 127).

The example (46) was found in my own email correspondence with Roland Hinterhölzl, in which I asked him whether he could provide me with the article written by Haegemans (2002) on Peripheral Adverbial Clauses:

- (46) So lange Du noch in Berlin bist: kannst du vielleicht noch schnell den besagten
as long you still in Berlin are can you maybe still quickly the aforesaid
Haegeman Artikel raussuchen und irgendwo deponieren, sodass ich an ihn
Haegeman article search and somewhere deposit so.that I to it
rankomme?⁴⁰
there.come

‘As long as you are still in Berlin, could you look for the aforesaid Haegeman article and leave it somewhere where I can access it?’

³⁹AGD, Rhine-Franconian background, 1961; Korpora des Archivs für Gesprochenes Deutsch, Archivs für Gesprochenes Deutsch (AGD) am Institut für Deutsche Sprache, Mannheim, <http://agd.ids-mannheim.de/>.

What is modified in (46) is not the event provided by the matrix predicate but the validity of the illocutionary force. In this particular case, the *solange*-clause modifies a question. Accordingly, an event related interpretation is not possible here. This once again demonstrates that the non-event related interpretation of modifiers is typically characterised by the lack of selectional restrictions for the event type involved in the matrix clause.

5.4.7 *bevor*-clauses

In a similar fashion, temporal clauses that are headed by the conjunction *bevor* ‘before’ can be interpreted in an event-related and a clause related way. They are restricted to the fronted position, just as *wo* and *solange*-clauses are.

In its event related interpretation, the *solange*-clause modifies a matrix event that temporally proceeds the event that is provided in the adverbial clause. In opposition to that, it modifies the validity of the matrix speech act. The person who utters (47) wants that the modified proposition is accepted by the addressees before they start to write angry letters to the editor. What he furthermore intends is that they addressees could change their minds if they acknowledge the modified utterance that women are a minority in the executive suits. The example provided in (48) behaves in a similar way, yet, the modified illocution is a directive speech act:

- (47) Und bevor jetzt wieder böse Leserbriefe kommen: Frauen sind von der Anzahl
 an before now again bad letters come women are of the number
 her im Norden natürlich keine Minderheit, jedoch in den Chefetagen.⁴¹
 from in.the North naturally no minority, yet in the executive.suits
 ‘Before we will receive letters of angry readers (let me concede): As far as their number is
 concerned, women are not a majority in the North, yet, they are in the executive suits.’
- (48) Bevor Sie jetzt Ihren Bettvorleger zerschneiden, denken Sie bitte mal eine
 before you now your bedside.carpet cut think-IMP you please once a
 Minute nach.⁴²
 minute after
 ‘Before you start to cut your bedside carpet, meditate a minute!’

Once again, what is modified here is not the event but the validity of the assertion or illocutionary force. Furthermore, the selectional restrictions on the event provided by the matrix clause are suspended.

5.4.8 Final *damit*-clauses

Apart from *weil*-clauses, *wo*-clauses, *solange*-clauses and *bevor*-clauses, there are further adverbial clauses that occur in the fronted position obtaining a non-event related interpretation, such as clauses headed by the conjunction *damit*.

In their canonical use, *damit*-clauses are associated with a final meaning, as is shown in Eisenberg (2004, 338) and Eisenberg et al. (2005, 639). Accordingly, they express the purpose of

⁴¹DeReKo: HMP12/MAR.00699 Hamburger Morgenpost, 08.03.2012.

⁴²DeReKo: NUZ10/FEB.01329 Nürnberger Zeitung, 13.02.2010.

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the action denoted by the matrix clause. In other terms, final *damit*-clauses modify an event that is either explicitly expressed by the matrix predicate, or an event that has caused the state of affairs expressed by the matrix clause. Typically, this matrix event temporally proceeds the event encoded by the *damit*-clause. Hence, the use of a *damit*-clause implies that there is an agent who is in control of the situation expressed by the matrix clause. This exertion of control can be considered as an event. Correspondingly, final *damit*-clauses can be regarded as event modifiers restricted to events that are intentionally performed by an animate referent.

In opposition to these uses, there are cases in which the *damit*-clauses modifies the speech act. In these instances, the *damit*-clauses reveal the purpose of why the speaker would utter the matrix clause. Once again, the selectional restrictions imposed on the event are dropped in (49)–(51). None of the matrix clauses involved in the utterances below are associated with an event that is intentionally performed. Accordingly, they cannot be modified by canonical *damit*-clauses. Rather, the only action which is intentionally performed is the act of uttering the matrix clause and as a consequence it is this action that is modified by the *damit*-clause.

- (49) *Damit* Du gar nicht erst fragen musst: Von den beiden, die wir kennen,
in.order.that you INTN NEG first ask-INF must of the two that we know
ist keiner darunter.⁴³
is none among
'Just that you do not need to ask: There is none among them of the two we know.'
- (50) *Damit* Sie wissen, mit wem Sie es zu tun haben: Ich bin 42 Jahre alt,
in.order.that you know with whom you it to do have I am 42 years old
ledig, von Beruf Bankangestellter und in meiner Freizeit im
unmarried of profession bank.clerk and in my free.time in.the
kirchlichen Bereich in meiner Pfarrei für die Missionsarbeit und
church domain in my parish for the proselytisation and
Entwicklungshilfe in den Ländern wie Südamerika, Afrika, Asien usw.
development.assistance in the countries like South.America, Africa, Asia a.s.f.
zuständig.⁴⁴
responsible
'Just that you know with whom you are dealing: I am 42 years old, unmarried, a bank clerk and in my free time, I am engaged in the church in my parish where I am responsible for the proselytisation and development assistance in countries such as Southern America, Africa, Asia, and so forth.'
- (51) *Damit* Sie mich nicht falsch verstehen: Es hat mich nicht sexuell erregt!⁴⁵
in.order.that you me NEG wrong understand it has me NEG sexually excited
'Just so that you do not get me wrong: it has not excited me sexually.'

In all of the examples given above, an event related reading is ruled out. In example (50), for instance, the bank clerk is not intentionally being 42 years old in order to demonstrate to

⁴³DeReKo: NUZ03/JUL.00086 Nürnberger Zeitung, 01.07. 2003.

⁴⁴DeReKo: R99/DEZ.98038 Frankfurter Rundschau, 02.12. 1999.

⁴⁵DeReKo: HMP06/NOV.02363 Hamburger Morgenpost, 23.11. 2006.

the addressee who he is. The remaining examples function in an analogous manner. A similar example is briefly discussed by Leys (1991, 173) who analyses it as a ‘parenthetical’ use of *damit*. Furthermore, this pattern is mentioned in Reis and Wöllstein (2010, 135 Fn. 31).

Again, the situation is much reminiscent of modal verbs. *damit*-clauses are ambiguous between two different patterns. In the first, they act as event modifiers that impose selectional restrictions on the type of event. Event related *damit*-clauses are restricted to the modification of events that are intentionally performed by some agent. In contrast, speech act related *damit*-clauses can be combined with matrix clauses that involve any type of event, or that may even lack a Davidsonian event argument at all.

5.4.9 Adverbial infinitives

Apart from finite adverbial clauses, there are other types of modifiers that exhibit an analogous ambiguity, such as adverbial infinitives. As it has been pointed out by Leys (1991), Eisenberg (1992, 220) and Eisenberg (2004, 376), adverbial infinitives that are headed by *um* can occur with a variety of meanings: intentional/final, teleological, prospectives and meta communicative/parenthetical.

Most of the final and teleological interpretations involve a referential identity between the matrix subject and the subject argument of the infinitive (subject control). Yet, it has been shown by Clément (1986, 263) and Eisenberg (1992, 213) that this does not need to be the case and that the infinitive subject can be identified by arbitrary control, if the matrix predicate does not select any argument that is an appropriate intentional agent.

Among the various interpretations, there is a group that clearly exhibits characteristics of speech act modification. As it has been already pointed out by Leys (1991, 173), they are reminiscent of parenthetical uses of *damit*-clauses which have been identified as speech act modifiers in the previous section. Likewise, Eisenberg (2004, 376) argues that these instances have a meta-communicative function.

Yet, meta-communicative *um-zu* infinitives slightly differ from speech act related *damit*-clauses in a subtle but crucial syntactical respect: they can be fully syntactically integrated into the matrix clause, occupying the position in pre-field preceding the finite verb, as it is illustrated in (52). As with *damit*-clauses, meta-communicative *um-zu* infinitives can be placed externally to the matrix clause, in the position preceding the pre-field, as shown in (53) and (54).⁴⁶ Similar examples have been discussed by König and van der Auwera (1988, 110). In order to ensure a clearer contrast, the same type adverbial infinitive has been chosen in the examples given below.

- (52) Er habe etwas getrunken, sagt der 33jährige Angeklagte. Um
 he has-SBJ.PRS something drunken said the 33.years.old accused around
 genau zu sein, hatte der Tischlermeister aus St. Veit 2,4 Promille Alkohol
 precise to be-INF had the master.carpenter from St. Veit 2.4 per.mil alcohol
 im Blut.⁴⁷
 in.the blood

⁴⁶The availability of the latter pattern has pointed out to me by Oliver Schallert.

⁴⁷DeReKo: K98/MAR.17494 Kleine Zeitung, 05.03.1998.

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'The 33 year old accused said that he had drunken a bit. To be precise: the master carpenter had 2.4 per mil alcohol in his blood.'

- (53) Und Bayern ist alt. Um genau zu sein: Es ist einer der ältesten
and Bavaria is old around precise to be-INF it is one the-GEN oldest-GEN
Staaten Europas.⁴⁸
states-GEN Europe-GEN

'And Bavaria is old. To be precise: it is one of the oldest states in Europe.'

- (54) eine amerikanische Wissenschaftlerin hatte festgestellt, dass Frauen mehr reden
a American scientist had observed that women more talk
als Männer. Um genau zu sein: Frauen reden am Tag etwa 20 000
than men around precise to be-INF women talk at.the day about 20 000
Wörter, Männer dagegen nur 7000.⁴⁹
words men in.contrast only 7000

'An American scientist has observed that women talk more than men. To be precise, women talk about 20.000 words a day, whereas men only talk 7.000.'

Patterns in which the speech act oriented *um-zu* infinitive is syntactically integrated into the matrix clause, such as in (52), provide a remarkable paradox. On the one hand, they appear to be integrated into the Vorfeld (prefield) position in the matrix clause and on the other hand, they contain an operator that takes scope over the entire matrix clause. This somewhat reminiscent of epistemic modal verbs which involve a similar paradox. Yet, authors such as Reis and Wöllstein (2010, 155–157) assume that this type of modifiers occupies a position external to the matrix clause rather than the Vorfeld position. But their view is challenged, since there are speech act modifiers which occur in the middle field and which do not exhibit an intonation for parenthetical utterances, as will be shown in Section 5.4.12.

Speech act oriented adverbial *um-zu* infinitives have already been observed by Behaghel (1924, 364), who has suggested an ellipsis analysis, as is illustrated below.

- (55) Um es kurz zu machen [sage ich nichts weiters als:] ich bleibe da,⁵⁰
around it short to make-INF say I no more than I stay here
'In order to keep it short [I say:]: I will stay here.'

In addition to the observations made by the scholars quoted above, there is another type of adverbial infinitives in German which exhibits an ambiguity between an event related and a speech act related interpretation: *ohne-zu* 'without to' infinitives. As with speech act oriented adverbial *um-zu* infinitives, they are attested in two different environments: they can be integrated into the matrix clause, occupying the pre-field position preceding the finite verb (57), alternatively, they can be placed in the position preceding the pre-field, externally to the matrix clause, as is illustrated in (56):

⁴⁸DeReKo: E97/JUL.16625 Zürcher Tagesanzeiger, 08.07.1997.

⁴⁹DeReKo: BRZ07/JUL.10094 Braunschweiger Zeitung, 17.07.2007.

⁵⁰DeReKo: RHZ08/AUG.08340 Rhein-Zeitung, 09.08.2008.

- (56) Ohne übertreiben zu wollen: Das ist eine Mannschaft, die in der Liga eine gute Rolle spielen wird.⁵¹
 without exaggerate to want-INF that is a team that in the league a good role play will
 ‘I do not want to exaggerate: this is a team which will play an important role in the league.’
- (57) Verzeihung, aber ohne übertreiben zu wollen, sind die Beatles die kommerziell erfolgreichste Popgruppe aller Zeiten, das kann man ruhig auch so schreiben.⁵²
 sorry but without exaggerate to want-INF are the Beatles the commercially successful-SUP pop.group all-GEN times-GEN that can one just also so write-INF
 ‘Sorry, I don’t want to exaggerate, but the Beatles are the most commercially successful pop group of all times, it is okay to put it just this way.’

As illustrated, adverbial *ohne-zu* infinitives with a speech act related interpretation prefer environments in which they occupy a position external to the matrix clause, as is exemplified in (56). Instances in which they are syntactically integrated into the matrix clause such as (57) are less frequent and mostly represent spoken language.

As regards selectional restrictions, event related *ohne-zu* infinitives impose the same type of requirements as their cognates which are headed by *um-zu*. Once again, speech act related *ohne-zu* infinitives lack such restrictions for events.

5.4.10 VP adverbs

Aside from adverbial clauses, there are further types of modifiers which display an ambiguity that is reminiscent of those under discussion here, such as VP adverbs. Being closely related in semantical respect, these items are of particular interest for the study presented here. As discussed by Helbig and Helbig (1990, 58), there are a couple of adverb like modifiers in German that have grammaticalised into items that can be used to label a proposition as hypothesis: *bestimmt* ‘definitely’, *kaum* ‘hardly’, *sicher* ‘certainly’, *vermutlich* ‘presumably’, *vielleicht* ‘maybe’, *wohl* ‘perhaps’. Some of them, such as *sicher*, still exhibit an ambiguity between an event related interpretation (‘safely’) and an epistemic interpretation (‘certainly’):

- (58) a. Er hält den Ball nicht sicher.
 He holds the ball NEG safe.ADV
 ‘He doesn’t hold the ball safely’ (event related)
- b. Mitja ist sicher der Mörder.
 Mitja is safe.ADV the murderer
 ‘Certainly, Mitja is the murderer’ (epistemic)

⁵¹DeReKo: RHZ08/AUG.08340 Rhein-Zeitung, 09.08.2008.

⁵²DeReKo: WDD11/T43.58743: Diskussion:The Beatles/Archiv/2009, In: Wikipedia – URL:http://de.wikipedia.org/wiki/Diskussion:The_Beatles/Archiv/2009: Wikipedia, 2011.

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Again, *sicher* in its event related reading is restricted to predicates that involve an event argument (58a), but it does not show any selectional restrictions in its epistemic reading (58b). Accordingly, epistemic adverbs are also compatible with predicates that denote states that cannot be changed. As it turns out, the analysis presented here can even be extended to adverbs that are ambiguous between an event related reading and an epistemic reading.

Moreover, they are used for similar purposes to epistemic modal verbs. They indicate that the modified proposition is not based on the speaker's direct evidence and that it is nevertheless consistent with the knowledge of the speaker. In a similar manner, Zimmermann (2004, 256) shows that *wohl* indicates that the modified proposition is not part of the speaker's knowledge.

5.4.11 Locative modifiers

In a recent paper, Maienborn (2004, 162) has pointed out that under certain conditions locative modifiers may also be interpreted epistemically. According to traditional assumptions (cf. Kratzer (1995, 127)), locative modifiers are restricted to predicates that provide an event argument and obtain an ungrammatical interpretation whenever combined with a predicate that refers to a state that cannot be changed. As Maienborn (2004, 162) demonstrates, this is not quite true since locative modifiers such as *in the car* in (59b) can function as a frame modifier, conveying an epistemic reading.

- (59) a. In the car, Mary was tired. (event related)
b. In the car, Mary was blond.
'In the car, (you still claimed that) Mary was blond' (epistemic)

As Maienborn (2004) observes, the epistemic interpretation arises whenever the locative modifier bears scope over a predication between a definite subject and a predicate that refers to a state that cannot be changed. This is exactly what is predicted by the analysis elaborated in this paper.

The interpretation of epistemic locative modifiers is somewhat reminiscent of quotative modal verbs. The function of relativisation applies with respect to the speaker, who stresses that the modified proposition is based on his own direct evidence. However, the commitment to the truth is not evaluated with respect to the speaker. In example (59b), some other referent is committed to the truth, who is indirectly introduced by the situation to which the locative modifier *in the car* refers. The referent has to be a person that was present in the car. Crucially, it is not the speaker who signals that the modified proposition is consistent with his knowledge. In some cases, he could know that this proposition is even false. In opposition, the referent introduced by the locative modifier has made a commitment to the truth of the proposition in the situation when he was in the car.

5.4.12 *Noch einmal*

Furthermore, there are temporal adverbs that can be employed to modify a speech act. In its canonical temporal use, *noch* 'still, yet' can be considered as durative adverb, as suggested by Eisenberg (2004, 217). As it is argued in Eisenberg et al. (2005, 582), durative *noch* additionally involves expectations of the speaker. In other words, it specifies a given moment in temporal

interval just before the speaker expects it to end. Whenever *noch* modifies the temporal adverb *einmal* ‘once’ which is classified as iterative by Eisenberg (2004, 218), it can be used to modify speech acts.

In opposition to its event related reading, the speech act related of *noch einmal* indicates the iteration of the entire act of the utterance, rather than the iteration of the matrix event. Accordingly, its use implies that the speaker has already uttered the same act to the addressee before.

As is demonstrated in (62)–(61), the compound *noch einmal* can modify assertions. Moreover, it can also modify other illocutionary acts such as questions (63)–(66).

- (60) Noch einmal: Dutschke war kein Pazifist, aber er legte keine Bombe.⁵³
 once again Dutschke was no pacifist but he lie no bomb
 ‘Once again: Dutschke was no pacifist, but he did not plant a bomb.’
- (61) LAMBRECHT: Noch einmal: Mich interessieren die Inhalte und weniger, wer
 Lambrecht once again me interests the content and lee who
 welches Ministerium besetzt.⁵⁴
 which ministry occupies
 ‘LAMBRECHT: “Once again: I am interested in the content and less who occupies which
 ministry.” ’
- (62) FISCHER: Noch einmal: Die Verhandlungen mit der ÖVP sind gescheitert.⁵⁵
 once again the negotiations with the ÖVP are failed
 ‘FISCHER: “Once again: the negotiations with the ÖVP failed.” ’
- (63) Irgendwie erinnert einen das alles an etwas: diese Collagen aus
 somehow remembers one that all about something these collages of
 bildhaften Elementen und Textbruchstücken, diese geometrischen Formen, die
 pictorial elements and text.fragments these geometrical forms that
 sich zu Gesichtern und menschlichen Figuren zusammenfügen. Wer hat noch
 REFL to faces and human figures coalesce who has once
 einmal so gemalt? Man kommt nicht drauf.⁵⁶
 again so painted one comes NEG on.it
 ‘Somehow, this reminds you of something: these collages made of pictorial elements and
 text fragments, these geometrical forms that coalesce to faces an human figures. Once again:
 who has painted like that? You cannot guess it.’
- (64) Noch einmal, wer holt die Katze aus dem Sack?⁵⁷
 once again who takes the cat out the bag?
 ‘Once again, who lets the cat out of the bag?’

⁵³DeReKo: NUN04/DEZ.01147 Nürnberger Nachrichten, 10.12. 2004.

⁵⁴DeReKo: M05/OKT.83589 Mannheimer Morgen, 13.10. 2005.

⁵⁵DeReKo: K00/JAN.05638 Kleine Zeitung, 22.01. 2000.

⁵⁶DeReKo: RHZ11/NOV.22192 Rhein-Zeitung, 21.11. 2011.

⁵⁷DeReKo:SOZ10/DEZ.00220 Die Südostschweiz, 01.12.2010.

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- (65) Wie lautet noch einmal das neue Wort des Jahres? Richtig:
How sounds once again the new word the-GEN year-GEN right
Wutbürger.⁵⁸
Indignant.Citizen
'What is again the new word of the year? Right: Indignant Citizen.'
- (66) Philipp Lahm: Wer ist noch einmal Maicon?⁵⁹
Philipp Lahm who is once again Maicon
'Philipp Lahm: Once again, who is Maicon?'

It merits closer attention that *noch einmal* exhibits the strikingly similar contrast as modal verbs with respect to the selectional restrictions. It is confined to the modifications of predicates that involve an event argument in its event related interpretation. The modification of predication between an identified individual and a predicate that refers to a state that cannot be changed is not possible. As a consequence, in the examples (65), (66), (60), a speech act related interpretation of *noch einmal* is only possible. Secondly, it is to a lesser degree compatible with past related predicates, if *noch einmal* remains unstressed, as it is illustrated in (63) and (62).

Apart from that, the speech act related use of *noch einmal* is characterised by a further remarkable peculiarity. As with the adverbial *um-zu* and *ohne-zu* infinitives discussed in Section 5.4.9, it can alternatively be realised in a position that is syntactically integrated into the matrix clause or in a position that is external to the matrix clause. Whenever the speech act related use of *noch einmal* modifies a question, it can occupy a position outside from the matrix clause, as exemplified in (64). In such an configuration, it fails to be interpreted in an event related manner. Moreover, it can be part of the matrix clause as illustrated in (66) or (65). Nevertheless, *noch einmal* takes scope over the *wh*-operator yielding an interpretation like: *Once again I want to know from you: What is the new word of the year?* These configuration appear to involve speech act modifiers are integrated into the matrix clause challenging the view entertained by Reis and Wöllstein (2010, 155) who argue that the typical position for non-integrated adverbial clause is always external to the matrix clause.

Once again, cases of speech act related *noch einmal* that are syntactically integrated into the matrix clause reveal a remarkable paradox. On the one hand, they are integrated into the matrix clause and on the other hand, they contain an operator that takes scope over the entire matrix clause. In this respect, they share an essential characteristic with epistemic modal verbs, which are also part of the matrix clause and which take scope over at least the entire proposition.

5.4.13 Past operator

Asides from that, there are even abstract operators that are ambiguous between an event related interpretation and one that is closely related to the epistemic interpretation of modal verbs. As Kratzer (1995, 155) argues, the past tense operator typically exhibits characteristics of an event modifier. This becomes most obvious in some cases in which it modifies a predicate that refers to a state that cannot be changed. This predicate will be reinterpreted as a predicate that denotes a state that is temporarily confined, just as a predicate that involves an event argument does:

⁵⁸DeReKo: M10/DEZ.89119 Mannheimer Morgen, 21.12. 2010.

⁵⁹DeReKo: NUN10/JUL.00511 Nürnberger Nachrichten, 05.07. 2010.

The past tense is an effective tool for turning individual level predicates into stage-level predicates. In this case, the tense predicate is a predicate for a Davidsonian argument

In some particular cases in which the individual and the property cannot be separated, a past tense operator will yield an interesting effect. In its most natural interpretation, example (67) implies that the individual *Henry* is located in the past, in other words that he is not alive anymore. Kratzer argues that, in this reading, the predicate *French* lacks an event argument. As a consequence, the past tense operator has to modify another element. She concludes that what is located in the past is not an event, but the individual *Henry*.

(67) Henry was French.

In a more uniform analysis, of the past tense operator one could assume that it acts as an event modifier in these cases as well. Accordingly, *French* would be reinterpreted as a temporary confined state and supplied with an event argument by means of a pragmatic mechanism as the ones suggested by Kratzer (1995, 148) and Maienborn (2003, 178, 193, 216). The implication that *Henry* is not alive anymore could then be considered as a result of a pragmatic conclusion: if the properties of being *Henry* and being *French* cannot be separated and if the event of *x* being *French* is located in the past, the event of *x* being *Henry* is also located in the past.

The past tense operator behaves in a similar way in German, as is shown in (68). Yet, there are contexts in which the use of a past tense operator with an inseparable property does not imply the decease of the individual encoded as the subject of the clause. When I returned to Berlin, I met a former fellow student who has forgotten a little bit of my personal background. So, she asked me again about my origin (69).

(68) Hermann Maier war aus Österreich.
Hermann Maier was from Austria
'Hermann Maier was Austrian.'

(69) Du warst doch aus Österreich.
you were PART from Austria
'As far as I remember, you told me once that you were from Austria.'

What is located in a past time interval, is neither the property of being Austrian nor my presence but the validity of the proposition *Jakob is from Austria*. What my former fellow student wanted to indicate, is that she has forgotten to what extent this proposition is indeed valid. Crucially, she refers to a context in the past in which the proposition was qualified as valid. Arguably, the example given above is more complex, because it was used as a type of tag question, as the presence of the particle *doch* suggests. The intention behind this utterance in (69) is to communicate that the embedded proposition was valid in a certain context in the past, e.g. that it was asserted by some discourse participant.

5.4.14 Meta-communicative *why*

Finally, there are other types of operators that can be ambiguous between an event related and an epistemic or a speech act related interpretation. As Ginzburg (2012, 308) has demonstrated,

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there are adverbial *wh*-pronouns that can alternatively bear scope over a speech act. In its canonical event related use, *why* is a request to the addressee to indicate the reason that causes a given event or a state to happen. In contrast, the use of *why* in (70c) is no request to provide the cause for a certain event. Rather, Jerry wants to know the reason which causes Emma to ask when she did last see him in (70b). Accordingly, what is modified here is not an event but rather the entire speech act. This short discourse is taken from Harold Pinter's *Betrayal* and has been provided by Ginzburg (2012, 308):

- (70) a. JERRY: How's Robert?
b. EMMA: When did you last see him?
c. JERRY: I haven't see him for months. Don't know why. Why?
d. EMMA: Why what?
e. JERRY: Why are you asking when I last saw him.

In a similar manner, meta-communicative questions can be used to modify epistemic assumptions, as is illustrated in the discourse below. The example contains the German counterpart of meta-communicative *why*, which is realised as the *wh*-pronoun *warum*.

- (71) a. A: Wer könnte das Feuerzeug hier vergessen haben?
 who could the lighter here forgot have-INF
b. B: Tanja hat das Feuerzeug vergessen.
 Tanja has the lighter forgot
c. A: Warum?
 why
d. B: Weil sie ist die einzige hier im Haus, die raucht.
 because she the only here in.the house is who smokes
 'A: Who may have forgot this lighter?'
 'B: Tanja has forgot it.'
 'A: Why?'
 'B: Because she is the only one here who smokes.'

In its meta-communicative use, the *w*-pronoun *warum* can alternatively be replaced by *wieso*. In their ability to modify *wh*-questions and assumptions, meta-communicative *why* and *warum* reminiscent of epistemic and speech act related *because*-clauses. In other words, meta-communicative *why* and *warum* are the direct *wh* counterparts of epistemic *because* and *weil*-clauses. This is most convincingly demonstrated in the discourse given above, in which B employs an epistemic *weil*-clause with verb second verb order (71d) in order to answer the meta communicative *warum* question. Alternatively, an epistemic *weil*-clause with verb last order is also acceptable in this place, of the type that has been observed by Scheutz (1999, 97).

5.4.15 Summary

In this section, a whole range of related ambiguous modifiers in German were reviewed. All of them modify lexical predicates, yet, the syntactic realisation of that predicate differs from

modifier to modifier. Whereas modal verbs modify non-finite complements, adverbial modifiers modify the matrix predicate of a finite clause. It has been shown that, despite their semantic differences, the ambiguous modifiers reviewed here behave analogous in a crucial matter. In their original interpretation, they impose selectional restrictions on the lexical predicate with respect to the specification of the event argument it contains. In their less canonical reading, these selectional restrictions are no longer active. From this it follows that there are modifiers that are ambiguous between an event related and a propositional or even speech act related interpretation.

As regards their semantic nature, two groups of modifiers have to be distinguished: Firstly, there are modifiers that, in their original variant, impose very strict restrictions on the lexical predicate with respect to the specification of the event argument it provides. Circumstantial modal verbs fail to embed predications between an individual and a predicate that refers to an eternal state or a event in the past. From this, one could conclude that circumstantial modal verbs are restricted to the modification of predicates that involve an event argument which is not completed by utterance time. In other words, they are event modifiers. This equally holds for canonical *wenn*-conditionals, which are assumed to also involve a (circumstantial) modal operator. Likewise, VP adverbs and locative modifiers require lexical predicates that involve an event argument. To a lesser extent, this behaviour is found with causal *weil* clauses, *noch einmal*, meta-communicative *warum* and the past tense operator, as well. In their more grammaticalised variant, most of these modifiers can be used as genuine epistemic modifiers, which indicate that the modified proposition is not part of the deictic centre's knowledge. In their epistemic interpretation, these modifiers cease to be event modifiers. As their selectional restrictions with respect to the event type are dropped, they rather act as propositional or even as speech act modifiers.

Secondly, there are modifiers that are less restrictive with respect to the event type of the matrix predicate in their original variant such as concessive *obwohl*, *wobei*, *wiewohl* clauses, temporal *während* clauses, *solange*-clauses and *bevor*-clauses, final *damit*-clauses, adverbial *um-zu* and *ohne zu* infinitives. Yet, all of these modifiers exhibit selectional restrictions of some type, but they are not always formulated with respect to the event type that is provided by the matrix predicate. These restrictions are idiosyncratic and differ from modifier to modifier. In contrast, their more grammaticalised variants do not involve such selectional restrictions. Furthermore, they also differ from genuine epistemic modifiers with respect to their interpretation. Whereas epistemic modifiers are interpreted with respect to the deictic centre's knowledge the modifiers of the present group are not. Instead, they modify the speech act. Accordingly, corrective *obwohl*, *wobei*, *wiewohl* clauses, contrastive *während* clauses, *solange*-clauses, *bevor*-clauses, *damit*-clauses, adverbial *um-zu* and *ohne zu* infinitives should be considered as speech act modifiers.

At this point the question arises, to what extent epistemic modifiers and speech act modifiers are part of the same phenomenon. In her study, Sweetser (1990) meticulously keeps these two interpretations apart, arguing that the distinction is a result of their processing in different mental domains. Yet, her classification is not so obvious. As suggested in Maché (2012, 115), epistemic modifiers as a subtype of speech act modifiers; in more detail, as speech act modifiers that modify assertive speech acts. Such an account, is supported by the fact that the epistemic and the speech act related interpretation of causal conjunctions in French are realised by the same

lexical means: *puis que*, as the data collected by Sweetser (1990, 81) illustrates. In contrast, event related causal clauses are headed by the conjunction *parce que*. In order to maintain Sweetser's analysis, it is necessary to demonstrate that there are languages or earlier stages of languages in which the epistemic and the speech act related interpretation of a given type of conjunction is realised by different lexical items. Aside from that, it remains to be shown that the epistemic interpretation of the known conjunctions indeed developed prior to the corresponding speech act interpretation. In any case, the precise relationship between the epistemic and the speech act related interpretations of a given conjunction is not fully understood yet. Due to these circumstances, the terminology for the modifiers discussed in the previous sections is not uniform.

At any rate, there are aspects that indicate a close relationship between epistemic and speech act related modifiers. As it has been demonstrated in the previous section, there are a couple of modifiers that are syntactically integrated into the matrix clause which can bear scope over the entire speech act that is associated with the matrix clause, such as *noch einmal* and adverbial *um-zu* and *ohne-zu* infinitives. This behaviour is reminiscent of that of epistemic modal verbs, which are integrated into the matrix clause in syntactic respect and which seem to bear scope at least over the proposition.

Of course, the enumeration of epistemic modifiers given above is not exhaustive, there are certainly many other related phenomena which remain to be discovered. Moreover, there are types of epistemic modifiers which have not received so much attention yet such as the speech act predicates described by Sweetser (1990, 69), based on an observation made by Tregidgo (1982, 76). As she argues, speech act predicates such as *insist* are ambiguous between a circumstantial and an epistemic interpretation. In its circumstantial interpretation, it encodes an obligation: (*I insist that you go to London*); in its epistemic use, it encodes a commitment to the truth: (*I insist that you DID go to London*). Interestingly, the epistemic use is once again compatible with a past event, whereas the circumstantial use does not seem to be.

Despite their semantic heterogeneity, it cannot be denied that the modifiers reviewed in this section share some essential characteristics. Firstly, they involve selectional restrictions in their more original variant, most likely to be formulated with respect to the specification of the event provided by the modified predicate. Secondly, these selectional restrictions are no longer active in their more grammaticalised variant. This indicates that the more grammaticalised variants occupy a higher position in the clausal hierarchy.

5.5 Ambiguities across languages

Epistemic modality has been most extensively investigated with respect to modal verbs or auxiliaries. Initially, the research focussed on West Germanic languages, in particular English, German and Dutch. In the course of time, different suggestions have been developed how to cope with the systematic ambiguity of these modifiers such as the analyses put forth by Ross (1969, 86), Fourquet (1970), Jackendoff (1972, 102), Lyons (1977, 791), Kratzer (1978, 1981), Palmer (1986), Öhlschläger (1989), Sweetser (1990), Brennan (1993), Diewald (1999), Abraham (2001), Reis (2001), Erb (2001), Wurmbrand (2001), Nuyts (2001a,b), Butler (2003), and Roberts (2003). Regardless of the different perspectives they take, they all agree that circum-

stantial modals denote a possibility or necessity in the external world and that epistemic modals refer to some abstract necessity or possibility in the internal knowledge of the speaker.

In more recent research, the attention was extended to further languages: Germanic languages such as Danish (Boye 2010), Norwegian (Eide 2005) and further Scandinavian languages (Thráinsson and Vikner 1995), Romance languages such as Italian (Milan (2001), Pietandrea (2005) and Hacquard (2006, 31)), French (Hacquard 2006, 25) and Spanish (Demirdache and Uribe-Etxebarria 2008, 1809). As illustrated by Hacquard (2006, 31), the two Italian modal verbs which usually express a circumstantial modality, the possibility modal verb *potere* ‘can’ and the necessity modal verb *dovere* ‘must’ can alternatively be interpreted in an epistemic way, instances of the epistemic variant are given in (72) and (73). Furthermore, she shows that the same contrasts hold for the French possibility modal verb *pouvoir* and its necessity counterpart *devoir*, as pointed out in (74)–(75). A similar example is provided by Cornillie et al. (2009, 109). Moreover, Hacquard (2006, 25, 55) provides further examples for the epistemic possibility modal verb *pouvoir* and the epistemic necessity modal verb *devoir* in a slightly different configuration, as exemplified in (76) and (77). Moreover, Demirdache and Uribe-Etxebarria (2008, 1809) point out that this type of ambiguity can be equally found in Spanish. The necessity modal verb *deber* which originally expressed a circumstantial modality admits in addition an epistemic reading, as illustrated in (78).

- (72) Bingley può aver parlato a Jane.
Bingley might have-INF speak-PPP to Jane
‘Bingley might have spoken to Jane.’ (epistemic)
- (73) Bingley deve aver parlato a Jane.
Bingley must have-INF speak-PPP to Jane
‘Bingley must have spoken to Jane.’ (epistemic)
- (74) Bingley peut avoir parlé à Jane.
Bingley might have-INF talk-PPP to Jane
‘Bingley might have talked to Jane.’ (epistemic)
- (75) Bingley doit avoir parlé à Jane.
Bingley must have-INF talk-PPP to Jane
‘Bingley must have talked to Jane.’ (epistemic)
- (76) Jane a dû prendre le train.
Jane has must-PPP take-INF the train
‘Given my evidence now, it must be the case that Jane took the train then.’ (epistemic)
- (77) Bingley a pu parler à Jane.
Bingley has can-PPP speak-INF to Jane
‘Given my evidence now, it could be the case that Bingley spoke to Jane then.’ (epistemic)
- (78) Pedro ha debido ganar la carrera.
Pedro has must-PPP win-INF the race
‘Pedro must have won the race.’ (epistemic)

circumstantial interpretation is excluded. As it has been discussed above, it is reasonable to assume that this type of predicate does not involve an event argument. This, in turn, is in favour of the assumption that circumstantial modal operators are event modifiers and that epistemic modifiers embed elements that are more complex than that such as propositions or speech acts.

To a smaller extent, modal verbs exhibit such an ambiguity in Slavic languages such as with Russian *moch* ('can, be able to'), as demonstrated by Kotin (2008, 382). Furthermore, ambiguous modal verbs occur in Greek (*prepi* ('must') and *bori* ('may')) and in other Indo-European languages, too. Hansen and de Haan (2009) provide a comprehensive overview. As Drubig (2001) and Butler (2003) illustrate, modal operators which display an ambiguity between circumstantial and epistemic modality are not restricted to Indo-European languages, but they are also attested in Finnish (*täytyy* 'must', *voi* 'can'), Yoruba (*gbòdó* 'must') and Malay *mesti* 'must', *boleh* (*jadi*) 'may'.⁶³ Finally, van der Auwera et al. (2005, 257) point out that poly-functional modal verbs, which are ambiguous between a circumstantial and an epistemic interpretation are widely attested in Indo-European languages. Moreover, they can be found in languages that are in geographical or cultural proximity of Indo-European languages.

In general, the cross-linguistic data which has been reviewed here is in favour of the analysis developed in Section 5.2, according to which circumstantial modal operators are treated as event modifiers. This conclusion is based on the observation that epistemic modal verbs in many languages tend to modify predications that are incompatible with circumstantial modal verbs. These predications involve predicates that cannot be changed or that refer to an event in the past. As it has been shown by Kratzer (1995, 126) and Maienborn (2003, 106), the first diagnostic leads to the conclusion that these predicates do not involve event arguments. The particularity of epistemic modifiers could be rephrased as the ability to modify predications that lack an event argument. In contrast, circumstantial modal verbs require predicates that can be interpreted as events. As a consequence, circumstantial modal verbs are event modifiers and epistemic modal verbs are propositional modifiers or even speech act modifiers. The particular nature of that latter type remains to be determined.

5.6 Critical data

However, there are different types of examples that seem to contradict an approach that accounts for the ambiguity of modal operators in terms of event modification on the one side and propositional modification on the other side. The next sections provide a couple of examples which are based on modal verbs.

5.6.1 Quantificational modal verbs

According to the analysis developed above, circumstantial modal operators are event modifiers. This assumption is based on the observation that circumstantial modal verbs were not felicitous

⁶³In addition, Butler (2003) discusses the modal affixes *-laam* 'may' *-ñum* 'must' in Tamil. As indicated by Ophira Gamliel (pers. commun.), the situation is far more complex in Tamil and its cognate Malayalam. First of all, Butler (2003) segments the affixes in a wrong way: The modal affix is *aam* rather than *laam*. Moreover, an epistemic interpretation only becomes available if other affixes are involved such as the concessive marker *-aalum*. Thus, it is not clear to which extent the epistemic interpretation is caused by the concessive marker.

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within all the examples discussed so far. However, there are instances of modal verbs that selects a predicate that refers to a state that cannot be changed and which clearly do not exhibit an epistemic interpretation, such as the examples provided by Brennan (1993, 96) in (82) and (83).

(82) A basketball player can be short.

$\exists x [B(x) \wedge S(x)]$

(83) A basketball player will have good eyesight.

$\forall x [B(x) \wedge E(x)]$

Beyond doubt, what is selected by *can* in the examples above is a predicate that denotes an essential property. Yet, the interpretation is by no means an epistemic one. However, these examples can only be interpreted in a circumstantial manner, as long as the subject NP is generic such as an indefinite NP. As soon as the subject here is replaced by a definite NP, an epistemic interpretation will only be available. As demonstrated by Maché (2009, 36), modal operators always seem to have to bind some sort of variable, reminiscent of *Prohibition Against Vacuous Quantification*, as it is proposed by Kratzer (1995, 131). In the canonical case, a circumstantial modal operator binds the variable provided by the event argument of the embedded predicate. However, if the embedded predicate does not involve an event argument in the first place, two scenarios are possible. Either the clause contains another suitable variable such as an indefinite NP, or no such variable is present at all. In the first case, a circumstantial interpretation is still possible. The modal verb binds the variable provided by the indefinite NP obtaining a quantificational interpretation, in the same manner as those cases described in Section 5.3. In the second case, an epistemic reading will be forced. This is typically the case with predicates that select a definite subject NP. This is how the epistemic interpretation can still be maintained, even if the embedded predicate does not contain an event argument, such as in the case of stative predicates that denote essential states.

5.6.2 Intensional subjects

An epistemic interpretation becomes mandatory as soon as a modal operator embeds a proposition that does not contain any variable. As it has been pointed out in the previous section, this is most obviously exemplified in an environment where a modal verb embeds a predication between a predicate that refers to a state that selects and a definite subject NP. However, there are some cases in German in which a circumstantial modal verb most readily occurs with such a predicate and a definite subject (84). An analogous example for English is given by Barbiers (2002, 61) who argues that a modal verb which selects an individual level predicate can be interpreted in a circumstantial way whenever the reference of the subject NP is not identified (86).

(84) Der Bewerber muss polnischer Muttersprachler sein.

the applicant must Polish native.speaker be-INF

‘The applicant has to be a native speaker of Polish.’

- (85) Der Bewerber ist polnischer Muttersprachler.
the applicant is Polish native.speaker
'The applicant is a native speaker of Polish.'
- (86) The new professor must be a native speaker of English

Note, however, that the definite subjects in the examples above behave in a peculiar way. Contrary to canonical definite subjects (85), those embedded under circumstantial modals do not refer to an identified referent. It is even not necessary that there is such an individual at all in the actual world. Accordingly, the subjects exemplified in (84) and 86 behave like NPs in intensional contexts. In contrast, canonical definite subject NPs always refer to a given individual that is identified in the discourse (85). An intensional interpretation, in which the reference is not clearly determined or in which such a referent does not exist at all, is ruled out in these cases. The existence of the referent is presupposed with canonical definite subject NPs.

Again, it is plausible to assume that this sort of intensional subjects introduce some sort of variable. Accordingly, a similar reasoning can apply to an intensional subject as it was exemplified with indefinite subject NPs: there is a further variable available that can be bound by the modal operator. As a consequence, an epistemic interpretation can be circumvented. As a consequence, it seems that a circumstantial interpretation is blocked as soon as the modal operator modifies a predication between a clearly identified individual and a predicate that refers to a state that cannot be changed.

5.6.3 Veronika Ehrich's counter example

There are further examples that seem to refute the analysis outlined above, according to which circumstantial modal operators are event modifiers and according to which circumstantial modal operators are not compatible with stative predicates that refer to states that cannot be changed or with past related complements. As pointed out by Veronika Ehrich (pers. commun.), in some cases, circumstantial modal verbs modify predications between an identified individual and a predicate that refers to a state that cannot be changed (or individual level predicate). Ehrich provided the following example, which undeniably exhibits a circumstantial interpretation.

- (87) Benedikt XVI muss fromm sein.
Benedikt XVI must pious be-INF
'Benedict has to be pious (behave in a pious way)'

At this point, the question arises as to what can be precisely considered as 'individual level predicate'? As Kratzer (1995, 148), Jäger (2001) and Maienborn (2003, 216) point out, the border between individual level predicates and stage level predicates is rather blurry; there are certain mechanism that can turn a stative predicate that lacks an event argument into a stative predicate that involves such an event argument. In Kratzer's terms, an individual level predicate can be changed into a stage level predicate under particular conditions. In a more explicit manner, Maienborn (2003, 216) discusses two specific mechanisms by means of which a stative predicate that usually lacks an event argument can obtain one: the Temporariness Effect and the Agentivity Effect. Whereas the first causes a stative predicate to be interpreted as a temporally clearly bounded state, the latter provides an interpretation where the stative predicate is

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construed as activity, like in agentive *be*-readings. These mechanism of reinterpretation can be easily applied as long it is conceivable to dissociate the subject referent from the property expressed by the predicate. In the case of *pious*, it is possible to imagine that Benedikt XVI could give up his piety under certain conditions. Accordingly, agentive *be* interpretation is possible for the copula *sein* in example (87). However, the tighter the property is associated with the subject referent, the less likely it becomes that these mechanisms of reinterpretation will succeed.

- (88) Benedikt XVI muss ein Deutscher sein.
Benedikt XVI must a German be-INF
Intended reading: ‘Benedict is obliged to be a German (behave like a German/become a German)’ (circumstantial)
Preferred: ‘Benedict must be a German (behave like a German/become a German)’ (epistemic)
- (89) Benedikt XVI muss ein Mann sein.
Benedikt XVI must a man be-INF
Intended reading: ‘Benedict is obliged to be a man (behave like a man/become a man)’ (circumstantial)
Preferred: ‘Benedict must be a man (behave like a man/become a man)’ (epistemic)
- (90) Benedikt XVI muss am 16. April 1927 geboren worden sein.
Benedikt XVI must at 16 April 1927 born PAS.AUX.PST be-INF
Intended reading: ‘Benedict is obliged to be born on the 16th April’ (circumstantial)
Preferred: ‘Benedict must be born on the 16th April’ (epistemic)

Nationalities can be changed, though it is not very likely to happen. The sex of an individual is even less likely to change. Finally, the date of birth will always remain the same. Correspondingly, the examples (88)–(90) decrease in their appropriateness for an circumstantial interpretation. Since the date of birth is a property that cannot be dissociated from the subject, the pattern in (90) is restricted to an epistemic interpretation.

At the point, it becomes possible to provide a clearer definition of what is called ‘individual level predicate’ here. In fact, the term ‘individual level predicate’ does not refer to a homogeneous class of stative predicates. Most predicates can be reinterpreted as elements that denote temporally bounded states or even activities. An ideal individual level predicate expresses a property that cannot be dissociated from its subject referent. As it seems, there are very few predicates of this type. Nevertheless, it has turned out in this section that predicates that denote a property that cannot be dissociated from its subject referent are restricted to an epistemic interpretation if they are embedded by a modal operator.⁶⁴

Summing up, it has been demonstrated here that all the apparent counter-examples do not contradict the generalisations elaborated in the previous sections. As a consequence, the analysis presented so far need not be rejected.

⁶⁴As Martin Schäfer (pers. commun.) has pointed out, there is an additional way to capture the distinction between stage level predicate and individual level predicate in terms of agent control, based on theories elaborated by Dik (1975) and Geuder (2006). It seems to be fruitful to pursue such an approach.

5.6.4 Summary

In the previous sections, it has been shown that the ambiguity of modal operators and related phenomena can be explained in terms of event modification. It has turned out that epistemic modal operators can modify predications between an identified individual and a predicate that refers to a state that cannot be changed or a predicate that refers to some past event. In contrast, circumstantial modal verbs fail to embed such a predication. As Kratzer (1995, 126) and Maienborn (2003, 106) have demonstrated, these predicates can most efficiently be described as predicates that lack an event argument. In other words, circumstantial modal operators are not compatible with predicates that lack an event argument; they are restricted to predicates that provide an event argument. These facts could be an indicator that circumstantial modal verbs are event modifiers. A similar observation has been made by Colomo (2011, 63, 66).

This analysis is corroborated by data from several languages. Moreover, it gains additional support from the behaviour of related types of ambiguous modifiers. In the preceding sections, it has been demonstrated that certain modifiers such as causal clauses, conditional clauses, temporal clauses, manner adverbs, locative adverbials and others impose selectional restrictions in their canonical interpretation regarding the event which is provided by the modified predicate. The type of restriction may differ and can concern the temporal situation of the event, involvement of an agent which is in intentional control of the event. However, they can alternatively be used to modify propositions or speech acts. In this interpretation, the selectional restrictions are no longer active.

Generally speaking, modal verbs and a group of related modifiers are ambiguous between two interpretations. In their, canonical, non-epistemic interpretation they are event modifiers which impose selectional restrictions on the specification of the event which is provided by the matrix predicate. In contrast, they modify more complex entities in their non-canonical or epistemic interpretation. In these interpretation, the selectional restrictions regarding the event type are dropped. At this point, the precise nature of the modified entity remains unclear. There are circumstances in favour of the assumption that the non-canonical interpretations modify propositions, and there is evidence that they are speech acts. The following section will undertake an attempt to shed light on this issue. It is dedicated to the environments in which epistemic operators are excluded.

Finally, this section has not addressed the question if and how a distinction between ‘objective’ or ‘subjective’ epistemic interpretation should be made. The advantages and disadvantages of such a venture will be carefully taken into consideration in the ensuing section.

6 Twenty one commandments for epistemic modality

After having discussed environments in which circumstantial modal verbs are ruled out and epistemic modal verbs are only possible, the upcoming section is dedicated to contexts from which epistemic modal verbs are said to be excluded. In the past decades, a lot of contexts have been suggested that are argued to be incompatible with epistemic modal verbs. However, most of them have never been checked against broad empirical data. Thus, the theoretical status of these claims is rather unclear. The main contribution of this section is to provide a thorough investigation of the twenty one most intensively discussed distributions in which epistemic modal verbs are claimed to be ruled out. Based on German data from the DeReKo corpus, a major aspect of this investigation will be to carefully check to which extent epistemic modal verbs really do not occur in these environments.

Why do these non-canonical environments play such an important role in the discussion about the nature of epistemic modification? Considering these configurations, the question arises as to why the epistemic modal verb cannot be interpreted in the particular environment. If one compares this non-canonical environment with an environment in which the respective epistemic modal verb canonically occurs, one might find an essential difference between the two environments. This “difference” can be some operator or element that takes scope over the epistemic modal verb. In the case that the unacceptability of the epistemic modal verb correlates with the presence of that operator, further conclusions can be made about the precise position or function of epistemic modifiers in the architecture of the utterance.

An essential question that arises at this point concerns the precise position of epistemic operators with respect to the proposition: Are epistemic modifiers part of the proposition or do they occupy a position external to the proposition? Lyons (1977, 799) assumes that epistemic modal verbs are external to the proposition as he considers that epistemically modified utterances are not acts of telling and that they involve an illocutionary force similar to questions. As Lyons (1977, 799, 804, 805) acknowledges, epistemic modal verbs sometimes occur in the distributions that cannot be outside of the proposition. As a consequence, Lyons (1977, 803) differentiates between two types of epistemic modifiers: ‘subjective’ and ‘objective’ epistemic modal operators, whereas the first is external to the proposition and the latter is part of the proposition. From his assumptions, it follows that subjective epistemic operator should compete for the same position as assertion operators, question operators, or imperative operators.

Likewise, Kiefer (1984, 72) concludes that ‘subjective’ epistemic modal verbs being attitudinal operators are external to the proposition, whereas ‘objective’ epistemic modal verbs are part of the proposition. Analogously, Huitink (2008, 10) assumes that ‘subjective’ epistemic operators are speech act modifiers, as they do not contribute to the truth conditions of a sentence. Furthermore, she concludes that ‘objective’ epistemic modal verbs are a part of the propositional

content. In a similar vein, Drubig (2001, 14) argues that epistemic modal operators are subject to the non-assertive restriction: as he concludes, they are interpreted outside of the proposition at LF. Since speech act operators only affect the proposition, Drubig (2001) expects that epistemic modal verbs should never be in the scope of a question operator or directive operator. Cohen (2010) develops a similar perspective.

In contrast to these perspectives, there are authors who conclude that epistemic modal verbs are always part of the proposition, regardless of whether they are considered as ‘subjective’ or ‘objective’. As Papafragou (2006, 1693) demonstrates, ‘subjective’ epistemic modal verbs contribute to the truth conditions. Thus they should be part of the proposition. Moreover, she shows that they occur in environments in which they are in the scope of modifiers that are part of the proposition. In a similar vein, Zimmermann (2004, 263) concludes that epistemic *müssen* is part of the proposition, as it can occur in the scope of a negation. A similar observation has been made by Krämer (2005, 49) for German *müssen* and *können*.

Another question that comes up in this discussion regards the syntactic category of epistemic modal verbs. Some authors such as Abraham (2001, 21), Wurmbrand (2001, 184) and Erb (2001, 102) argue that epistemic modal verbs in German do not occur in non-finite environments. Based on this assumption, they conclude that they differ in crucial aspects from canonical lexical verbs and that they must be functional elements rather than lexical verbs.

This section will discuss a comprehensive corpus based survey of the twenty one environments in which epistemic modal verbs have been claimed to be excluded. However, as it turns out, most of these distributions do host epistemic modal verbs. The only configurations in which epistemic modal operators actually seem to be ruled out involve (i) directional phrase complements, (ii) *wh*-clefts, (iii) nominalisations, (iv) adverbial infinitives and (v) modal verbs that are embedded under a volitional modal operator such as circumstantial modal verbs, predicates of desire, imperatives and optatives. Moreover, event related conditionals and temporal *wenn*-clauses appear to be further promising candidates that do not tolerate epistemic modal operators. These conclusions are very similar to the ones drawn by Eide (2005, 9).

What consequences do these results imply? First of all, it has to be accounted for why epistemic modal verbs are not compatible with these four distributions and why they are only acceptable under particular conditions in the remaining environments. It is not obvious that the difference in the acceptability is caused by the same criterion in each of the environments reviewed here. As it will be shown here, the efficient explanation is based on the conditions of how the epistemic operator is anchored. Epistemic operators always need to be evaluated with respect to a clearly identified attitude holder. In the most canonical case, this attitude holder is identical to the speaker of the actual utterance. As it will be shown the Sections 6.1, 6.11, 6.12 and 6.15, there are cases in which a context shift applies the attitude holder is not anchored to a referent other than the speaker. Accordingly, it is more efficient to identify the attitude holder with a more abstract concept such as the *deictic centre*, which has originally been introduced by Fillmore (1997, 98) in the early seventies and which has subsequently been elaborated in more detail by Levinson (1983, 64). It is reminiscent of the *Origo* as it has been conceived by Bühler (1934, 102).

Based on these assumptions, it is plausible to assume that epistemic operators introduce a variable for the deictic centre which remains to be instantiated. It is the aim of the present study to investigate the precise mechanisms of this anchoring. As it seems, the variable for the deictic

centre has to be anchored to the most local appropriate epistemic agent. In the case in which there is an intervening operator, the configuration can become uninterpretable. The distributions (i) and (ii) seem to violate the selectional restrictions imposed by the epistemic operator.

Furthermore, it will be demonstrated that any approach that regards epistemic modal verbs as distinct functional categories faces serious challenges: it will have to account for why epistemic modal verbs in languages such as German behave in many respect more like lexical verbs than is expected at the first glance.

Likewise, it turns out that the distinction between an ‘objective’ and a ‘subjective’ epistemic modality is misleading, as it creates more problems than it solves. First of all, the examples that are considered as ‘objective’ epistemic modal verbs do not constitute a consistent class. Quite a lot of the essential characteristics that have been proposed only hold for single epistemic modal verbs rather than for all of the verbs that are regarded as ‘objective’ epistemic: there are only two epistemic modal verbs that are attested in the scope of a quantifying expression such as *jeder* ‘every, any’: the possibility modal verbs *können* and *könnte*. The only epistemic modal verbs that occur in *wh*-questions are *könnte*, *dürfte* and *kann*, and a negation can only take scope over epistemic *können* and *müssen* without any restraint. Secondly, most of the ‘objective’ epistemic modal verbs turn out to involve no epistemicity at all and can more efficiently be captured as practical possibility, practical necessity or quantificational modal verbs. Thirdly, the remaining ‘objective’ epistemic modal verbs are evaluated with respect to a clearly determined deictic centre and behave exactly like ‘subject’ epistemic modal verbs do. Thus, there is no reason to regard these remaining cases as a distinct category.

Finally, the question as to whether epistemic operators are internal or external to the proposition will not be fully solved here. Much of the data presented in this section seems rather to be in favour of an account that suggests that epistemic operators are part of the proposition, supporting the analysis elaborated by Papafragou (2006, 1693): they occur in the scope of a negation and in adverbial clauses. In a similar fashion, Krämer (2005, 49) argues that the epistemic modal verbs *können* and *müssen* have to be part of the proposition as they can occur in the scope of a negation, of a question and they can bear verum focus. However, epistemic modal verbs appear to interact with elements that are external to the proposition. In particular, they occur in polarity and *wh*-questions that yield the same interpretation like questions that contain the epistemic particle *wohl*. As Zimmermann (2004, 263) argues, the epistemic operator contributed by *wohl* cannot be a part of the proposition in these questions. Being an operator that determines the speaker’s (or the hearer’s) commitment to the proposition, a Hamblin-Style analysis of questions would only yield the correct interpretation if the operator is outside the proposition. In short, the situation remains paradoxical: epistemic modifiers seem to be a part of the proposition and truth functional on one hand and, on the other, they can interact with speech act operators. In order to solve this issue, it is not only necessary to develop an analysis for epistemic operators but also to provide an elaborate perspective on speech act and illocutionary operators. As it has been noticed on various occasions, an utterance can involve more than one of these operators. Zimmermann (2004, 273) shows that an ASSERT and a ? operator can take scope over an operator that determines the propositional commitment of the speaker or the hearer. In a similar fashion, Reis (2003, 192) considers approaches as plausible that derive the interpretation of German *wh*-root-infinitives from their directive counterparts. Pursuing this reasoning, this would result in a configuration in which a *wh*-operator takes scope over a directive

speech act, hence a configuration that involves more than one illocutionary operator.

The corpus study presented in the upcoming sections is based on the DeReKo corpus for German. It was carried out in 2011 at a time when it encompassed by and large 2 billion word form tokens. Occasionally, the exploited data will be supplemented by examples from other sources. As this study was focussed on epistemic modal verbs, the following items were considered: *kann*, *könnte*, *muss*, *müsste*, *dürfte*, *sollte*, *mag*, *wird* and *braucht*. Since the latter is a negative polar item and only occurs in distributions with negation, an additional logical operator that can cause complication, it has not been considered in all of the investigations. Moreover, it has already been demonstrated in Section 4.2.9 that its epistemic uses are almost absent from the corpus.

6.1 No infinitives

Askedal (1997b, 13; 1998, 60), Zifonun (1997, 1268), Wurmbrand (2001, 184) and Abraham (2001, 21; 2002, 27; 2005, 246) argue that in German the epistemic uses of the six traditional modal verbs being genuine auxiliaries lack infinitive forms, cf. the example given by Zifonun.

- (1) Er wird nicht mehr ganz nüchtern sein können
 he FUT.AUX NEG more entirely sober be-INF can-INF
 # Epistemic: He not possibly have been entirely sober anymore“

Erb (2001, 102) stresses that the lack of infinitive epistemic modal verbs seems to be a peculiarity of German to infinitive, since in other languages such as Dutch and Danish, they exist, as it has been pointed out by Thráinsson and Vikner (1995, 76).¹ In a similar fashion, Eide (2005, 393) provides examples for epistemic modal verbs in Norwegian being embedded as an infinitive complement (*måtte* ‘must’, *kunne* ‘may’, *burde* ‘ought-to’ and *ville* ‘will’). According to Erb’s claim, it should be impossible to embed epistemic modal verbs in non-finite environments in German. Yet, even in German, infinitives of epistemic modal verbs are attested in corpora, at least in the case of *können* (2)–(4) and *müssen* (5). This indicates that examples such as the one constructed by Reis (2001, 295) (6) do indeed occur naturally. The remaining modal verbs could not be attested for various reasons. First of all, *dürfen* and *sollen* can be construed in an epistemic manner in their subjunctive past forms. Since infinitives in German cannot be specified for mood, they do not fulfil the prerequisite for an epistemic interpretation for *dürfen* and *sollen*. Secondly, *werden* does not involve non-finite forms in its use as a future auxiliary from which the epistemic interpretation is derived. Finally, epistemic *mögen* could not be found at all as a part of a *zu*-infinitive complement in the DeReKo corpus, which might be due to its generally low frequency and archaic nature.²

¹According to the view entertained here, it is far from evident whether the alleged examples with non-finite epistemic modal verbs indeed involve epistemicity. Thráinsson and Vikner (1995) wonder why *kunne* is the only epistemic modal verb in Danish that can be embedded. As it has been shown above, in the case of *können* in German it is almost impossible to decide whether it is interpreted as a practical or epistemic possibility. Hence, the use of *kunne* under discussion could equally be interpreted as a practical possibility reading or quantification over events.

²The underlying query was *haben zu mögen* and *sein zu mögen*. Since epistemic modal verbs predomi-

- (2) Sie stehen nun unter Verdacht, das Feuer selbst gelegt haben zu können.³
 they stand now under suspicion the fire self set-PPP have-INF to can-INF
 ‘They are suspected to have (possibly) set the fire themselves.’
- (3) einer der Hauptverdächtigen in der weltweiten Suche nach den Urhebern
 on the-GEN primary.suspects-GEN in the world.wide search for the authors
 des „ILOVEYOU“- Computervirus hat eingeräumt, die verheerende E-Mail
 the-GEN ILOVEYOU computer.virus has conceded the devastating email
 möglicherweise „versehentlich“ gesendet haben zu können.⁴
 possibly accidentally send-PPP have-INF to can-INF
 ‘One of the primary suspects in the world wide search for the authors of the ILOVEYOU computer virus has conceded that he could possibly have sent the devastating e-mail by accident.’
- (4) Er befürchtet zugleich, Vater werden und sich mit Aids infiziert
 He worries at.the.same.time father become and self with AIDS infect-PPP
 haben zu können.⁵
 have-INF to can-INF
 ‘He is worried that he may become father and that he may have contracted AIDS at the same time.’
- (5) Die einzige englischsprachige Krankenschwester meinte immer wieder, mich falsch
 the only English-speaking nurse opined always again me wrong
 verstanden haben zu müssen.⁶
 understand-PPP have-INF to must-INF
 ‘The only English nurse opined over and over that she must have got me wrong.’
- (6) Der Verdacht, sich täuschen zu müssen, drängte sich mir auf.
 the suspicion REFL err-INF to must-INF impose REFL me on
 ‘The suspicion that I must have been wrong became obvious to me.’

Crucially, all these examples involve a context shift. Whereas in the most frequent cases the epistemic modal verb is evaluated with respect to the speaker, this does not hold for the examples above. Therefore, it becomes necessary to differentiate between the speaker referent and the referent that undertakes the evaluation. For the sake of clarity, the latter will be referred to as ‘deictic centre’ in the remainder. This is on par with Abraham (2005, 263), who argued for the need to syntactically represent the modal source as being a part of the argument structure of epistemic and circumstantial modal verbs. As the examples above indicate, epistemic modal verbs can occur in non-finite environments if they are embedded by a predicate that expresses an attitude. Crucially, these predicates introduce an argument that is specified as the attitude

nantly occur with stative complements, it is expected that potential epistemic instances of *mögen* should be very likely to occur with one of these highly frequent stative predicates as well. In a similar spirit, Raynaud (1977, 22) has found out that in her corpus 90 % of the epistemic modal verbs selected the stative verb *sein* as its complement. However, if it does not it is very doubtful whether *mögen* can be attested in such contexts at all.

³DeReKo: BRZ09/OKT.10939 Braunschweiger Zeitung, 24.10. 2009.

⁴DeReKo: K00/MAI.37742 Kleine Zeitung, 12.05. 2000.

⁵DeReKo: RHZ07/JAN.21226 Rhein-Zeitung, 24.01. 2007.

⁶DeReKo: HAZ07/NOV.04660 Hannoversche Allgemeine, 17.11. 2007.

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holder. In all the instances of non-finite epistemic modal verbs considered so far, the deictic centre is anchored to that argument that is specified as the attitude holder or epistemic agent. Accordingly, the deictic centre is identified with the subject referent in (3), (4) and (5), or the unexpressed argument of the noun *Verdacht* ‘suspicion’ in (2) and (6). As it will be demonstrated in much detail in Section 6.15, epistemic modal verbs that are embedded in finite complement clauses embedded under non-factive predicates behave in an analogous manner.

As Reis (2001, 296) stresses, instances such as (6) do indeed involve a ‘subjective’ epistemic interpretation rather than an alethic or ‘objective’ epistemic one, because they clearly specify a deictic centre: the matrix subject, cf. Mortelmans et al. (2009, 34) for a similar conclusion.

As a consequence, epistemic modal verbs only occur in non-finite environments if they are embedded under a predicate that expresses an attitude and syntactically specifies an argument as the holder of the respective attitude. Otherwise, the identification of the deictic centre fails. As expected, no instances could be found in adverbial infinitives that are headed by *um zu*, *ohne zu* or *anstatt zu*. These contexts do not specify a holder of an attitude. This is why the CoDeC as it is stated in Section 4.1.3 needs to be formulated with respect to the deictic centre rather than the speaker: as an epistemic operator that occurs embedded under particular predicates can be evaluated with respect to an appropriate referent other than the speaker.

However, there are occurrences of non-finite modal verbs that are not embedded by attitude predicates and nevertheless involve an interpretation that could be epistemic. In example (7), *müssen* is embedded by the future auxiliary *werden*. Since it is a subject-to-subject raising verb, no context shift is induced here.

- (7) sie werden ihn in Leipzig oft genug müssen gesehen haben, den bösen buben⁷
they will him in Leipzig often enough must-INF see-PPP INF the bad boy
‘They must have had to see him often enough in Leipzig, the brat.’

Even if the modal verb embeds a past related infinitive complement, it is not evident that this instance indeed has to be interpreted in an epistemic manner. Alternatively, here, it is conceivable that *müssen* expresses the physical necessity that nobody could escape from seeing the brat, it is reflected in the gloss given below.⁸ If this is indeed the appropriate interpretation, it remains mysterious as to why *müssen* takes scope over the perfect auxiliary *haben*.

Authors such as Cinque (1999, 87), Eide (2005, 9) and Colomo (2011, 111) argue that epistemic modal verbs cannot be embedded by circumstantial modal verbs. This observation can be derived from the conditions on embedding of non-finite epistemic modal verbs. As it has been demonstrated above, epistemic modal verbs can occur in non-finite contexts but they are subject to severe restrictions. Since they introduce a variable for a deictic centre, this variable needs to be instantiated. In order to be successfully anchored, a deictic centre requires an attitude holder that is syntactically realised in the local environment, eg. as an argument of the embedding attitude verb. If no such argument is present, the instantiation fails. As it seems, circumstantial modal verbs do not introduce an appropriate argument that could be identified with the deictic centre. Thus, no interpretation can be obtained.

⁷Jakob Michael Reinhold Lenz, *Der Hofmeister*, V.7 (1774).

⁸This interpretation of *müssen* can be found in examples such as the one below which is clearly circumstantial:

6.2 No past participle

Furthermore, it is argued that due to their auxiliary-like nature epistemic modal verbs lack independent past participles, as it has been argued by Griesbach and Schulz (1976, 84), Zifonun (1997, 1269), Askedal (1997b, 13), Erb (2001, 103), Abraham, 13 (2001, 13; 2002, 27, 2005, 246), Helbig and Buscha (2001, 121) and Wurmbrand (2001, 184). In a similar fashion, Fagan (2001, 200) argues that modal verbs that are embedded by the perfect tense auxiliary *haben* cannot be interpreted in an epistemic manner. As already shown in Section 4.1.1, the past participles of the six traditional modal auxiliaries are usually being realised as IPP. According to the authors here, these can only be circumstantially interpreted, as it is illustrated in the example given by Zifonun.⁹

- (8) Er hat/hatte nicht mehr ganz nüchtern sein können.
 He PRF.AUX/PRF.AUX.PST NEG more entirely sober be-INF can-PPP(ipp)
 # Epistemic: 'He cannot have been entirely sober anymore'

However, there are different environments in which past participles of epistemic modal verbs can neatly be employed. In particular, this concerns modal verbs that are embedded by the perfect auxiliary *haben* being marked for the past subjunctive. As it has been illustrated by Kasper (1987, 26), in German, the use of subjunctive of the past in declarative root clauses signals that the speaker is not in the position to felicitously assert the truth of the proposition, roughly speaking, it indicates counter-factuality. Similar perspectives have been elaborated by Eisenberg (2004, 117) and Eisenberg et al. (2005, 523). In contrast, the past subjunctive can serve as an optional marker of indirect speech in complements of non-factive predicates, as it is illustrated in Eisenberg et al. (2005, 538) and Eisenberg (2004, 120). Whenever it is embedded by the perfect auxiliary *haben* with past subjunctive morphology that indicates an indirect speech, an epistemic interpretation is straightforward, cf. (9):

- (9) Der Angeklagte wartete vor dem Altenkirchener Amtsgericht schnell mit
 the accused waited in.front.of the Altenkirchen-ADJ local.court quickly with
 einer Gegenthese auf, nach welcher einer der Streithähne ebenfalls die
 a counter.assumption after which one of the wranglers also the
 Wagen hätte beschädigt haben können.¹⁰
 car have-SBJ.PST damage-PPP have-INF can-PPP(ipp)
 'In the Local Court of Altenkirchen, the accused quickly came up with an alternative explanation according to which one of the wranglers could also have damaged the car'

- (i) Fast neun Jahre habt ihr mich ertragen müssen.
 almost nine years have you me endure-INF must-PPP(ipp)
 'You had to endure me for nine years.'

DeReKo: NON09/SEP.15338 Niederösterreichische Nachrichten, 23.09.2009.

¹⁰DeReKo: RHZ07/NOV.21178 Rhein-Zeitung, 22.11. 2007.

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Again, this example involves a context shift: the deictic centre is not the speaker but the subject referent of the matrix clause. Reis (2001, 295) demonstrates that the past participles of *können* and *müssen* epistemic interpretation are moreover possible in counter-factual/irreal conditional contexts as well, cf. (10) and (11). As the examples (12)–(15) illustrate, these patterns are also attested in corpora. However, Erb (2001, 104) assumes that the epistemicity is contributed by the subjunctive marking on the perfect auxiliary *haben* (*hätte*).

- (10) Nach allem, was ich weiß, hätte er da noch in Prag sein
 According everything that I know have-SBJV.PST he there still in Prague be
 können.
 can-PPP(ipp)
 ‘As far as I know, he could have been in Prague.’
- (11) Nach allem, was ich weiß, hätte er dann zu Hause sein
 According everything that I know have-SBJV.PST he then at home be-INF
 müssen.
 must-PPP(ipp)
 ‘As far as I know, he must have been at home in that case.’
- (12) Die Indizien liessen keinen zweifelsfreien Schluss auf die Täterschaft zu; es
 the evidence let no doubt.less conclusion about the delinquent to it
 hätte durchaus auch jemand völlig anders die tödlichen Schüsse
 have-SBJV.PST thoroughly also somebody completely else the lethal bullets
 abgegeben haben können¹¹
 shot-PPP have-INF can-PPP(ipp)
 ‘There was no compelling evidence about the delinquent it could have been that somebody
 completely different has shot the lethal bullets.’
- (13) Wie der Polizist sagte, hätten die Spuren – wenn die Angaben
 as the policeman said have-SBJV.PST the traces if the information
 des jungen Mannes stimmen sollten – nach dem Regen am Abend
 the-GEN young-GEN man-GEN hold should after the rain on.the evening
 verwischt sein müssen.¹²
 cover-PPP be-INF must-PPP(ipp)
 ‘As the policeman said, the tracks should have been covered by the rain that went down the
 other evening if the information of that young man was indeed right.’
- (14) Ein Schweizer Gerichtsmediziner kam zum Schluss, dass das Opfer bei einem
 A Swiss forensic.doctor came to.the conclusion that the victim at a
 so hohen Alkoholpegel bewusstlos hätte sein müssen.¹³
 such high alcohol.level unconscious have-SBJV.PST be-INF must-PPP(ipp)
 ‘A Swiss forensic doctor came to the conclusion that the victim should have lost consciousness
 from having such a high alcohol level.’

¹¹DeReKo: SOZ06/SEP.03999 Die Südostschweiz, 20.09. 2006.

¹²DeReKo: RHZ09/JAN.18631 Rhein-Zeitung, 26.01. 2009.

¹³DeReKo: A10/JAN.06246 St. Galler Tagblatt, 26.01. 2010.

- (15) Wäre es ein Meteor gewesen, dann hätte er von Überschallknall
 be-SBJV.PST it a meteor be-PPP then have-SBJV.PST he by supersonics
 und Druckwellen begleitet sein müssen, die im weiten
 and blast.waves accompany-PPP be-INF must-PPP(ipp) REL.PRN in.the wide
 Umkreis Fenster zerbrochen hätten.¹⁴
 radius windows smash-PPP have-SBJV.PST
 'If it had been a meteor it should have been accompanied by supersonics and blast waves that
 would have broken the windows within a considerable radius'

Similar examples have been discussed by Jędrzejowski (2010, 44). As Reis (2001, 296) has illustrated, these examples indeed involve 'subjective' epistemic modality rather than alethic or objective epistemic since they involve a clearly defined deictic centre, which is in most of the cases above instantiated by the matrix subject referent or the speaker in (12) and (15). At this point the question arises what precisely the counter-factual operator affects. What is marked as irrealis or counter factual in (10)–(15) is the epistemic commitment: if some particular conditions were fulfilled, the speaker would consider it possible or necessary that the state of affairs expressed by the proposition holds. Arguably, the speaker signals in these examples that the modal base which corresponds to his knowledge does not contain a particular set of propositions under discussion in the current discourse. But if his modal base would comprise them, he would come to the conclusion expressed by the epistemic modal verb. If the young man's information in example (13) was indeed part of the policeman's knowledge and beliefs, he would conclude that they must have been covered by the rain. That the subjunctive operator interacts with the discourse structure has already been illustrated by Kasper (1987, 24 ff.).

Eide (2005, 395) provides similar examples for the Norwegian epistemic modal verbs *måtte* 'must' and *kunne* 'may' being embedded as past participles in counter-factual environments. Likewise, Barbiers (1995, 198, Fn. 42) discusses an epistemic instance of Dutch *moeten* with IPP morphology.

It is fairly doubtful as to whether it is possible in Contemporary German to embed epistemic *können* under a perfect auxiliary that is inflected for indicative. Interestingly, this pattern exists in a typological perspective. They are the unmarked ways of expressing assumptions about some past events in French and Spanish, as it is shown by Demirdache and Uribe-Etxebarria (2008, 1809) and Hacquard (2006, 25, 44, 155). The most intriguing aspect of this phenomenon is that these patterns involve an inverse scope of tense operator and modal operator, as illustrated in the examples given by Hacquard (2006, 25,44) (16),(17) and Demirdache and Uribe-Etxebarria (2008, 1809) (18):

- (16) Bingley a pu parler à Jane.
 Bingley has can-PPP speak-INF to Jane
 'Given J.'s circumstances then, she managed to speak to Jane.' (circumstantial)
 'Given my evidence now, it could be the case that Bingley did then speak to Jane.' (epis-
 temic)

¹⁴DeReKo: SPK/J98.00108 spektrumdirekt, 01.03. 1998.

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- (17) Jane a dû prendre le train.
 Jane has must-PPP take-INF the train
 ‘Given J.’s circumstances then, she had to take the train then.’ (circumstantial)
 ‘Given my evidence now, it must be the case that Jane did then take the train.’ (epistemic)
- (18) Pedro ha debido ganar la carrera.
 Pedro has must-PPP win-INF the race
 ‘Pedro must have won the race.’ (epistemic)

It merits closer attention that this pattern was diachronically possible in German as well. Example (19) is taken from the play *Agrippina* written by the Silesian playwright Daniel Casper von Lohenstein.¹⁵ In an argument with her son, Agrippina wonders how she could have given birth to a child that is so unlike her.

- (19) Ein Tiger hat mit mir sich muessen gatten // Daß dieser Leib solch
 a tiger has with me himself must-PPP(ipp) copulate-INF that this body such
 einen Wurm gebahr.¹⁶
 a worm bore
 ‘A tiger must have mated with me as this body has given birth to such a worm.’

Similar patterns can be found with *brauchen* up to the late 19th century. Interestingly, *brauchen* is not morphologically realised as IPP in these examples but rather as *ge*-participle.

- (20) Es läßt sich als ausgemacht annehmen, daß die edleren Obstsorten, welche
 it let REFL as agreed assume-INF that the precious fruits which
 niemals wild wachsend gefunden, sondern allezeit unter menschlicher Wartung
 never wild growing found but always under human attention
 und Pflege erzeugt werden von einer gemeinen und wilden Mutter herstammen,
 and care produced are from a common and feral mother stem
 welche nachmals durch die Länge der Zeit, mit Hülfe menschlichen
 which later through the length the-GEN time-GEN with help human-GEN
 Nachdenkens, Kunst und Fleißes, ihre Zucht veredelt und an Figur,
 reasoning-GEN, art-GEN and effort-GEN their growth cultivated and on shape
 Farbe, Geschmack, Geruch und Größe verändert hat. Dieser Mutterbaum, obgleich
 colour taste smell and size changed has this mother.tree, even.if
 wild, hat doch, wenn er unter einem milden Luftstriche stand, nicht so herbe und
 feral has yet if he under a mild air.flow stood NEG so harsh and
 widrig zu seyn gebraucht, wie die Aepfel, welche unsre nordischen
 contrarious to be-INF need-PPP(ge) as the apples which our Nordic
 Waelder erzeugen.¹⁷
 forests produce

¹⁵The rather unexpected alignment of the epistemic modal verb and its complement could be due reasons of meter and rhyme.

¹⁶Daniel Casper von Lohenstein, *Agrippina*, V, 403. (1666).

'It is commonly assumed that the fruit trees which have never been found feral in nature but which were always produced under human attention and care originate from a common and feral mother. Consecutively, they have been cultivated and their growth has been supported by human reasoning, art and effort. Thus, they changed their shape, colour, taste, smell and size. This mother tree does not need to have been as harsh and contrarious as the apples that grow in our Nordic forests.'

- (21) Aber es wird nun ein Mahl als ausgemacht angenommen, das Ganze,
 But it PASS.AUX now a time as agreed assumed the ensemble
 woraus die sogenannten Fragmente sind, habe nur ein einziges
 where.from the so-called fragments are have-SBJV.PRS only a single
 Buch betragen, und zwar habe es kein Größeres zu seyn gebraucht,
 book amount and indeed have-SBJV.PRS it no bigger to INF need-PPP(ge)
 als das zweyte Buch von Gajus.¹⁸
 as the second book by Gajus

'It is taken to be granted that the ensemble from which the so-called fragments originate only made up a single book and it does not need to have been more voluminous than Gajus' second book.'

Even if this pattern was grammatical in earlier stages of German, this does not entail that it should be considered as grammatical for Contemporary German. Rather, the examples (19)–(21) are hardly acceptable for any native speaker of present day German.

6.3 No past tense

In her corpus based study Coates (1983, 241) demonstrated that English modal auxiliaries with epistemic interpretations never occur in the scope of a past tense operator. In a similar vein, Hengeveld (1988, 237) assumes, based on observations from Spanish, that 'subjective' epistemic modal verbs are bound to the moment of speaking and thus excluded from any past context. As for German, Zifonun (1997, 1269), Axel (2001, 45), Reis (2001, 291), Erb (2001, 98) and Colomo (2011, 111) hold the view that epistemic modal verbs are incompatible with 'referential' past tense, cf. the examples given by Erb (2001).

- (22) Sie mußte also zu Hause sein.
 she must-PST therefore at home be-INF
 '# Epistemic: '(I assumed then that) It was necessarily the case that she was at home.'
- (23) Da wußte sie, daß ihre Mitbewohner im Theater sein mußten.
 then know-PST she that their roommates in.the theatre be-INF must-PST
 'Then she knew that her roommates must have been in the theatre.'

¹⁷Peter Jonas Bergius *Von Obstgärten und deren Beförderung in Schweden* Leipzig: Gräffische Buchhandlung, p. 40, (1794).

¹⁸Gustav Hugo *Beyträge zur civilistischen Bücherkenntnis der letzten vierzig Jahre* Berlin: August Mylius, p. 646, (1829).

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As these authors stress, under specific conditions, utterances such as in (22) can have an epistemic interpretation. In these cases, however, the past tense morpheme is not interpreted as referential tense. Erb (2001, 101, 118, 122) argues that these epistemic modal verbs with past morphology do not qualify the epistemic state of the speaker but that of the matrix subject or even some third pragmatically salient party. A similar observation has been made by Diewald (1999, 263 Fn. 13). Again, these patterns involve a specific type of context shift. In particular, they involve a deictic centre that has made some epistemic judgement in the past, such as illustrated in (23) in more detail.

In order to understand more clearly the interaction of time and modality, it is fruitful to consider the model of temporal interpretation elaborated by Klein (1994, 3). According to his perspective, each utterance involves three types of time intervals: Time of Utterance, which is the time interval when the speaker performs the speech act, Topic Time, which encompasses the time interval the speaker talks about (past/present/future) and Time of Situation, which corresponds to the time interval during which the situation happens. Arguably, epistemic operators introduce a fourth time interval: Time of Evaluation which corresponds to the time interval in which the deictic centre evaluates the proposition with respect to his knowledge. Similar considerations have been made by Homer (2010, Sect. 2.1) and Martin (2011, Sect. 1). In the canonical case, the Time of Evaluation coincides with the Time of Utterance. This Time of Evaluation is closely linked to the *speech act event* (event of evaluation), as it has been suggested by Hacquard (2006, 138). According to her view, epistemic operators are keyed to the speech act event of the utterance.

The past operator can in principle affect two intervals: either Topic Time, the time interval that is talked about resulting in a *past event reading*, or the Time of Evaluation yielding a *past speech event reading*. The latter type of interpretation is the one typically found in indirect reported speech. It often additionally involves the shift of the deictic centre to a salient third party. What Erb (2001) considers as the referential past tense of an epistemic modal verb obviously corresponds to the *past event reading*.

The *past speech event reading* is reminiscent of the behaviour of reportative modal verbs in past tense contexts. One could argue, that epistemic modal verbs turn in to reportative modal verbs or something related whenever they are interpreted in that manner. An unified analysis is suggested in Section 7.1.5.

Turning back to *können*, a small corpus study revealed that the *past event reading* indeed hardly occur in German.¹⁹ As illustrated by Heine (1995, 23), some distributions strongly favour an epistemic interpretation, such as the selection of perfect infinitive complements. If the *past event reading* does indeed exist, it is expected to behave like any other canonical epistemic modal verb and frequently embed perfect infinitives. In search for cases of *können* with a past inflection that select perfect infinitive complements, 70 occurrences could be found. Interestingly, the overwhelming majority of these examples involves a negation or some other negative polarity item contexts, in concrete figures: 65 occurrences. This type of pattern is illustrated in (24). Among the remaining examples, one is a clear case of a context shift in which *können* is embedded by a verb of saying (*denken* ‘think’). As for the other one, no other reading seems to be plausible than a *past event reading*, as indicated in (25). Even if the context contributes another plausible AGENT, the deictic centre of the epistemic judgement undertaken in this clause

is the speaker.

- (24) Auch ein kaum Einjähriger, der es sich gar nicht anders ausgesucht
 also a hardly one.year.old REL.PRN it self INTN NOT else choose-PPP
 haben konnte, wurde bei der ausgelassenen Gaudi im
 PRF.AUX-INF can-PST PAS.AUX-PST at the jolly jamboree in.the
 Tragetaschen auf die Bar gestellt.²⁰
 carrier.bag on the bar put-PPP
 ‘Even a hardly one year old baby, who couldn’t have agreed, was put on the bar in his carrier
 bag during the jolly jamboree.’
- (25) Sicher glaubt Gernot nicht, dass meine Mutter die Sachen im Häuschen
 certainly thinks Gernot NEG that my mother the things in.the hut
 ohne meine Mitwirkung zusammengerafft hat. Steffen konnte ihm
 without my assistance snatch-PPP PRF.AUX Steffen can-PST him
 erzählt haben, dass er mir beim Transport des Fernsehers
 tell-PPP PRF.AUX-INF that he me with transportation the-GEN television
 geholfen hat.²¹
 help-PPP PRF.AUX
 ‘Certainly, Gernot will not think that my mother snatched the things in the hut without my
 assistance. Steffen could have told him that he helped me with the transportation of the
 television’

Even if the epistemic modal verb in (25) bears past inflection, its Time of Evaluation is not shifted to the past, rather it remains congruent with the Time of Utterance. Note that this example involves double past marking: on the one hand the modal verb is inflected for the past (*konnte* ‘can.PST’) and on the other, the infinitive complement involves the perfect auxiliary and a past participle *erzählt haben* ‘told have-PRF.AUX.INF’. In this respect, it is reminiscent of the example (55c) discussed by Erb (2001, 99 Fn.23). She argues that, in examples of this type, the past reference is essentially encoded by the infinitive complement that contains a perfect auxiliary. Indeed, if the perfect infinitive is replaced by a simple infinitive (*Steffen konnte ihm erzählen, dass ...*) the past orientation is no longer available.

The result of this small corpus study might be very revealing of the nature of epistemic modification. More than 90% of the occurrences of *können* are in the scope of a negative element. As will be illustrated in the remainder of this section, it is fairly doubtful as to whether epistemic modifiers can be negated at all. This is a delicate issue since negation provides a further logical operator and it is not obvious as to what possibilities there are to interact with epistemic modal operators. Therefore, one should be careful to consider these examples as epistemic. This could also be the reason as to why these uses of *können* turn out to be more compatible with past inflection. However, there are a couple of examples that do indeed seem to involve the shift of Topic Time resulting in a *past event interpretation*.

¹⁹DeReKo corpus study conducted on February 8th 2011 involving the W-TAGGED corpus. Query: *konnte /s0 (MORPH(V PCP PERF) haben)*

²⁰DeReKo: X99/FEB.04336 Oberösterreichische Nachrichten, 02.02. 1999.

²¹DeReKo: RHZ09/FEB.22507 Rhein-Zeitung, 25.02. 2009.

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In the examples (26)–(28), the Time of Evaluation is not affected by the past morphology of the modal verb, rather it coincides with Time of Utterance. Instead, the past operator takes scope over the Topic Time. Correspondingly, these sentences encode an assumption at utterance time about a time interval in the past. Moreover, the deictic centre is clearly identified with the speaker in (26) and (27). This indicates that these examples do not involve indirect reported speech, which are always characterised by a past shift of the Time Evaluation and typically exhibit context shift of the deictic centre to some third salient party.

- (26) Eine literarische Freiheit Doderers. Denn er musste wissen, dass die
 a literary freedom Doderer-GEN since he must-PST know that the
 Architekten dieses Doppelhauses [...] ‘Architekt u.
 architects this-GEN double.house-GEN architect and
 Stadtbaumeister O. Luckeneder u. C. Miserowsky’ waren und es also
 municipal.master.builder O. Luckeneder and C. Miserowsky were and it thus
 nicht von Brüdern oder gar Zwillingsgeschwistern gebaut wurde.²²
 NEG by brothers or even twins build-PPP PASS.AUX.PST
 ‘Since he must have known that the architects of this house were Luckeneder and Miserowsky
 and therefore it necessarily was not built by brothers or even twins.’
- (27) Die Vorstellung einer Trennung mußte Wagner zutiefst erschrecken²³
 the idea a-GEN separation must-PST Wagner to.the.core frighten-INF
 ‘The idea to separate must have frightened Wagner to the core.’
- (28) Wir erfahren sie [die entscheidung] nur von Athena, können aber nicht zweifeln,
 we learn she the decision only by Athena can but NEG doubt
 dass die der anderen Richter [...] ebenso subjektiv sein mussten²⁴
 that the the other judges equally subjective be must-PST
 ‘We only learn about the decision from Athena, but we cannot doubt that the other judges
 had to be as subjective as well.’
- (29) Mit einem ganzen Werkzeugladen im Gepäck mussten die Einbrecher in der
 with a entire tool.shop in.the rucksack must-PST the burglars in the
 Nacht auf Mittwoch beim Autohaus Zitta eingebrochen haben.²⁵
 night to Wednesday at.the car.house Zitta burgle-PPP have-INF
 ‘With a whole tool shop in their rucksacks the burglars must have burgled the car store Zitta
 during the night on Tuesday.’

There is another reason why examples such as (26) cannot be considered as indirect reported speech. If the past morpheme indicated indirect reported speech, the epistemic modal verb

²²Der Standard, 11. 9. 2004.

²³Eva Rieger: „Nach meiner Minna verlangt mich’s sehr“ – Minna, Richard und der Fliegende Holländer, in programme of *Der fliegende Holländer* directed by Christine Mielitz at the Staatsoper Wien, premiere at 5th December 2003, p. 20.

²⁴Walther Kraus: Das Gericht über Orest bei Aischylos, in Paul Händel (ed.) Festschrift Robert Muth, Innsbruck 1983, S. 206.

²⁵DeReKo: NON09/NOV.05033 Niederösterreichische Nachrichten, 09.11.2009.

should be construed as past assumption about Heimito von Doderer's knowledge. According to this interpretation, the deictic centre assumed at some specific moment in the past: *Heimito von Doderer must know that the architects are O and C*. In this particular example, this specific moment can be exactly determined by means of the contextual information. In the process of writing his novel *Die Strudelhofstiege* (1951), Heimito von Doderer decided to refer to a real existing house in the 9th District of Vienna. Yet, for some reason, he did not adopt the real names of the original architects which are indicated on the front door of the house but he invented new names. The only time that the assumption given above would make sense would be during Doderer's writing process, when he was choosing the names of these characters. Accordingly, the referent anchored to the deictic centre must have witnessed this time in the early fifties. There are two options to identify the deictic centre in reported speech contexts. Either it is the speaker or some other salient third party. If the deictic centre was instantiated by the speaker or author of this newspaper article, it would follow that he witnessed the time of Doderer's writing process and that he made assumptions about his knowledge at that very time. It is obvious that this interpretation is not the intended one. It is not clear whether this journalist was born at all at this time. Alternatively, the deictic centre could be identical to some other salient referent. But since in this article no such referent was introduced, this second option is also ruled out. Thus, examples such as (26) do not reflect an indirect reported speech interpretation, rather it exhibits a *past event reading* with a past shift of the Topic Time. The same reasoning applies to example (27).

The case of (28) is a little bit more complex, as the clause containing the epistemic modal verb is embedded under a predicate of attitude. Accordingly, this embedding induces a context shift in which the deictic centre is identified with subject argument of the attitude predicate *zweifeln* 'doubt'. Nevertheless, this example is very revealing. Whereas the matrix verb is inflected for present tense, the embedded epistemic modal verb *musste* 'must-PST' bears past morphology. As the act of doubting expressed by the super-ordinate predicate *zweifeln* is identical to the act of assuming encoded by the epistemic modal verb *musste*, it follows that they have to be realised in the same time interval. Thus, irrespective of its past morphology, *musste* refers to an act of reasoning that is realised at present tense. Instead, the past morphology affects the Topic Time and the state of affairs embedded modified by the modal verb yielding a *past event interpretation*. Once again, the past inflected epistemic modal verb cannot be considered as a result of indirect reported speech. The example in (29) is the first line of a news paper article and functions in a manner analogous to the instances of *musste* given above.

Similar patterns are also attested with *mögen*. They occur in particular in texts that were written before 1850, whereas they are hardly used in Contemporary German. This is in particular due to the general decline of 'purely' epistemic *mögen* compared to its concessive epistemic use, as it has been demonstrated in Section 4.2.7.

- (30) RUPRECHT: Glock zehn Uhr mocht es etwa sein zu Nacht, Und warm
 o'clock ten hours may-PST it about be-INF to night and warm
 just diese Nacht des Januars Wie Mai, –als ich zum Vater sage: [...] ²⁶
 just this night the-GEN January-GEN like may when I to.the father say

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‘RUPRECHT: It might have been 10 o’clock and the night of January was as warm as in May when I say (said) to my father: [...]’

Finally, epistemic occurrences with past morphology can also be found with *brauchen*. Once more, the past tense morpheme on the epistemic modal verbs is not interpreted as indirect reported speech. In analogy to (25), this example exhibits double past marking which is realised by the past morpheme on the epistemic modal verb *brauchte* ‘need-PST’ and by the perfect tense auxiliary *sein* in the infinitive complement. Once again, the Time of Evaluation is not affected by the past morphology and coincides with the Time of Utterance.

- (31) Es muß etwas vorgefallen sein, was ihn kränkte. Frisch brauchte das
 it must something happen-PPP be-INF that him aggrieved. Frisch need-PST that
 gar nicht bewußt gewesen zu sein²⁷
 INTN NEG conciusos be-PPP to be-INF
 ‘Something must have happened that offended him. Frisch does not need to have been aware about this.’

The *past event interpretation* of past inflected epistemic modal verbs is indeed unexpected since the modal operator and the tense operator are interpreted in an inverse order. The modal operator takes scope over the past operator even if the past morpheme attaches to the modal verb. However, this type of inverse scope is nothing that is particular to German. As it has been illustrated by Hacquard (2006, 38) and Homer (2010, 2), this pattern is very frequent in some Romance languages such as French, cf. the example (32):

- (32) (Selon la voyante) Bingley pouvait aimer Jane.
 according the fortune.teller Bingley can-PST love-INF Jane
 ‘According to the fortune teller, Bingley could have loved Jane.’ (epistemic)

As the English translation of (32) indicates, the past morpheme is interpreted in the scope of the modal operator rather than the other way round, as it is to be expected. As Jędrzejowski (2010, 35) indicates, analogous instances of scope inverse are found with Czech *musel* ‘must-PST’ and Polish *musiałem* ‘must-PST’.

Recently, Fintel and Gillies (2008, 87) discussed another case of a past operator that takes scope over an epistemic operator, as it is illustrated in example (33). Imagine a context in which the speaker was looking for ice cream and has already checked the fridge only to find that it was empty. Now, he is asked why he opened the fridge. Even already knowing that there is no ice cream in the fridge he could answer with the following sentence.

- (33) There might have been ice cream in the freezer.
 (34) Es hätte Eis im Kühlschrank drin sein können.
 it have-SBJV.PST ice.cream in.the fridge in be-INF can-PPP(ipp)

²⁶Heinrich von Kleist *Der Zebrochene Krug*, 7. Entry (1806).

²⁷DeReKo: R99/JUN.46269 Frankfurter Rundschau, 12.06. 1999.

However, this phenomenon essentially differs from the *past event reading*. The past tense morpheme on the epistemic modal verb encodes a counter-factual possibility. This becomes even more obvious considering the German counterpart (34) which involves an overt subjunctive morpheme on the perfect tense auxiliary. Thus, it is fairly likely that the past tense in the English example is also interpreted as irrealis or counter-factual. In this it equals in many respect the phenomenon that Condoravdi (2002) considers as Metaphysical Modality.

6.4 Excluded from the scope of a counter-factual operator

Coates (1983, 239) argues that epistemic modal verbs in English are never affected by subjunctive morphology. According to her view, it is the embedded predication that is interpreted as ‘hypothetical’ rather than the ‘modal predication’ expressed by the epistemic modal verb, as it is illustrated in (35). In contrast, their circumstantial counterparts are always interpreted as ‘hypothetical’ whenever they bear subjunctive morphology, as demonstrated in (36). Both examples below reflect her illustrations.

- (35) *might*_{EPISTEMIC P}
 (i) it is possible that would p
 (ii) # it would be possible that p
- (36) *could*_{CIRCUMSTANTIAL P}
 (i) # it is possible that would p
 (ii) it would be possible that p

However, Coates’ (1983) claim does not extend to German. As illustrated by Kasper (1987, 26), Eisenberg (2004, 117) and Eisenberg et al. (2005, 523), subjunctive morphology in West Germanic languages indicates counter-factuality in the canonical case. In opposition to Coates (1983, 239), there are occurrences of epistemic modal verbs bearing subjunctive morphology in German that are interpreted as counter-factual assumptions which are made by the speaker. This becomes most obvious with the verb *müssen* since it involves an epistemic interpretation that is very easy to disambiguate from other readings. Similar examples are discussed by Mortelmans (2000, 207).

- (37) Guido Niedermann fand am Waldboden eine Feder. »Ganz deutlich ist zu sehen, dass diese Feder abgebissen wurde, folglich war dieses Federvieh Opfer eines Marders oder Fuchses. Wäre die Feder ausgerupft worden, müsste der Täter ein Greifvogel gewesen sein«, erklärte Niedermann.²⁸
 Niedermann

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‘Guido Niedermann has found a feather in the forest. “I can be seen very clearly that this feather was bitten off. Thus, this poultry was victim of a marten or a fox. If the feather was pinched, it would follow from that the culprit must have been a raptor.” said Niedermann’

- (38) Wenn alle Meldungen über Schwangerschaften der Oscar-Preisträgerin
 if all reports about pregnancies the-GEN oscar-winner
 gestimmt hätten, müsste sie mittlerweile 30 Babys bekommen
 attune-PPP have-SBJV.PST must-SBJV.PST she meanwhile 30 babies get-PPP
 haben. Kidman ist Mutter zweier adoptierter Kinder.²⁹
 have-INF. Kidman is mother two-GEN adopted-GEN children
 ‘If all those reports about the Oscar winner’s pregnancies had been true, then she would be supposed to have 30 babies by now. Kidman is mother of two children that she has adopted.’
- (39) Wenn dem so wäre, müsste die Telekom hier ausnahmsweise
 if the-DAT so be-SBJV.PST must-SBJV.PST the Telekom here exceptionally
 einen Mitarbeiter beauftragt haben, der ganz unterschiedliche Namen
 a assistant commission-PPP have-INF who very different names
 trägt, sehr häufig unterwegs ist und mal Mann, mal Frau ist.³⁰
 bears very frequently on.the.road is and sometimes man, sometimes woman is
 ‘If that was right, the Telekom would be supposed to have exceptionally commissioned an assistant who has a lot of different names, who is frequently away on business, who is sometimes a man and sometimes a woman.’
- (40) Ich müsste einiges falsch verstanden haben. Aber das schließe ich
 I must-SBJV.PST wrong understand get-PPP have-INF but that conclude I
 aus, die Initiatoren sprechen sehr gut Deutsch.³¹
 out the initiators speak very well German
 ‘[In that case, I would have got something wrong. But I refute that since the initiators speak German very well.’

The two counter-factual conditionals in (38) and (39) are based on premises that the speaker considers as false. In the first example, the proposition expressed by antecedent of the conditional *All reports about the pregnancy are true* is labelled as counter-factual by the speaker. Likewise, the assumption encoded by the epistemic operator *müsste* is not factual, that is, the speaker does not assume that Kidman had 30 babies. He would only be lead to this conclusion if the proposition expressed by the antecedent of the conditional would hold for the actual world. In a similar manner, the proposition encoded by the antecedent *This is right* is refuted by the speaker. Moreover, the assumption expressed by *müsste* is not actual, but hypothetical. The speaker does not conclude in the actual world that the Telekom commissioned assistants that were that strange. A similar reasoning applies to (40), the assumption encoded by the epistemic operator is not made in the actual world, accordingly, it is a counter-factual one.

²⁸DeReKo: A00/FEB.13497 St. Galler Tagblatt, 22.02. 2000.

²⁹DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31.12. 2007.

³⁰DeReKo: NUN07/NOV.01946 Nürnberger Nachrichten, 15.11. 2007.

³¹DeReKo: BRZ07/JUL.00418 Braunschweiger Zeitung, 21.07. 2007.

To summarise, all of the occurrences of epistemic modal verbs bearing subjunctive morphology discussed above exactly reflect the corresponding counter-factual interpretation. This indicates that epistemic modal verbs can, in principal, be affected by operators that induce a counter-factual interpretation. However, this does not mean that epistemic modal verbs with subjunctive morphology are always construed in a counter-factual way. The interplay of subjunctive morphology and epistemic operators turns out to be manifold and not well understood, as the examples given by Coates (1983, 239) illustrate. An extensive discussion is given in the respective sections of the epistemic interpretations of the verbs *können* (Section 4.2.1), *müssen* (Section 4.2.2) and *sollen* (Section 4.2.6).

6.5 Excluded from nominalisations

Zifonun (1997, 1271) discusses an interesting diagnostic that has not attracted so much attention so far. As she argues, nominalisations of the traditional six modal verbs can never be epistemically interpreted.

- (41) Das (Helfen-)Wollen nützt nichts, Können muß hinzukommen.
 the help-INF.want-INF.NOUN serves nothing can-INF.NOUN must come.along
 'The will to help alone is not enough, knowledge is also necessary.'

However, her examples are not well chosen. Even in its use as a finite verb, *wollen* would not obtain a distinct epistemic or reportative interpretation with an eventive predicate such as *helfen* 'help'.

As a small corpus study based on the DeReKo corpus reveals, each of the investigated items differs with respect to its frequency and productivity. The most frequent nominalisations involve *können* (550 occurrences), *wollen* (300 occurrences) and *müssen* (70 occurrences). Crucially, most of these examples involve hapax legomena and ad hoc creations. This indicates that nominalised modal verbs cannot be considered as fixed lexicalised expressions. Rather, they are derived from a fully productive morphological nominalisation rule. Furthermore, the lack of an orthographic convention stresses the ad hoc character of these patterns. In contrast, the remaining modal verbs are not so frequently attested. *sollen* can only be found in a couple of cases, such as in example (45) which is taken from a discussion about morals. Likewise, *dürfen* occurs about 20 times, most notably dominated by instances of the nominalisation *Nichtvergessendürfen* 'the non-permission/prohibition to forget', an expression that has been coined by the novelist Martin Walser. Finally, *mögen* only occurs once as a nominalisation (47).

- (42) Es war ein gegenseitiges Sich-aufeinander-verlassen-Können, was aber auf
 it was a mutual REFL.on.each.other.rely-INF.canINF.NOUN which but on
 großer Diskretion und Eigenständigkeit auf beiden Seiten beruhte.³²
 big discretion and independence on both sides relied
 'It was a mutual reliability which was based on great discretion and independence on both sides.'

³²DeReKo: HMP06/MAR.00537 Hamburger Morgenpost, 06.03. 2006.

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- (43) Somit ist das Nicht-mehr-rauchen-Wollen der Urheber dieses
therefore is the NEG.more.smoke-INF.want-INF.NOUN the cause this-GEN
Phänomens.³³
phenomenon-GEN
'Accordingly, the intention to quit smoking is the cause of this phenomenon.'
- (44) Das Wartenmüssen fällt uns schwer.³⁴
the wait-INF.must-INF falls REFL difficult
'The necessity to wait is difficult for us.'
- (45) Nun ist zwischen Sein und Seinsollen ein durchaus merkbarer
PART is between be-INF.NOUN and be-INF.shall-INF a completely appreciable
Unterschied,³⁵
difference
'There is an appreciable difference between how things are and how things ought to be.'
- (46) Es ist das von früher Kindheit an erlernte
it is the of early childhood on learned
'Nicht-aus-einem-Konkurrenzs-system-herausfallen-Dürfen', das zu erhöhtem
NEG.off.a.competitive.system.out.fall-INF.may-INF that to increased
Niveau körperlicher und seelisch-geistiger Spannung führt.³⁶
level physical-GEN and mental-GEN tension leads
'It is the prohibition to not fall out from a competitive system that leads to an increased level
of physical and mental tension.'
- (47) Egal, Schwamm drüber, es lohnt sich nicht, über Standfestigkeit,
anyway sponge over it pays REFL NEG about resolution
Glauben-machenmögen und Glauben-wollen zu
believe-INF.make-INF.want-INF.NOUN and believe-INF.want-INF.NOUN to
schwadronieren.³⁷
swagger
'Anyway, no hard feelings! It does not pay to swagger about resolution, the intention to
pretend something and the insistence to believe something.'

Moreover, it merits attention that the modal verbs remain semantically accessible in these patterns. The nominalised modal verb can be affected by a negation, such as in the examples (43) and (46).

By and large, these examples support the generalisation elaborated by Zifonun (1997). However, there is an instance of a nominalised modal verb *müssen* which arguably involves an epistemic interpretation, as it is shown in (48).

³³DeReKo: E98/JUL.17748 Zürcher Tagesanzeiger, 18.07. 1998.

³⁴DeReKo: BRZ07/DEZ.19660 Braunschweiger Zeitung, 07.12. 2007.

³⁵DeReKo: N95/MAI.18015 Salzburger Nachrichten, 13.05. 1995.

³⁶DeReKo: N95/OKT.40437 Salzburger Nachrichten, 19.10. 1995.

³⁷DeReKo: V00/NOV.57933 Vorarlberger Nachrichten, 18.11. 2000.

- (48) Hier ist nicht die Rede von behauptetem „Gewußt-haben-Müssen“ des
 here is NEG the discussion about alleged know.PPP.INF.INF.NOUN the-GEN
 Präsidenten. Auch denken wir nicht an die vielen, jedoch ganz anderen Dinge,
 president-GEN also think we NEG at the many but very different things
 die Bögl in der Vergangenheit unbewiesen nachgesagt wurden.³⁸
 REL.PRN Bögl in the past non-proven after.say-PPP PASS.AUX.PST
 ‘What is considered here is not the allegation that the President must have known. Likewise,
 we do not think about the various things that Bögl has been accused of in the past without
 any proof.’

The past related interpretation of the complement of *müssen* indicates that the interpretation has to be epistemic. However, the fact that the author had put the nominalisation of *müssen* in quotation marks could be a hint that he does not consider it as fully acceptable. Indeed, the usage of *müssen* in (48) sounds rather awkward to a native speaker of German.

6.6 No verbless directional phrase complements

As pointed out by Barbiere (1995, 153; 2002, 54), Erb (2001, 94), Vater (2004, 18), Eide (2005, 9), Mortelmans et al. (2009) for various Germanic languages, epistemic modals do not embed verbless directional phrases. None of the examples given in Section 4.2.1 may be interpreted in an epistemic way. Not even the one with an inanimate subject (76) repeated as (49) here. Usually, inanimate subjects facilitate a disambiguation in favour of an epistemic interpretation. Instances in which *dürfte* and *mag* select a verbless directional phrase are rare and often include subject NPs that are specified for the 1. person which is a rather unexpected environment for epistemic modal verbs.

- (49) Die Sonnenwärme kann hinein, aber nicht wieder heraus.³⁹
 the sun.heat can in but NEG again out
 ‘The heat of the sun can get in but it cannot get out again.’
 # Epistemic: ‘It is likely that the heat of the sun gets in/is getting in but not getting out anymore’
- (50) Nachwuchs muss her.⁴⁰
 offspring must to.here
 ‘Offspring is needed.’
- (51) Ich würde sogar Gras essen, wenn ich nur wieder zurück dürfte. Meine
 I would even grass eat if I only again back may-SBJV.PST my
 Heimat, meine Heimat.⁴¹
 home, my home
 ‘I would even eat grass if I was only allowed to go back to my home, my home.’

³⁸DeReKo: P94/NOV.38347 Die Presse, 18.11. 1994.

³⁹DeReKo: RHZ09/FEB.09586 Rhein-Zeitung, 11.02. 2009.

⁴⁰DeReKo: A10/FEB.06142 St. Galler Tagblatt, 20.02. 2010.

⁴¹DeReKo: N93/NOV.41072 Salzburger Nachrichten, 11.11. 1993.

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- (52) Ich mag nicht schwimmen. Ich mag nach Hause.⁴²
I may NEG swim-INF I may to home
'I don't want to swim, I want to go home.'

Riemsdijk (2002, 166) discusses an example for the Dutch modal verb *zullen* with verbless directional phrase that could come into consideration for an epistemic interpretation. But since it occurs in a distribution which is non-canonical for epistemic modal verbs, further evidence is yet to be adduced as to whether it can indeed be considered as a genuine epistemic modal verb.

6.7 No VP-anaphora

As argued by Ross (1969, 87), Askedal (1997b, 13; 1998, 60), López and Winkler (2000, 639) and Drubig (2001, 30), VP anaphora only applies to modal verbs with circumstantial interpretation but not to epistemic ones, as it is illustrated in the example given by Ross (1969):

- (53) # Ottokar muss Krebs haben, und du musst es auch / und das musst Du auch.
Ottokar must cancer have and you must it too / and that must you too
'Ottokar must have cancer and you must (it) too.'

Similar observations have been made for Norwegian Eide (2005, 9). According to López and Winkler (2000, 624), the peculiarity of German is that the VP-Anaphora always has to be realised by an overt pronoun, as opposed to English where there is no overt realisation present at all. As pointed out by Reis (2001, 299 Fn. 18), it is nevertheless possible that the VP-anaphora *das* is licensed by epistemic *müssen*:

- (54) a. A: Sie könnte schlafen.
She can-SUB.PST sleep-INF
b. B: Hm, das muß sie wohl.
Hm that must she perhaps.
A: 'She could be sleeping.'
B: 'Perhaps, she must (it)'

Note, however, that B's answer equally involves the modal particle *wohl* 'perhaps'. Without the particle, the acceptability of this utterance decreases significantly. It remains to be resolved as to what the semantic contribution of this particle is exactly. Moreover, it appears that the two VP-anaphora *das* and *es* behave differently, as the latter would not be acceptable in the context (54).

However, a small corpus study revealed some instances of VP anaphora *es* that are arguably selected by an epistemic modal verb. First of all, there is an example with *könnte* that selects an eventive predicate resulting in a future oriented reading (55). But there are also examples that involve epistemic modal verbs that occur in a more typical context, such as example (57) in which it embeds a predicate that refers to a state that cannot be changed or (57)–(58) where it

⁴²DeReKo: K00/FEB.10231 Kleine Zeitung, 06.02. 2000.

embeds a past related complement. Note that in the cases with *müssen* the epistemic modal verb bears high pitch accent that indicates contrastive focus.

- (55) Die Staatsrechtler könnten da schon weiterhelfen, und der Blick auf
 the constitutional.lawyer could there PART help-INF and the look at
 andere EU-Länder könnte es auch.⁴³
 other EU-countries could VPAN too
 ‘The experts in constitutional law could help in this case and a look at other EU-countries could, too.’
- (56) „Das kann er sein, muss es aber nicht“, sagten Zeuginnen und
 this can he be-INF must VPAN but not said witness-FEM.PL and
 Zeugen dem Gericht: „Nach dem Gesamteindruck als Täter nicht
 witness-masc.pl to.the court after the overall.impression as culprit NEG
 auszuschließen... Weiß nicht, Brille, Kappe, das könnte hinkommen... Normale
 to.rule.out-INF know NEG glasses cap that could match-INF normal
 Beine in normalen Jeans...“⁴⁴
 legs in normal jeans
 ‘ “It could be him but it does not need to be the case” told the witnesses to the court: “According to the overall impression, he comes into consideration as the culprit... don’t know, glasses, cap that could match... normal legs in normal jeans...” ’
- (57) Das könnte so gewesen sein, muss es aber nicht.⁴⁵
 that could so be-PPP be-INF must VPAN but NEG
 ‘That could have been like that, but it does not need to be the case.’
- (58) Es könnte dazu beigetragen haben, muss es aber nicht.⁴⁶
 it could there.to contribute have must VPAN but NEG
 ‘It could have contributed to that but it does not need to be the case.’

As all the examples involve clearly identified deictic centres the most plausible interpretation is a ‘subjective’ epistemic one. This becomes most obvious with example (56) in which the deictic centre is overtly realised as a subject of the super-ordinate predicate *sagen* ‘say’. Interestingly, not all of the epistemic modal verbs could be attested with VP-anaphora. In the case of *dürfte*, occurrences with circumstantial interpretation could only be found, as it is shown in (59).⁴⁷

- (59) Nimmt sie den Mund zu voll? Das dürfte sie auch. Es würde keiner
 takes she the mouth too full VPAN may-SBJV.PST she also it would nobody
 wagen, ihr den Mund zu verknebeln und sie an einen Baum zu fesseln, wenn ein
 dare her the mouth to gag and she to a tree to tie when a

⁴³DeReKo: NUN98/JAN.02448 Nürnberger Nachrichten, 31.01. 1998.

⁴⁴DeReKo: RHZ00/MAL.11637 Rhein-Zeitung, 17.05. 2000.

⁴⁵DeReKo: M05/JAN.00302 Mannheimer Morgen, 04.01. 2005.

⁴⁶DeReKo: HAZ09/JUN.00510 Hannoversche Allgemeine, 04.06. 2009.

⁴⁷The investigation was based on the query *das dürfte /+w4 auch /w0* . Likewise, the query *muss es auch /w0* . obtained only instances with circumstantial interpretation (29 hits).

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Fest ansteht.⁴⁸

feast up.comes

‘Is she boasting? It would be okay for her to do so. Nobody would dare to gag her and tie her to a tree.’

Since there are clear instances of epistemic modal verbs that involve VP-anaphora, it is rather doubtful as to which extent this can really be considered as a valid restriction on epistemic modal verbs. Nevertheless, it remains to be accounted for as to why VP-anaphora fail to apply to complements of epistemic modal verbs in so many other cases, as in the ones observed by Ross (1969).

6.8 No separation in *wh*-clefts

To some extent, modal verbs can be employed in *wh*-clefts. Even if rare, these patterns are attested in corpora, as it is shown in (60) to (76). The only modal verb that could not be attested in the DeReKo corpus is *müssen*. For this items, an occurrences from the web was chosen, as exemplified in (77).⁴⁹ Interestingly, the infinitive complement that originally belongs to the modal verb and that is now realised as complement of the copula *ist* either can be realised as bare infinitive such as in (61) and (63) or as *zu*-infinitive such as in (60) and (62).⁵⁰ The precise choice is obviously influenced on the lexical item: in the case of *mögen*, three of the four occurrences that could be found take *zu*-infinitive. In contrast, *wollen* occurs ten times with *zu*-infinitive and seven times with bare infinitive. As it seems, the decisive factor is the regional variety. The vast majority of the cases with bare infinitives stem from newspapers from Switzerland, Southern Germany or Austria.

⁴⁸DeReKo: A08/JUN.03650 St. Galler Tagblatt, 13.06. 2008.

⁴⁹The investigation of the DeReKo corpus has been carried out on 1th September 2011 based on queries such as *was /+w8 (&müssen ist)* and *was /+w8 (&sollen ist)*.

⁵⁰The *zu*-infinitive might be a selectional requirement of the copula. In German *wh*-clefts the morphological format of the phrase that is extracted from the *wh*-phrase is determined by the copula and not by its original host predicate. Accordingly, the version in which the NP gets predicative nominative case from the copula (1) is clearly preferred to the version where the NP retains its original accusative case (2). But the selection of that complement cannot be driven by the copula alone as the complement clause in (3) is clearly selected by the predicate *wollen* in the *wh*-clause.

- (i) Denn was die Jugend will, ist ein einheimischer Sender.
since what the youth wants is a-NOM domestic-NOM sender
‘What the youth wants is a domestic sender’

DeReKo: E99/JAN.01479 Zürcher Tagesanzeiger, 20.01. 1999

- (ii) ??Denn was die Jugend will, ist einen einheimischen Sender.
since what the youth wants is a-ACC domestic-ACC sender

- (iii) Was ich nicht will, ist, dass aus dem Dancing eine Spelunke wird.
what I NEG want is that from the Dancing a gin-mill becomes
‘What I do not want is that the Dancing turns into a kind of gin-mill.’

DeReKo: A99/APR.27873 St. Galler Tagblatt, 21.04. 1999

- (60) „Was Kirche gut kann, ist feiern“, sagt Christina Koch.⁵¹
 what church well can is celebrate says Christina Koch
 ‘What the church can handle well is to celebrate, says Christina Koch.’
- (61) Was der Staat kann, ist den Banken Zeit zu schenken.⁵²
 What the state can is the bank time to give
 ‘What the state could do, is to give the banks time.’
- (62) Was wir können, ist größtmögliche Flexibilität zeigen.⁵³
 what we can is biggest.possible flexibility show
 ‘What is possible for us is to show a maximum of flexibility.’
- (63) Was wir definitiv können, ist uns klar von Dopingsündern zu distanzieren.⁵⁴
 what we definitely can is us clearly from doping.sinners to distance
 ‘What we can definitely do is to distance ourselves from doping sinners’
- (64) Was Gerhard Schröder nicht darf und will, ist die Rolle des Vermittlers
 what Gerhard Schröder NEG may or wants is the role the-GEN mediator-GEN
 einnehmen.⁵⁵
 in.take-INF
 ‘What Gerhard Schröder should not does not want to do is to take the role of a mediator.’
- (65) Was Stefan Köhl nicht will, ist, „noch ein Gutachten mehr in der Schublade zu
 what Stefan Köhl NEG wants is yet a review more in the drawer to
 haben“.⁵⁶
 have-INF
 ‘What Stefan Köhl does not want to have is a further review in his drawer.’
- (66) Was Richy Müller vor allem will, ist, sich nicht festzulegen.⁵⁷
 what Richy Müller above all wants is REFL NEG to.commit-INF
 ‘What Richy Müller does not want to do, above all, is to commit himself.’
- (67) Was er seit „Ziggy Stardust“ will, ist sich ständig zu verändern, ständig
 what he since Ziggy Stardust wants is REFL constantly to change-INF constantly
 Rollen zu tauschen.⁵⁸
 role to exchange-INF
 ‘What he keeps wanting to do since Ziggy Stardust is to constantly change, to constantly
 exchange roles.’

⁵¹DeReKo: BRZ09/MAR.06146 Braunschweiger Zeitung, 13.03. 2009.

⁵²DeReKo: VDI09/APR.00521 VDI nachrichten, 24.04. 2009.

⁵³DeReKo: NON09/MAR.04046 Niederösterreichische Nachrichten, 09.03. 2009.

⁵⁴DeReKo: NON09/FEB.00367 Niederösterreichische Nachrichten, 02.02. 2009.

⁵⁵DeReKo: NUN00/NOV.00017 Nürnberger Nachrichten, 01.11. 2000.

⁵⁶DeReKo: RHZ98/JUN.33947 Rhein-Zeitung, 30.06. 1998.

⁵⁷DeReKo: M09/DEZ.96667 Mannheimer Morgen, 05.12. 2009.

⁵⁸DeReKo: N97/FEB.06423 Salzburger Nachrichten, 13.02. 1997.

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- (68) Was er nicht darf, ist, während des Trainings mit den Kindern in Kontakt zu
 what he NEG may is during the training with the children in contact to
 treten und das Training stören.⁵⁹
 step-INF and the training disturb-INF
 ‘What he is not allowed to do is to be in contact with the children during the training and to
 disturb the training.’
- (69) Was man nicht darf, ist, kurz vor Wahlen aufzurufen, die Konkurrenz zu
 what one NEG may is shortly before elections to.up.call-INF the adversary to
 wählen.⁶⁰
 vote-INF
 ‘What one should not do is to make a call shortly before the elections to vote for the adver-
 saries.’
- (70) Was man nicht darf, ist wegschauen, die Zügel schleifen lassen.⁶¹
 what one NEG may is away.look-INF the rein go-INF let-INF
 ‘What one should not do is to look away, to slacken the reins’
- (71) Und was er überhaupt nicht mag, ist, herumzuliegen.⁶²
 and what he at.all NEG likes is to.around.lie-INF
 ‘And what he does not like at all is to lie around.’
- (72) Was dieses Haustier überhaupt nicht mag, ist tagsüber alleingelassen und
 what this pet at.all NEG likes is during.the.day alone.left or
 eingesperrt zu werden.⁶³
 in.penned to PASS.AUX-INF.
 ‘What this pet does not like at all is to be left alone or trapped during the day.’
- (73) Was er an seinem Beruf nicht mag, ist simpel und einfach schlafen:
 what he about his profession NEG likes is simplistic and simple sleep
 „Wenn ich nicht müsste, würde ich nie schlafen.“⁶⁴
 if I NEG must-SBJV.PST would I never sleep-INF
 ‘What he does not like about his profession is fairly simply to sleep: If I didn’t need to I
 would never sleep.’
- (74) Was ich nicht mag, ist, in Rütli-Schwur-Augen zu gucken und per Handschlag die
 what I NEG like is in Rütli-Oath-eyes to look and by handshake the
 Welt versprochen zu kriegen⁶⁵
 world promise-PPP to get-INF
 ‘What I do not like is to look into Rütli-Oath-eyes and get dishonest promises by handshake.’

⁵⁹DeReKo: A01/AUG.23631 St. Galler Tagblatt, 29.08. 2001.

⁶⁰DeReKo: HMP08/AUG.00134 Hamburger Morgenpost, 02.08. 2008.

⁶¹DeReKo: P98/JUN.25019 Die Presse, 20.06. 1998.

⁶²DeReKo: HMP06/DEZ.02015 Hamburger Morgenpost, 20.12. 2006.

⁶³DeReKo: NON07/OKT.06447 Niederösterreichische Nachrichten, 09.10. 2007.

⁶⁴DeReKo: NON09/SEP.05962 Niederösterreichische Nachrichten, 09.09. 2009.

⁶⁵DeReKo: SOZ09/JUN.00751 Die Südostschweiz, 05.06. 2009.

- (75) Was wir aber nicht sollten, ist Bürgern vorwerfen, daß sie ihre
 what we but NEG shall-SBJV.PST is citizen blame-INF that they their
 Vergangenheit nicht bewältigt hätten.⁶⁶
 past NEG overcome-PPP have-SBJV.PST
 ‘What we should not do is to blame citizens for not having come to terms with their past.’
- (76) Was Kunst aber nicht sollte, ist sich aus der Frage, welche ästhetischen
 what art but NEG shall-SBJV.PST is REFL out the question what aesthetic
 Mittel angemessen sind, einfach herauszulügen.⁶⁷
 means appropriate are simply out.to.lie-INF
 ‘What art should not do is to avoid the issue which aesthetic means are appropriate.’
- (77) was du musst, ist mal deine packungsbeilage durchlesen mädel – da
 what you must is once your package.insert through.read-INF gal there
 steht das drin!⁶⁸
 stand it in
 ‘All you have to do is to read your package insert, gal – it’s all written in there.’

As indicated by Thráinsson and Vikner (1995, 60), an epistemic modal verb cannot be separated from its infinitive complement in *wh*-clefts in Danish and Icelandic. Eide (2005, 9) comes to an analogous conclusion for Norwegian. Erb (2001, 88) and Vater (2004, 18) adopt this view for German. The example (78) given by Erb (2001) involves a perfect infinitive, which usually favours an epistemic interpretation. Nevertheless, it could only be interpreted in a circumstantial way.

- (78) # Was sie kann, ist die Kekse gegessen haben.
 what she can is the cookies eat-PPP have-INF
 Intended: ‘What could be the case is that she has eaten the cookies.’

In a similar fashion, all of the corpus examples provided above fail to be interpreted in an epistemic manner. It deserves closer attention that, among the examples found in the DeReKo corpus, the ability reading prevails for *können* in *wh*-clefts. Furthermore, undebatable control verbs such as *wollen* and the emotive reading of *mögen* are far more often attested in this *wh*-cleft pattern than *sollen* and *müssen*. This is on par with Thráinsson and Vikner (1995, 62) who argue that only control verbs involve enough argument structure in order to license the pronoun *was* in the *wh*-clause. According to their view, all of the modal verbs that occur in the *wh*-cleft configuration discussed above have to be control verbs, even deontic ones. In a similar vein, Erb (2001, 88) proposes that the subject in the *wh*-clause needs to be licensed by some predicate that assigns a semantic role to it. Since raising verbs lack a subject argument on their own, they do not come into consideration.

Since it is not obvious as to whether there are deontic modal verbs involving a control configuration, an alternative explanation is required. As it appears, the compatibility with *wh*-clefts

⁶⁶DeReKo: RHZ97/FEB.14043 Rhein-Zeitung, 24.02. 1997.

⁶⁷DeReKo: HAZ08/NOV.04835 Hannoversche Allgemeine, 27.11. 2008.

⁶⁸http://www.beepworld.de/cgi-bin/forum_de/f2/pille-durchfall-228274.html, accessed on 2nd September 2011.

is a diagnostic that is structurally related to the ability to license VP-anaphora; in both cases the modal verb selects some sort of pronoun that refers to an event. Assuming that circumstantial modal verbs are event modifiers, a potential new licenser for the two types of anaphoric elements becomes available. This could explain why the reportative control verb *wollen* is less acceptable in such a configuration than its volitional counterpart, as it has been illustrated in Section 4.2.3 and Section 5.2.

6.9 May not bear sentence accent

Öhlschläger (1989, 207) claims that ('subjective') epistemic modals lack the ability to bear "sentence accent". Likewise, Kiefer (1984, 67) argues that 'objective' epistemic modal verbs in German are more appropriate to bear an accent than subjective epistemic ones. Crucially, both of them follow the perspective developed by Lyons (1977, 797ff.), who assumes a distinction between objective and subjective epistemicity. According to the perspective developed in Öhlschläger (1989, 192), the evidence available to the discourse participants plays the key role for the interpretation of objective epistemic modals. Correspondingly, an objective epistemic modal verb expresses that the modified proposition logically follows from the evidence accessible to the discourse participants in the case of necessity modal verbs such as *müssen* or that the modified proposition is consistent with that evidence in the case of possibility modal verbs such as *können*. In contrast, Öhlschläger (1989, 202) assumes that 'subjective' epistemic modal verbs may involve a judgement that is based on 'less rational conclusions'. As will be shown in Section 6.22, however, the assumption of an independent class of objective epistemic modal verbs lacks empirical support. Most of the elements that come into consideration are clear cases of circumstantial modals, the rest turns out to behave exactly as 'subjective' epistemic modal verbs do.

In essence, subjective epistemic modals differ in that they are always interpreted with respect to the speaker who draws a conclusion based on his own knowledge. Of course, objective modal verbs also involve some kind of judgement by the speaker. It is not trivial to determine the particular nature of this judgement. Lyons (1977, 808) assumes that subjective epistemicity is more basic in everyday use of language and that objective epistemicity is derived from its subjective counterpart by an operation of objectification.

Öhlschläger (1989, 192) argues that the epistemic modal verbs *müssen*, *können* and *dürfte* occur in both variants in a subjective and an objective one. As he further claims epistemic *mögen* is the only modal verb that does not involve an objective epistemic interpretation, as it is illustrated in the examples given by Öhlschläger (1989, 207), where an underline indicates a pitch accent.

- (79) a. Der Angeklagte muss/dürfte/kann der Täter sein.
the accused must/might/can the culprit be
'The accused must/might/can be the culprit'
- b. * Der Angeklagte mag der Täter sein.⁶⁹
the accused may the culprit be

Roughly speaking, what speaker B highlights is that he has evidence or knowledge that makes speaker A's statement implausible or impossible. So what is under focus here is obviously the modal base in terms of Kratzer (1981, 1991). The two utterances differ in more than one feature: while A's utterance is a canonical declarative clause and hence an assertion, B's utterance contains an epistemic modifier, its precise illocutionary force is contested in contemporary research. Moreover, A's contribution contains a proposition in the scope of a negation whereas B casts doubt in his reply whether the negation of that proposition indeed holds and rather advocates the validity of the positive proposition.

As it appears, the type of focus applied by B in (80b) is related to phenomenon usually referred to as VERUM focus. As Höhle (1992, 112) argues, a speaker that makes use of a VERUM focus stresses that he considers the embedded proposition to be true. Accordingly, speaker A could insist in his claim by rendering B a reply containing a VERUM focus which is in main clauses usually realised on the finite verb: *Er ist es aber nicht*. 'But he isn't'. Speaker B in turn, could also persist in his viewpoint repeating (80b) maintaining the stress on *muss*. As this indicates, focus on epistemic verbs and VERUM focus are two closely related phenomena, a unified account seems possible. In a similar vein, Erb (2001, 58) has already highlighted some analogies between epistemicity and VERUM focus. Moreover, the raising verb *scheinen* can occur in similar configurations, as it has been illustrated in Section 4.2.11.

Back to the main issue – can subjective epistemic modal verbs bear stress? As demonstrated by Kratzer (1978, 1981), it is possible to trigger the respective reading employing appropriate adverbial clauses. This method should be applicable to the distinction between subjective versus objective epistemic interpretations as well. An adverbial clause such as *Aber nach dem, was ich weiß...* 'but according to what I know' should force a subjective epistemic reading. If one assumes an objective epistemic interpretation in terms of Lyons (1977) and Öhlschläger (1989), it should be triggered by an adverbial clause such as *Aber so wie es aussieht* 'but as it appears'. As it turns out, the first option is the more appropriate for B's reply. Note that in this adverbial clause the personal pronoun *I* will typically receive stress, therefore contrasting the speaker's knowledge with the knowledge from other interlocutors. This observation supports the assumption that the element under focus is something like an epistemic modal base in terms of Kratzer (1978, 1981). This indicates that even subjective epistemic modals can be stressed.

Öhlschläger's (1989) reasoning is not convincing for further reasons. According to his view, there is only one modal verb that does not involve an objective epistemic interpretation: *mögen*. Therefore, he concludes that whenever epistemic *mögen* is not compatible with a particular distribution it is due to its subjective epistemic nature. This conclusion is not licit since epistemic *mögen* might be barred in this specific environment for some other reason. As pointed out by Bech (1949, 23), Welke (1965, 110), Öhlschläger (1989, 187 Fn. 121), Fritz (1991, 48), and Diewald (1999, 236) epistemic *mögen* usually conveys a concessive meaning and behaves in a marked manner. Only in rare cases, it does denote a neutral assumption. As Welke (1965, 165) observes, these occurrences can, in particular, be found in fiction, which is known to employ a rather archaic use of language. In a similar fashion, Fritz (1997, 9) notices that epistemic *mögen* does not occur frequently in Contemporary German. This is on par with Diewald (1999, 236, 392) who demonstrated that those cases in which epistemic *mögen* denotes a neutral assumption almost became extinct. As she concludes, neutral epistemic *mögen* was replaced by its counterpart with concessive flavour. In a similar fashion, Allard (1975, 88) assumes that

concessive *mögen* is derived from its neutral epistemic counterpart. A more detailed discussion can be found in Section 4.2.7.

Recall that it has been shown above that even subjective epistemic modal verbs can carry stress. Accordingly, the reason why epistemic *mögen* is not compatible with those distributions suggested by Öhlschläger (1989, 207) is not due to its ‘subjective’ epistemic nature but rather due to its marked concessive meaning. In order to receive stress, an epistemic modal verb a counterpart that only differs minimally from it: *können* and *müssen* seem to establish such a pair, whereas *dürfte*, *mag*, *sollte* and *wird* appear to lack appropriate counterparts. Moreover, it becomes evident that there is no need to postulate a separate class of objective epistemic modal verbs. Some of the putative objective modal verbs turn out to be subjective epistemic modals, the majority however, behave like circumstantial modals in every respect, as it will be shown in great detail in Section 6.22.

Finally, Öhlschläger’s claim is not compatible with the findings of the corpus analysis conducted by Coates (1983, 243): they indicate that epistemic modal auxiliaries are typically stressed, as opposed to their non-epistemic counterparts. In a similar vein, Leech (1971, 68) argues that epistemic *may* is normally stressed, whereas it remains unstressed in its permission reading.

6.10 Excluded from the scope of an negation

In her corpus study for English, Coates (1983, 238) could not attest any epistemic modal auxiliary in the scope of a negation. In a similar manner, Leech (1971, 72) observes that epistemic *must* does not occur in the scope of a negation. Inspired by these results and the characterisation of ‘objective’ epistemic modality by Lyons (1977, 799), authors like Öhlschläger (1989, 207), Askedal (1997a, 63), Diewald (1999, 84) and Drubig (2001, 5) assume that (‘subjective’) epistemic modal verbs cannot be in the scope of a negative operator. Based on data from epistemic adverbs in Hungarian, Kiefer (1984, 71) concludes that, for Spanish, ‘subjective’ epistemic operators do not occur in the scope of a negation. Hengeveld (1988, 237) concludes for Spanish that ‘subjective’ epistemic modal operators are excluded from the scope of a negation whereas their ‘objective’ epistemic counterparts are possible in this environment. Again, it is no trivial matter to find out how a negation would be interpreted that bears scope over an epistemic modal verb. Lyons (1977, 802) suggests that every utterance consists of three components, each of which can be independently negated resulting in the following interpretations: (i) non-commitment *I don’t say that it is the case that p*, (ii) *I say that it is not the case that p* and (iii) context free assertion of a negative proposition *I say that it is the case that not-p*. According to Lyons (1977, 804), ‘subjective’ epistemic modals are part of the first component. Following his assumptions, nothing excludes that negation may target ‘subjective’ epistemic modal verbs, cf. Section 6.22 for more details. Yet, he does not make any explicit statement about this matter.⁷⁰

Adopting the ideas suggested by Lyons (1977, 801), Öhlschläger (1989, 208) demonstrates

⁷⁰Indeed, Lyons (1977, 801) observes that both subjective and objective epistemic modal verbs can be negated.

Yet, he does not explicitly point out whether negated ‘subjective’ epistemic modals are an instance of non-commitment. If he did he would predict the wrong interpretation for example (81). It is not entirely clear how Lyons (1977) would deal with these cases.

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in great detail, based on data from German, how ‘subjective’ epistemic modals and negation might interact in particular in the case of *können* and *müssen*. Similar observations have been made by Fritz (1997, 55).

- (81) Der Angeklagte kann nicht der Täter sein.⁷¹
 the accused can NEG the culprit be-INF
 (i) # ‘It is not the case that <I consider it possible that> the accused is the culprit’
 (ii) ‘<I consider it impossible that> the accused is the culprit’

In contrast to Lyons (1977), Öhlschläger (1989, 208) explicitly rules out readings in which the negation takes scope over the entire epistemically modified proposition. Assuming that the ‘subjective’ epistemic modal verb *kann* can be paraphrased as *I consider it possible that p*, its negation would express that it is not the case that the speaker assumes *p*, as it is illustrated by the paraphrase (i).⁷² As pointed out by Öhlschläger (1989, 208), however, there are exceptional cases in which subjective epistemic *können* occurs with a matrix negation. But, as he further stresses the negation involved in these patterns cannot be regarded as a canonical matrix negation but rather as a ‘morphological negation’ conveying the interpretation illustrated in (ii). A similar explanation has been proposed by Huitink (2008, Sec. 3.3).⁷³

It merits closer attention that epistemic possibility modal verbs in the scope of a negation such as in (81) typically involve a marked intonation pattern, Blühdorn (2012, Section 9.2) makes a similar observation. In most cases, they will bear a high pitch accent which is reminiscent of contrastive focus, as it has been illustrated by Selkirk (1984, 207) and Jacobs (1988, 114). In contrast to clauses that contain epistemic modal verbs without a negation, sentences like (81) cannot be uttered out of the blue. They usually require that the preceding discourse concerns the Question under Discussion whether or not the accused could be the culprit.

As a consequence, it becomes evident that some kind of contrastive focus is involved. This is on par with Jacobs (1988, 94) who pointed out that negation is a focus sensitive operator. But what element exactly is contrasted? The predicate? The modal force of the operator? If the predicate indeed was focussed, it would be expected that (82b) is a felicitous resumption of (82a) which stresses the impossibility of the modified proposition.

- (82) a. Der Angeklagte kann nicht der Täter sein...
 the accused can NEG the culprit be-INF
 b. # ...sondern er muss/soll/will der Täter sein.
 but he must/shall/wants the culprit be-INF
 Intended: ‘The accused cannot be the culprit but he must/shall/wants to be the culprit.’

Indeed, the sentence compound is acceptable but only if the contrastive focus in example (82a) is interpreted in a rather non habitual way. In the usual case, the speaker would use the

⁷¹The acceptability judgements reflect those found in Öhlschläger (1989, 208).

⁷²Yet, it is not entirely clear whether Öhlschlägers paraphrase is felicitous. Similar paraphrases are suggested by Coates (1983, 238) for epistemic *must* (*‘I infer that it is the case that...not’*); and by Sweetser (1990, 60) for epistemic *must* and for for epistemic *may* (*‘The available (direct) evidence compels me to the conclusion that’* and *‘I am not barred by my premises from the conclusion that’*).

⁷³Furthermore, Öhlschläger (1989, 88, 208) argues that epistemic *dürfte* can occur in the scope of a negation, too. However, he employs data that is not uncontroversial, as it will be demonstrated in the remainder of this section.

high pitch accent on *kann* to stress the impossibility of the proposition. Similar observations have been made by Coates (1983, 102), who has pointed out in her corpus study on English that epistemic *can't* always receives either nuclear stress or onset. However, uttering (82a), the speaker indicates that he does not consider an epistemic possibility modal verb appropriate. Instead, he suggests an item that makes an even stronger commitment to the truth of the proposition under discussion.

In a similar fashion, it cannot be the modal force that is contrasted, otherwise *muss* should be a felicit alternative. It seems, then, that once more a phenomenon related to VERUM is involved here. As already discussed above, it seems likely that what is under focus is the knowledge or the modal base. This becomes particular clear if the epistemically modified utterance is compared with its counterpart that does not contain an epistemic operator:

- (83) Der Angeklagte ist nicht der Täter.
 the accused is NEG the culprit

In this case, the speaker asserts that in the actual world the accused is not the culprit, thereby refuting some prior claim that the accused is the culprit. In doing so, he makes a commitment to the truth that the uttered proposition is true. As the speaker knows, that the accused is the culprit it follows that the accused is the culprit in all possible worlds that are consistent with his knowledge, in all possible worlds of the epistemic modal base. In contrast, a speaker that employs a focussed epistemic possibility modal verb in the scope of an negation does not make a commitment to the truth. Yet, he signals that the prior claim that the accused is the culprit is in conflict with all the possible worlds that are consistent with his knowledge. The sole difference to the case without epistemic modal verb (83) is that he does not anchor the proposition to the actual world.

That these epistemic *can* in the scope of a negation involves some sort of contrast focus is further supported by an observation documented by Lyons (1977, 801). As he points out, the subjective epistemic possibility modal *can* allows for double negation.

- (84) It can't not be raining.

Utterances as the one in (84) are only felicit in conversations in which in prior discourse some participant has claimed that it was not raining. Once again, it becomes evident that contrastive focus is involved. This may explain why Coates (1983, 102) could attest epistemic *can't* in her corpus.

Apart from epistemic *können*, at least one further epistemic modal verb in German can occur in the scope of a negation: *müssen* which, interestingly, behaves in a completely different manner. Above of all, it seems to prefer a low pitch accent followed by a high tone on the subsequent constituent. Therefore, it is possible to utter sentences such as in (85a) out of the blue. As it is obvious, no contrastive focus needs to be involved.

- (85) a. Der Angeklagte muss nicht der Täter sein...
 the accused must NEG the culprit be-INF
- b. ... er kann/#will allenfalls der Täter sein.
 he can/wants the culprit at.best be-INF

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- (i) # ‘It is not the case that <I consider it certain that> the accused is the culprit, at best he could it be.’
- (ii) ‘<I consider it uncertain whether> the accused is the culprit, at best he could it be.’

Once again, it remains to be determined what is precisely in the scope of the negation. As it is indicated in the paraphrase, the negative operator in (85) is no instance of non-commitment. Rather, it seems to be some sort of what Öhlschläger (1989, 208) calls ‘morphological negation’, a negation that only takes scope over the lexical item. An analogous reasoning applies to the rare cases of epistemic *brauchen*. Being a negative polarity item, it is restricted to environments in which it appears in the scope of a negative operator. As it has been illustrated in Section 4.2.9, there are very few instances of *brauchen* in the DeReKo corpus that exhibit an epistemic interpretation, recall the examples (411) and (412), here repeated as (86) and (87).

- (86) Was den Ort Xanten als Ort der Sage betrifft, so ist Norbert
what the village Xanten as location the-GEN myth concerns so is Norbert
Lönnendonker der Auffassung, dass das Santen des Nibelungenliedes
Lönnendonker the-GEN opinion that the Santen the-GEN Nibelungenlied-GEN
nicht am Niederrhein gelegen zu haben braucht⁷⁴
NEG at.the Lower.Rhine lie-PPP to have-INF needs
‘As for Xanten as the location of the myth, Norbert Lönnendonker believes that the village
Santen appearing in the Nibelungenlied was not necessarily located at the Lower Rhine.’
- (87) Wir haben die Telekom längst gebeten, vor Ort nachzusehen. Das braucht
We have the Telekom long.ago asked at place after.to.look-INF this need
Herr Kunz gar nicht gemerkt zu haben, weil der Techniker dafür
Mister Kunz INTN NEG notice-PPP to have-INF because the technician therefore
nicht unbedingt ins Haus muss⁷⁵
NEG necessarily into.the house must
‘We already asked the Telekom company to check his connection long ago . Mister Kunz
does not have to have necessarily noticed it because the technician does not need to enter the
house to do so.’

Furthermore, Öhlschläger (1989, 88, 208) claims that epistemic *dürfte* can be interpreted in the scope of a negation as well. According to his perspective, the example (88) can have the two interpretations indicated below .

- (88) Die Aktienkurse dürften nicht steigen.
the stock.prices may NEG rise-INF
- It is likely to be the case that the stock prices do not rise. [translation by JM]
 - It is not the case that it is likely that the stock prices do not rise. [translation by JM]

⁷⁴DeReKo:WPD/SSS.10575, Wikipedia – URL:<http://de.wikipedia.org>: Wikipedia, 2005.

⁷⁵DeReKo:NUN06/NOV.02580 Nürnberger Nachrichten, 23.11. 2006.

As the state of affairs described by the two alternatives *it is likely that not* and *it is unlikely that* is fairly similar, it is not easy to provide a context in which the wide scope interpretation (88b) is only acceptable. Such a reading could become more plausible if *dürfte* is assigned a high pitch accent and bears a contrastive focus. Based on an analysis that treats *dürfte* as an evidential, one could argue that the contrastive focus on the modal verb with negation indicates that there is no evidence that the embedded proposition is true – in opposition to what somebody else has claimed. Imagine a discourse to which the following utterance has been added: *The analyst has argued that it is likely that the stock prices will rise*. This is a situation, in which (88) should be acceptable according to Öhlschläger's expectation. Possibly, bearing a high pitch accent indicating some sort of (VERUM) focus. Yet, the individual judgements differ as to how such an option is available. Unless such examples are thoroughly attested in a corpora, it is not justified to assume that *dürfte* can occur in the scope of a negation. In any case, the wide scope reading of a negation is by far much more natural with the epistemic forms of *können* and *müssen*. As for epistemic *dürfte*, it remains to be demonstrated, that it indeed occurs in the scope of a negation.

Thus, the behaviour of the epistemic modal in the scope of a negation can be captured and formalised, assuming that modal operator are composites consisting of several components, as suggested by Kratzer (1981, 42) and Kratzer (1991, 649): a modal force (possibility/ \diamond , necessity/ \square) and conversational backgrounds. At closer inspection, it turns out that what is negated in example (85a) is only the modal force rather than the entire epistemic modal operator.

It merits closer attention that the negation of the modal force with epistemic modal verbs is only available with the indicative forms of *können* and *müssen* (and in very few occasions also with *brauchen*). Once they are replaced by their subjunctive cognates, an interpretation in which the negation bears scope over the modal force becomes excluded. As a pitch accent on a modal verb usually triggers a wide scope reading, the interpretation of the examples (89) and (91) becomes somewhat awkward. A more detailed discussion is given in Section 4.2.1 and Section 4.2.2.

- (89) # Der Angeklagte könnte nicht der Täter sein...
 the accused can-SBJV.PST NEG the culprit be-INF
- (90) # Der Angeklagte müsste nicht der Täter sein...
 the accused must-SBJV.PST NEG the culprit be-INF
- (91) # Der Angeklagte bräuchte nicht der Täter (zu)sein...
 the accused need-SBJV.PST NEG the culprit to be-INF

Differences between epistemic \diamond and \square can also be found in English. As Butler (2003, 984) and Lyons (1977, 801) argue, only epistemic *can* is possible in the scope of a negation but not epistemic necessity modals such as *must*.⁷⁶ However, Moscati (2006, 31) argues that, under particular conditions, the epistemic necessity modal verb *need* also allows for a matrix negation which obviously behaves in a similar fashion to *müssen* in German. Likewise, Fintel and Iatridou (2003, 184) and Papafragou (2006, 1694) demonstrate that some true ('subjective') epistemic modals in English can occur in the scope of a negation, such as the possibility modal *can* and

the necessity modal *need*. Finally, Homer (2010, Sect. 3.1) has demonstrated that the epistemic possibility modal verb in French *pouvoir* ‘could’ regularly occurs in the scope of a negation.

This leaves us with the question why it is in particular epistemic possibility modal verbs that occur within the scope of a negative operator. As it is evident, negated possibility are an efficient means to contradict propositions that have been stated in prior discourse. They categorically rule out the truth of the modified proposition.

Finally, there remains one problem to be solved. There are some contexts in which the *Condition on Deictic Centres* (CoDeC) does not seem to apply. The speaker who utters the sentence in (92) should implicitly know that the addressee has not seen him at the place under discussion.

- (92) Du kannst mich hier noch nie gesehen haben, ich bin zum ersten Mal in
 you can me here already never see-PPP have-INF I am to first time in
 dieser Stadt.
 this town
 ‘You can’t have seen me here before since it is the first time that I have been in this town.’

It is plausible to argue that the speaker indeed is aware of the truth value of the modified proposition, hence refuting the CoDeC. Yet, there are some loopholes which make a rescue of the CoDeC possible. First of all, it needs to be investigated as to which extent contrastive VERUM focus has an impact on epistemic modifiers. Possibly, the CoDeC only has to apply on the underlying utterance which does not contain contrastive VERUM focus. It is conceivable that contrastive VERUM focus alters the conditions for the use of epistemic modifiers. Secondly, if the speaker alternatively utters the plain sentence without a possibility modal he expresses a much stronger commitment to the truth: *Du hast mich hier noch nicht gesehen* (‘You haven’t seen me here’). Apparently, if the speaker explicitly knows the truth value of the proposition under discussion he is rather expected to invoke a sentence without modal verb, following the Gricean Maxim of Quantity. Thirdly, recall that not every possibility modal verbs needs to be an epistemic one. In particular *können* allows for practical possibility or quantificational readings. Correspondingly, among all cases of negated *können*, there are also instances of circumstantial (practical possibility, quantificational) interpretations. In contrast, whenever epistemic *müssen* occurs in the scope of a negation, the CoDeC remains unaffected. This possibly indicates that it is VERUM focus which affects the condition of the use of epistemic modifiers.

Finally, it also becomes clear how the paradox that has been observed by Westmoreland (1998, 8) can be accounted for. As he remarks, epistemic possibility and necessity modal verbs in English cannot be defined in terms of each other. He argues that *not (can_{epist} p)* is not equivalent to *must_{epist} (not (p))* in natural language hence, contradicting basic assumptions of classical modal logic. However, the fact that epistemic *can* in the scope of a negation and *must* does not behave identically should not be surprising as they drastically differ in which contexts they can be used: whereas negated *can* typically bears VERUM focus (or related sort of phenomenon) epistemic *must* does not.

⁷⁶Lyons (1977, 801) further concludes that the compatibility of epistemic *can* with double negation indicates that epistemic possibility modal verbs in English are generally more ‘basic’ than their counterparts that encode epistemic necessity. This conclusion lacks plausibility since it is *can* of all modal auxiliaries which fails to be interpreted epistemically in the absence of a negative context, as it has been frequently observed, cf. Hofmann (1976, 94), Sweetser (1990, 62), Brennan (1993, 14) and Drubig (2001, 43).

As it seems, even ‘subjective’ epistemic modal verbs can be affected by a negation in the case of *können*, *müssen* and *brauchen*. However, it is not the entire modal operator that is in the scope of the negation, rather only components are concerned, such as the modal force or modal base – a similar effect can be seen with the circumstantial use of *sollen*, cf. Section 4.2.6. In opposition, the remaining epistemic modal verbs, *könnte*, *müsste*, *dürfte*, *mögen*, *sollte* and *werden* are not at all attested in the scope of a negative operator.

6.11 Excluded from polarity questions

As pointed out by Jackendoff (1972, 103), modal auxiliaries in English disfavour an epistemic interpretation whenever they are embedded in polarity questions.

(93) Must/Should/May Max leave?

Yet, he does not explicitly exclude an epistemic interpretation for (93). In a similar fashion, Leech (1971, 68, 72, 85) observes that epistemic *may* and *must* do not occur in questions, whereas epistemic *can* does. Lyons (1977, 799) assumes that ‘objective’ epistemic modal operators may occur in questions. Following this line of reasoning, Aijmer (1978, 164), McDowell (1987, 235), Hengeveld (1988, 236), Cinque (1999, 86) and Drubig (2001, 10) argue that ‘subjective’ epistemic modal verbs are generally banned from polarity question by means of their restriction to non-assertive contexts. As they stress, questions containing an epistemic modal verb can never be interpreted as a request for the truth value of a proposition, since according to their view the epistemic modal operator is always external to the proposition. Nevertheless, Drubig (2001, 12) and Papafragou (2006, 1698) concede that a (‘subjective’) epistemic interpretation becomes available in deliberative, self addressed question. Based on data from epistemic adverbs in Hungarian, Kiefer (1984, 71) likewise concludes that ‘subjective’ epistemic operators are excluded from questions. In a similar vein, Watts (1984, 133) argues that polarity questions can only host ‘objective’ epistemic verbs. In his discussion, Lyons (1977, 796, 799, 803) suggests that ‘subjective’ epistemic modal operators and question operators compete for the same position in the structural representation of an utterance. This could imply that they are incompatible with each other, but Lyons (1977) is not explicit about that issue. Coates (1983, 242) has conducted a corpus study for English that failed to attest a canonical epistemic modal auxiliary embedded in a question. Based on these results, Nuyts (2001a, 210) assumes that ‘subjective’ epistemic modal verbs do not occur in questions in German and Dutch.

Yet, there are clear cases of information seeking questions that contain a potentially epistemic modal verb that cannot be interpreted as deliberative question. A small corpus study has provided a couple of occurrences for *können* (94)–(95) and *könnte* (96) that are part of an interview or another sort of dialogue. Such an environment ensures that the questions are indeed information seeking questions, rather than deliberative self-addressed ones. Moreover, an instance of *dürfte* could be found taken from a letter to the editor where a reader of a newspaper asks the editor about the cover image, as it is illustrated in (97).

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- (94) a. „Kann das Glas schon länger, also beispielsweise zwei Monate, gestanden haben?“
Can the glass already longer thus for.example two month stand have
- b. „Die Wohnung sah so aus, als würde sie benutzt“, erwiderte der Zeuge.⁷⁷
the flat looked so out as.if pass.aux-sbjv.pst she used responded the witness
‘ [lawyer:] “Could the glass have already stood there for two months?”
witness: “The flat looked liked it was used.” ’
- (95) a. „Kann das mit dem Unterarm so gewesen sein?“, setzt Knieriem nach
can this with the lower.arm so be be-INF set Knieriem after
- b. „Ich will es nicht ausschließen“, sagt Yükel.⁷⁸
I want it NEG exclude-INF says Yükel
‘ “Could it have been like this, regarding the lower arm?”, Knieriem continues.
“I cannot exclude it” Yükel says.’
- (96) a. Die Kriminalpolizei fragt nun: [...] Könnte es ein
the criminal.investigation.department asks now ould EXPL a
Fluchtfahrzeug gegeben haben?
get.away.vehicle give-PPP have
- b. Dazu konnte die eingesperrte Frau keine Angaben machen.⁷⁹
there.to could the arrested woman no statement make-INF
‘Criminal Investigation Department: “Could there have been a get away car?”
The arrested woman could not make a statement about this.’
- (97) Dürfte sich beim Titelbild eine seitenverkehrte Abbildung eingeschlichen haben?⁸⁰
may REFL at.the.cover.image a reversed image slip.in-PPP
have-INF
‘May a reversed image have slipped onto the cover?’

Furthermore, *sollte* could frequently be attested in questions. Yet, all of these occurrences seem to involve deliberative questions or contexts in which a deliberative interpretation cannot be excluded, as it is shown in (98) and (99). There is hardly one example in which epistemic *sollte* is embedded in a question that is explicitly used as a information seeking question. But this does not necessarily indicate that epistemic *sollte* is completely ruled out in such environments:

⁷⁷DeReKo: RHZ08/JUN.01066 Rhein-Zeitung, 02.06. 2008.

⁷⁸DeReKo: BRZ06/FEB.03571 Braunschweiger Zeitung, 07.02. 2006.

⁷⁹DeReKo: RHZ09/OKT.09470 Rhein-Zeitung, 10.10. 2009.

⁸⁰DeReKo: P97/MAI.19678 Die Presse, 24.05. 1997, Ressort: Spectrum/Tribüne der Leser; Die Garde sorgte für Rätsel.

- (98) Sollte das in Berlin wirklich unbekannt sein?⁸¹
 shall-SBJV.PST this in Berlin indeed unknown be-INF
 ‘Is it really likely that nobody knows about that in Berlin?’
- (99) Sollte da was schiefgelaufen sein?⁸²
 should there something wrong.go-PPP be-INF
 ‘Is it likely that something went wrong?’

In opposition, *müssen* does not appear to be easily compatible with information seeking questions. Two potential occurrences could be found, both of them seem to be rather specific.

- (100) a. „[...] Möglicherweise ist der Gedanke erlaubt, nach anderen Lösungen zu
 possibly is the thought permitted for other solutions to
 suchen. Muss sich der Vorgang, so könnte man überlegen, denn tatsächlich
 search-INF must REFL the incident so could one thing PART indeed
 so abgespielt haben?“
 so happen-PPP have-INF
- b. „Und?“, fragte einer der Anwälte. „Was schwebt Ihnen denn vor?“⁸³
 and asked a the-GEN lawyers what impend you PART before
 ‘“Possibly, it is admitted to look for other solutions. Is it certain, one could assume, that
 the incident happened in that particular way? ”
 “So what?” one of the lawyers asked “What do you have in mind?” ’
- (101) a. Müsste es nicht ein Traum sein, ein englisch-deutsches
 must-SBJV.PST it NEG a dream be-INF a English-German
 Fahrergespann in einem englisch-deutschen Team zu haben?
 driver.duo in a English-German team to have-INF
- b. Haug: Alle dürfen gerne von Traumbesetzungen träumen, Phantasien
 all may willingly about dream.casts dream-INF phantasies
 gehören in der Formel 1 dazu, und Träume werden dort gelegentlich auch
 belong in the Formula 1 to.it and dreams become there occasionally also
 durchaus wahr.⁸⁴
 definitely true
 ‘[journalist:] “Wouldn’t it be a dream to have an English-German driver duo in an En-
 glish German Team?”
- Haug: Everybody may have dreams about dream casts, phantasy is a part of Formula 1
 and occasionally these dreams definitely become true.’

First of all, *muss* in (100) requires a contrastive focus stress and presupposes that one of the discourse participants considers the modified proposition as true or certain. Likewise, the second

⁸¹DeReKo: BRZ10/SEP.04667 Braunschweiger Zeitung, 16.09. 2010.

⁸²DeReKo: R98/MAI.40976 Frankfurter Rundschau, 23.05. 1998.

⁸³DeReKo: DIV/DSP.00001 Scholz, Dietmar: Poldi. – Föritz, 2004 [S. 235]).

⁸⁴DeReKo: NUN07/OKT.03081 Nürnberger Nachrichten, 18.10. 2007.

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occurrence (101) underlies very particular discourse conditions. It is embedded in a question that contains a negation. In this distribution, this negative operator contributes an interesting pragmatic effect. It signals that the speaker expects that the addressee accepts and confirms the asked proposition *It must be a dream to have an English-German driving team.* In this respect, this question resembles a tag question in English. Since this type of question differs from canonical information seeking questions in crucial respects it will not receive any further attention in the upcoming section.

Once again, it is no trivial matter to decide what the interpretation of a canonical information seeking question that contains an epistemic operator would be like. As shown above, it is reasonable to consider modal operators as composites that consist of at least two sub parts: modal base and modal force. Accordingly, the question operator could interact with three different entities: either the knowledge (modal base), the strength of the assumption (modal force) or the validity of the entire assumption. Given the fact that epistemic modal verbs are interpreted with respect to the knowledge of the deictic centre, which is usually represented by the speaker, it is necessary to include the speaker in the paraphrase.

Which of these options provides the appropriate interpretation of the examples given above? Since the transliterations for epistemic modality suggested by Öhlschläger (1989, 208) and Sweetser (1990, 60) are not detailed enough and since there is good evidence that modal operators consist of several components, a paraphrase in the spirit of Kratzer (1981) seems to be the most adequate solution. Bearing in mind that the deictic centre is typically the speaker, example (102) should be the corresponding circumscription of (96):

- (102) Given my knowledge, is it true that in some of the worlds that are consistent with my knowledge there was a get away car?

However, this is certainly not what the police man speaking (96) had in mind. From a pragmatic perspective, questions like example (102) do not make sense, since there are hardly situations in which the addressee knows more about the speaker's knowledge than the speaker himself. Why should the speaker ask the addressee a question that seeks for the validity of a relation with respect to his own knowledge? Hence, questions like the one illustrated in (102) only make sense, if they are self-directed, deliberative question. For this reason, it is often assumed that epistemic modal verbs are not compatible with information seeking questions.

However, assuming that questions that contain epistemic modal operators induce a context shift where the deictic centre is identified with the addressee, an appropriate interpretation is yielded.

- (103) Given your knowledge, is it true that in some of the worlds that are consistent with your knowledge there was a get away car?

In order to find out what the semantic contribution of the epistemic operator in a polarity question precisely is, it might be fruitful to have a look at the same question without the epistemic operator. As it turns out the two questions differ in one major aspect. Asking a plain question such as *Hat es ein Fluchtfahrzeug gegeben?* 'Was there a get away car?', the speaker indicates that he expects that the addressee indeed knows the truth value of the questioned proposition. Opposed to that, a speaker who utters the very same question including an epistemic operator

conveys that he does not expect the addressee to know the truth value of the proposition under discussion. This conforms exactly to the *Condition on Deictic Centres* (CoDeC) formulated in section 4.1.3: the deictic centre, in this particular case instantiated by the hearer does not know whether the modified proposition does indeed hold.

In a similar fashion, Brennan (1993, 24) has already observed that epistemic modal verbs may occur in polarity and *wh*-questions under particular conditions. As she notices, they become acceptable whenever speaker and hearer share the same background knowledge that is necessary to evaluate the epistemic modal verb. She therefore concludes that these are instances of ‘objective’ epistemic modality in the spirit of Lyons (1977). But unfortunately, Lyons (1977, 798) is not explicit as to what an ‘objective’ epistemic modal verb denotes exactly. He only remarks that an objective epistemic modal verb encodes the speaker’s knowledge about the possibility rather a mere assumption. Obviously, what Lyons (1977) had in mind conforms to the semantic descriptions elaborated by Öhlschläger (1989, 192) who meticulously adapts the original approach of the distinction between ‘objective’ and ‘subjective’ modality. According to Öhlschläger (1989), the ‘objective’ epistemic modal verb *können* indicates that the state of affairs expressed by the modified IP is consistent with the evidence. In contrast, Öhlschläger (1989, 207) assumes that its ‘subjective’ epistemic counterpart conveys that the speaker considers it possible that the state of affairs expressed by the IP is true. But then the question arises; whose evidence is it exactly? As it seems, the evidence is at least available to the speaker and the hearer. From the assumptions defended by Öhlschläger (1989, 192), it follows that everybody to whom the evidence is accessible should know that the modified state of affairs is generally possible. Accordingly, a paraphrase for a question that embeds an objective epistemic *können* in the spirit of Öhlschläger (1989) could look like (104):

- (104) Given the evidence/ your and my knowledge about the evidence, is it true that in some of the worlds that are consistent with the evidence there was a get away car?

If the speaker and hearer both already know that this state of affair is possible, for what reason should the speaker then ask at all? If Öhlschläger’s definition is straight forward, the situation is expected to be similar to ‘subjective’ epistemic modal verbs in self-addressed deliberative questions in which the speaker asks himself a question based on his own individual knowledge. Since the evidence enables both the hearer and the speaker to draw the same conclusion, the speaker would ask a question to which he already should know the answer. As a consequence, questions that contain an (‘objective’) epistemic modal verb should convey a deliberative effect. But this is clearly not the case in the examples (94) and (96), which both behave like canonical information seeking questions. Rather, the paraphrase in example (103) seems to be more appropriate, in which the speaker asks the addressee whether the state of affairs is consistent with his knowledge. Hence, it is reasonable to conclude that question operators take scope over epistemic modal operators inducing a context shift in which the deictic centre is moved from the speaker to the addressee. This is reminiscent of the behaviour of the modal source of deontic necessity modals, as it has been pointed out by Leech (1971, 72), Depraetere and Verhulst (2008, 11): whereas the modal source (which roughly corresponds to the referent referred to as ‘deictic centre’ here) typically tends to be identified with the speaker in declarative clauses, it is rather identified with the addressee in questions and antecedents of conditionals. In a similar fashion, Doherty (1985, 19) argues that the speech act type determines how the attitude holder

is identified: whereas the attitude holder is the speaker in assertions, it remains under-specified in interrogations.

Likewise, Lasersohn (2005, 674) observed an analogous pattern of context and perspective shift with predicates of personal taste, such as *fun*. Just like epistemic modal operators, predicates of personal taste are evaluated with respect to a judge or deictic centre which is the speaker in the canonical case. Lasersohn (2005, 673) argues that a speaker usually asserts from an auto-centric perspective in which the deictic centre is anchored to the speaker. Based on a Hamblin-style analysis of questions, he assumes that a speaker who utters a question sets up a space of possible answers and invites the addressee to assert one of the alternatives. Lasersohn further argues that the deictic centre is most typically identical with the asserting instance. Since the asserting instance in questions is rather the addressee than the speaker, question operators induce an exocentric perspective in the case of canonical information seeking questions.

Interestingly, this sort of context shift with epistemic modal verbs does not apply to questions that contain negations which are interpreted in a suggestive manner such as in the example given above (101): the holder of the attitude remains identical with the speaker. The addressee is only requested to confirm the proposition as it is assumed by the speaker.

An account that analyses epistemic modal verbs in question as evidentials faces additional difficulties since it would predict that evidential modifiers should be significantly better than epistemic ones. But as it has been pointed out by Jackendoff (1972, 84), evidential adverbials in questions turn out to be as unacceptable as epistemic ones. Finally, it turns out that an approach based on objective epistemic modality does not account for the actual interpretation of epistemic modal verbs. Finally, all the problematic examples discussed by Brennan (1993, 24) can be explained by a theory based on the assumption that question operators induce context shift for epistemic operators. Such an approach is further supported by the fact that in German also other epistemic modifiers occur in polarity questions, such as the epistemic adverbials *womöglich* ‘perhaps’ and *vielleicht* ‘maybe’, but also *vermutlich* ‘presumably’ cf. the example from the DeReKo corpus:

- (105) Hat es vielleicht/womöglich ein Fluchtfahrzeug gegeben?
 Has it perhaps/maybe a get.away.vehicle give-PPP
 ‘Is it consistent with your knowledge that there was a get away vehicle?’
- (106) a. Hat Generalmajor von Tresckow also vermutlich davon gewußt, was
 has Generalmajor von Tresckow thus presumably about know-PPP what
 im hinteren Bereich seiner Heeresgruppe unter dem Stichwort
 in.the back division his-GEN army.group under the keyword
 Partisanenbekämpfung vor sich ging?
 partisan.combat before REFL went
- b. Mommsen: Ja, und zur selben Zeit haben er und seine Parteigänger im
 yes and at.the same time have he and his colleagues in.the
 Widerstand in den Stäben an den Attentatsplänen gegen Hitler
 resistance at the staffs on the assassination.plans against Hitler
 geschmiedet.⁸⁵
 forged

‘ [journalist:] “(According to your assumptions) Did Generalmajor von Tresckow (presumably) know what happened in the back divisions of his army when they executed their “combat against partisans”?” ’

Mommsen: “Yes, at the same time he made plans together with his partisans in the resistance to assassinate Hitler.” ’

Dietrich (1992, 72) provides independent evidence that epistemic adverbials occur in questions as well as in directive speech acts:

- (107) Fährst Du auch bestimmt nach Paris?
Go you also certainly to Paris
‘Are you certain that you will go to Paris?’
- (108) Kommst Du vielleicht nach Paris?
Come you maybe to Paris
‘Could it be that you come to Paris?’

Zimmermann (2004, 263) observes a related phenomenon regarding the discourse particle *wohl* which canonically marks the modified utterance as a hypothesis by the speaker. Analogously to epistemic modal verbs, they occur in questions. Though *wohl* differs in its behaviour from epistemic modal verbs in some respect, it shares at least one crucial property with them. As soon it is embedded in a question, a context shift is induced in which the deictic centre is identified with the addressee.⁸⁶

- (109) Ist Hein wohl auf See?
Is Hein wohl at sea
‘Tell me your assumption concerning Hein’s being at sea or his not being at sea: Is he at sea or not?’

Finally, keep in mind that the different readings of *können* are hard to disambiguate. This concerns in particular practical possibility and quantificational readings. So the question arises as to whether the instances of *können* in the questions discussed so far could not be analysed as quantificational or practical possibility modal verbs. And indeed, declarative clauses that contain a quantificational modal verb have a counterpart with properties of a polarity question: *Can a basketball player be small?* Turning back to the examples given above, none of them have a declarative counterpart that exhibits a quantificational interpretation. In a similar fashion, their declarative counterparts cannot be interpreted as practical possibility modal verbs. Finally,

⁸⁵DeReKo: P98/FEB.05580 Die Presse, 07.02. 1998.

⁸⁶Strictly speaking, Zimmermann (2004, 264) argues that the discourse particle *wohl* and epistemic modal verbs behave quite differently in questions. His assumptions are based on the observation that epistemic *müssen* can occur in the scope of a negation. His example might be not well chosen. As it has been demonstrated in Section 6.10, there is only a small subset of the epistemic modal verbs in German that can occur in the scope of a negation. Thus, this property cannot be considered as essential or decisive. Furthermore, what is negated is not the entire epistemic operator but just its modal force. As it has been demonstrated, an operator can at the same time interact with a negation and exhibit an epistemic interpretation. It seems to be reasonable to keep these two matters apart. Accordingly, Zimmermann’s observation is nothing that contradicts an analysis that treats *wohl* and epistemic modal verbs in a parallel way, at least in the essential points.

polarity questions that contain *könnte* or possibility adverbials like *womöglich* and *vielleicht* indicate that true epistemic modal verbs should be possible since these particular lexical items typically lack a quantificational interpretation or a practical possibility one.

To conclude, epistemic modal verbs are generally compatible with information seeking polarity questions. At least three of them are attested in the DeReKo corpus: *kann*, *könnte* and *dürfte*. Interestingly, necessity modals such as *müssen* can hardly be found in these distributions. This is unexpected for an account that is based on the assumption that all of the epistemic modal verbs in questions are objective epistemic modal verbs as in these approaches *müssen* is a prototypical objective epistemic modal verb. Rather, the restriction for epistemic operators in questions might be due to pragmatic reasons. There seem to be less scenarios in which it makes sense to ask the addressee about his state of affairs which he considers as certain. Crucially, a polarity question operator will induce a context shift for the epistemic modal operator which identifies the deictic centre with the addressee. In canonical information seeking questions the deictic centre is represented by the addressee. In particular contexts, the speaker and the addressee are identical. In these cases, the deictic centre will be assigned to the speaker providing a deliberative interpretation.

6.12 Excluded from *wh*-questions

In his analysis, Jackendoff (1972, 102) assumes that epistemic modal auxiliaries in English, being poorly inflected, have to be analysed in the same manner as sentence adverbs. At some earlier point, Jackendoff (1972, 84) observes that sentence adverbs in English do not “feel comfortable” in any context in which subject auxiliary inversion applies, such as polarity questions and *wh*-questions. Crucially, he does not relate the incompatibility of epistemic modal operators to the semantics of questions, but rather to the alignment of subject and auxiliary. Jackendoff’s arguments do not apply to German. Firstly, there is no evidence in German for a specific subject auxiliary inversion rule that uniquely applies to questions. Secondly, Jackendoff (1972, 100 Fn.5) acknowledges that German modals behave rather like main verbs. Therefore, an adverbial analysis for modal verbs in German would be not justified.

Based on the assumptions about objective epistemic modality by Lyons (1977, 799), other authors such as Cinque (1999, 86), Diewald (1999, 84), Drubig (2001, 11) and Axel (2001, 45) assume that ‘subjective’ epistemic modal verbs are restricted to assertive contexts. Likewise, McDowell (1987, 235) concludes that epistemic modal verbs are excluded from *wh*-questions for syntactic reasons. As Drubig (2001) argues, the epistemic modal operator is always external to the proposition and therefore not affected if some other illocutionary force is applied. He concedes that they are marginally acceptable if they are self addressed. However, Fintel and Iatridou (2003, 180 Fn. 11) point out that Drubig’s examples are not well chosen, since they involve infinitive complements that do not go easily along with epistemic modal verbs. As they conclude, epistemic modal verbs are acceptable in *wh*-questions.

In contrast to the claim advocated by Drubig (2001), clear instances of epistemic modal verbs can be found which occur embedded in information seeking *wh*-questions which are addressed to a person different from the speaker. These patterns are attested with *kann* (110), *könnte* (4) and *dürfte* (112)–(116). The *wh*-morphology can be attached to an argument of the embedded

infinitive (110)–(114) or to an adjunct (115) and (116):

- (110) a. „Wer kann Ihnen etwas ins Glas geworfen haben?“, fragte der
 who can you something into.the glass thrown have asked the
 Richter.
 judge
- b. „Ich denke, es war dieser Bekannte“, erwiderte die Frau.⁸⁷
 I think it was that friend answered the woman
 ‘“Who could have thrown something in your glass?” asked the judge.’
 ‘“I think it was this friend” answered the woman’
- (111) a. MOPO: Wer könnte die Fälschung der Wahl veranlasst haben?
 who could the fraud the-GEN election arranged have
- b. Steinbach: Nur einer: Revolutionsführer Ajatollah Ali Chamenei.⁸⁸
 only one revolution.leader Ajatollah Ali Chamenei
 ‘Who could have arranged the fraudulent elections?’
 ‘Only one, the leader of the revolution Ajatollah Ali Chamenei.’
- (112) a. Wer dürfte für Martina im Jahr 2000 am gefährlichsten werden?
 Who.NOM might for Martina in year 2000 at dangerous.SUP get?
- b. Martina, die Williams und Lindsay (Davenport) sind den anderen
 Martina the Williams Lindsay (Davenport are the others way
 weit voraus. Jetzt kommt es darauf an, wer am meisten macht.⁸⁹
 ahead now comes it of.it on who at most makes)
 ‘[journalist:] “Who do you think might be Martina’s main challengers in 2000?”
 [tennis player:] “Martina, Williams and Lindsay (Davenport) are way ahead. Now it is
 crucial, who is capable of doing the most.” ’
- (113) a. Wer dürfte künftig zu Ihren größten Widersachern gehören?
 who might in.future to your biggest opponent belong-INF
- b. In den Verbandsgrêmien hat man bisher über die Parteigrenzen hinweg
 in the federal.committees has one up.to.now across the party.borders away
 sehr gut an einem Strang gezogen. Ich finde es positiv, dass man die
 very well at one string pulled I find it positive that one the
 Interessen der fünf Landkreise und drei kreisfreien Städte
 interest the-GEN five land.district and three district.free cities
 zusammenbringt.⁹⁰
 together.brings
 ‘[journalist:] “Who might be your biggest opponents in the future?”’

⁸⁷DeReKo: BVZ07/FEB.00540 Burgenländische Volkszeitung, 07.02. 2007.

⁸⁸DeReKo: HMP09/JUN.01442 Hamburger Morgenpost, 17.06. 2009.

⁸⁹DeReKo: E99/OKT.27314 Zürcher Tagesanzeiger, 16.10. 1999.

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[politician:] “In the federal committees, every one pulled together very well across parties. I consider it as a positive development that interests of the five rural districts and the three urban districts are brought together.” ’

- (114) a. Was dürfte bei diesem Unglück passiert sein?
 what.NOM might at that disaster happened be
- b. ZHUBER-OKROG: Ein Triebwerk hat zu brennen begonnen. Der Brand
 a engine has to burn begun the fire
 kann viele Ursachen haben, ein Leck in der Kerosinzufuhr, alles
 can many causes have-INF a leak in the kerosine.supply everything
 Mögliche.⁹¹
 possible
 ‘[journalist:] “What do you think had happened at this disaster?”’
 Zhuber-Okrog: “An engine caught fire. The fire can have several causes, a leak in the
 kerosin supply; a lot of things.” ’
- (115) a. MOPO am Sonntag: Wie lange dürfte es bis zu einer deutschlandweit
 how long might it until to a germany.wide
 einheitlichen Regelung dauern?
 uniform arrangement last-INF
- b. Scholz: Ich gehe davon aus, dass es einen schnellen Gesetzgebungsprozess
 I go there.of out that it a quick legislation.procedure
 geben wird.⁹²
 give will
 MOPO am Sonntag: “How much time, do you think, would it take until a Germany-
 wide arrangement could be set up?”
 Scholz: “I assume that the rapid legislation procedure will be short. ”
- (116) a. Wann dürfte die Stadt wieder finanziell Boden unter den Füßen bekommen?
 When might the city again financial ground under the feet get
- b. LOHSE: Ohne eine große Gemeindefinanzreform wird keine große
 without a big municipality.finance.reform will no big
 Stadt wieder Boden unter den Füßen bekommen.⁹³
 city again ground under the feet get-INF
 ‘ [journalist:] “When might the city resolve its financial problems?”’
 Lohse: “Without a big reform of the municipality’s finances none of the big cities will
 get their feet back on the ground.” ’

All of these corpus examples are taken from dialogues, which clearly indicates that the questions involved are seeking information. Asking a canonical *wh*-question, the speaker expects the

⁹⁰DeReKo: BRZ10/FEB.05727 Braunschweiger Zeitung, 12.02. 2010.

⁹¹DeReKo: K00/JUL.55992 Kleine Zeitung, 27.07. 2000.

⁹²DeReKo: MP06/DEZ.01607 Hamburger Morgenpost, 17.12. 2006.

⁹³DeReKo: M03/DEZ.87511 Mannheimer Morgen, 30.12. 2003.

addressee to be in a position to commit himself to one proposition among the set of the possible answers. If the *wh*-question contains an epistemic operator, the speaker does not expect that the addressee knows the answer. Thus, he invites the addressee to commit himself to speculation. Zimmermann (2004, 269) considers a similar perspective.

In contrast, the remaining epistemic modal verbs *mögen*, *wird*, *müssen* and *sollte* could not be found in information seeking questions in the DeReKo corpus. Most of them are attested in self-addressed, deliberative questions. The deliberative character of the question becomes most obvious in embedded contexts in which the super-ordinate predicate is a predicate of reflection such as *denken* ‘think’ or *sich fragen* ‘to ask oneself/wonder’ rather than one used for interpersonal communication such as *fragen* ‘ask’.

- (117) „Was mag aus ihnen wohl geworden sein?“, dachte sie⁹⁴
 what may of them maybe become-PPP be-INF thought she
 ‘“What might they have become?” she thought.’
- (118) „Du lieber Himmel, was mag ich nur angestellt haben?“, fragte sich die
 you dear sky what may I only PPP have-INF asked REFL.PRN the
 besorgte Neuwiederin.⁹⁵
 worried Neuwiederian
 ‘“Oh Goodness! What did I get up to?” the worried Neuwiederian wondered.’

Once again, epistemic *müssen* is far less frequent than the remaining epistemic modal verbs, even in deliberative questions. Only a couple of instances could be found, such as (119). Interestingly, epistemic *müssen* seems to have occurred in questions much more frequent until the 18th century. As it appears, all of the historical examples (120)–(122) are deliberative questions.

- (119) Was muss das blonde Mädchen in ihren letzten Minuten gedacht haben?⁹⁶
 what must the blonde girl in her last minutes think-PPP have-INF
 ‘“What could the blonde girl have thought in her last minutes.”’
- (120) (Besieht ihn) Wahrhaftig, er ist erbrochen. Wer muß ihn denn erbrochen haben?⁹⁷
 look it indeed it is broken who must it PAR broken have
 ‘Somebody must have broken the seal, who could it be?’
- (121) Was muß es immer seyn / warum Scevin das thu’?⁹⁸
 what must it ever be-INF why Scevin that does
 ‘What could be the reason that caused Scevin to do this?’
- (122) wer musz uns diesen streich gespielt haben?⁹⁹
 who must us this trick play-PPP have-INF
 ‘Who could have played this trick on us?’

⁹⁴DeReKo: M08/JAN.03521 Mannheimer Morgen, 15.01. 2008.

⁹⁵DeReKo: RHZ06/NOV.17451 Rhein-Zeitung, 18.11. 2006.

⁹⁶DeReKo: HMP09/JAN.01337 Hamburger Morgenpost, 20.01. 2009, Bäckereifahrer ließ Katrin (24) eigenes Grab schaufeln.

⁹⁷Gotthold Ephraim Lessing, *Minna von Barnhelm*, 3, 10. (1767); translation by Curme (1922, 320).

⁹⁸Daniel Casper von Lohenstein, *Epicharis*, III 221. (1666).

⁹⁹As cited in Fritz (1997, 60): Adelung DWb 12, 2757 (1798).

6 Twenty one commandments for epistemic modality

As it has been pointed out in the last section, epistemic necessity operators are not easily compatible with interrogative speech acts. Thus, it is not clear how the examples above should be interpreted. Arguably, the uses above could be a remnant of its original meaning in Old High German when *müssen* referred to possibility rather to a necessity, as Bech (1951, 16) has illustrated. This view is confirmed by Adelung (1798, 332). As he observes, epistemic *müssen* in questions bears rather the meaning of *mögen*:¹⁰⁰

4. [...] Ingleichen die Ungewißheit oder Unwissenheit zu bezeichnen, besonders in Fragen, da es denn für mögen stehet. Wie viel muß es wohl kosten? Ein jeder fragte, wer dieser Herr seyn müßte? Was muß der wollen? Wer muß uns diesen Streich gespielt haben? Ich weiß nicht, wer der seyn muß. Was muß das bedeuten?

In a similar fashion, Curme (1922, 320) translates the German necessity modal verb *müssen* in the *wh*-question with *could*, as it is illustrated in the gloss of (120).

As it turns out, at least some of the epistemic modal verbs in German occur in information seeking questions. Recall that Brennan (1993, 24) made analogous observations for English. In a similar vein, Fritz (1997, 59) has pointed out for German that epistemic interpretations of modal verbs in *wh*-questions are marginally acceptable. As he further illustrates, these patterns obviously occurred more frequently in earlier stages of German. In contrast, Cinque (1999, 86) argues that the modals in examples such as given by Brennan (1993, 24) have to be considered as practical possibility modal verbs, rather than epistemic ones. However, he fails to empirically justify his claim. As shown above, they clearly involve a deictic centre which is identified to the addressee.

Since *wh*-pronouns share some crucial features with indefinite pronouns, one could argue that the modal verbs embedded in the *wh*-questions discussed above are not epistemic but rather quantificational modal verbs that bind a variable provided by the *wh*-pronoun. This reasoning faces some difficulties. Firstly, it has already been shown above that there are modal verbs with clearly epistemic meaning that occur in polarity question, which do not involve an indefinite or *wh*-pronoun at all. This illustrates that it cannot be the *wh*-pronoun that provides the specific possibility reading. Secondly, assuming that a question is derived from its declarative counterpart, it turns out that the matching equivalents for the questions (110)–(4) are clauses that contain epistemic modal verbs. An account based on the assumption that the modal verb in the *wh*-questions above are quantificational ones, fails to explain why they turn into epistemic ones in the corresponding declarative counterparts. Zimmermann (2004, 270) develops an analogous view for the discourse particle *wohl* ‘maybe’.

The conditions for epistemic modal verbs in *wh*-questions turn out to be analogous to the ones they underlie in polarity questions. Whenever an epistemic operator is embedded under a *wh*-operator it will be subject to context shift in which the deictic centre is identified with the addressee, rather than the speaker. In particular situations, the speaker and the addressee can be identical, such as in self-addressed, deliberative questions.

¹⁰⁰Likewise, [*müssen* is used] to refer to uncertainty or nescience in particular in questions where it replaces *mögen* (‘may’). How much must (may) it cost? Everybody asked who this Sir must (‘might’) be? What must (‘may’) this one want? Who must (‘may’) have played this trick on us? I do not know who this must (‘may’) be. What must (‘may’) this mean? [translation J.M.]

Likewise, it has turned out that not all epistemic modal verbs are compatible to the same extent with information *wh*-questions. Whereas *kann*, *könnte* and *dürfte* are solidly attested in these contexts, the remaining items are not at all. The least compatible epistemic modal verb appears to be *müssen*, which is even almost never attested in deliberative questions. Once again, the situation here exactly reflects the situation with polarity questions. An approach that is based on the assumption that only ‘objective’ epistemic modal verbs are possible in questions could not account for the idiosyncratic behaviour of the different modal verbs. The restrictions of epistemic modal verbs in questions seem to derive from the interaction of individual properties of the respective verb and pragmatic factors.

6.13 Excluded from imperatives

As Aijmer (1978, 164) observes, epistemic modal auxiliaries in English are exempt from imperatives. This is rather obvious, as modal verbs in German have not developed a proper imperative morphology, except *wollen*. As it has been illustrated in Section 4.1.1, the canonical modal verbs in Germanic languages are considered as preterite presents, verbs that developed from preterite forms of strong verbs. After they were semantically reinterpreted as independent verb forms, they started to develop their paradigm on their own, including non-finite forms. But since all of the preterite presents involve semantic concepts that are hardly used in directive speech acts, these verbs have not developed imperative morphology at all. As a consequence, it is not surprising that epistemic modal verbs do not occur in imperatives. Finally, Aijmer’s (1978) observation is correct but it equally holds for any other interpretation with which a modal verb can occur.

6.14 Excluded from optatives

Scholz (1991, 274) and Axel (2001, 45) have pointed out that in German, epistemic modal verbs are exempt from optative clauses. As Scholz (1991, 1) indicates, optatives constitute an independent sentence type in German, aside from questions, exclamatives and imperatives. With respect to their syntactic properties, three different types of optatives can be identified, each of them exhibiting a particular verb order: (i) verb initial optatives, (ii) *wenn*-clauses with the finite verb in the final position and (iii) *dass*-clauses with the finite verb in the final position. According to Scholz (1991, 1), the last type does not seem to be very relevant, since it is hardly attested in the corpora she investigated. Interestingly, the two remaining types that are significantly productive both evolved from antecedents of conditional clauses (verb initial conditionals and *wenn*-conditionals), cf. Scholz (1991, 5). As will be shown in Section 6.17, these are contexts that are not compatible with epistemic modal operators at all.

In her investigation, Scholz (1991, 275) discusses a couple of verb initial optatives that contain modal verbs, such as (123)–(125). Even in environments that make an epistemic interpretation become very likely, such as the selection of perfective infinitives, the modal verbs are construed in a circumstantial manner.

- (123) Könnten wir doch das unselig-notwendige Geschäft der
can-SBJV.PST we PAR the unfortunate-necessary business the-GEN

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Wahrheitsfindung in unserem Untersuchungsausschuß noch vor Weihnachten
 truth.establishment in our enquiry.board still before Christmas
 in Ehren hinter uns gebracht haben!¹⁰¹
 in honours behind us bring-PPP have-INF

‘(I wish) we could have respectfully terminated that unfortunate yet necessary business of finding the truth out by our enquiry board before Christmas.’

- (124) Müsste man doch nicht immer alles bereits einen Tag vor der
 must-SBJV.PST one PAR NEG always everything already a day before the
 Abgabe fertiggestellt haben!¹⁰²
 delivery complete-PPP have-INF

‘(I wish) you wouldn’t always complete the work only one day before the deadline.’

- (125) Möge ich doch nie wieder in eine derartige Situation kommen!¹⁰³
 May I PART never again in a such situation come
 ‘May I never ever get into a such a situation again’

- (126) Möge dieses Geschäft nicht nur ein Einkaufszentrum, sondern neben der Kirche
 may this shop NEG only a shopping.center but besides the church
 auch ein Ort der Begegnung sein!¹⁰⁴
 also a place the-GEN encounter be-BE

‘May this shop be not only a shopping centre but a meeting point besides the church’

Among all modal verbs, only *mögen* is broadly attested in the DeReKo corpus. At first glance, an epistemic interpretation of patterns (125) and (126) does not appear too implausible. Canonically, the speaker is identified as the volitional agent in optatives. As it is clear, the speaker in the examples above wishes that some sort of possibility would come true. But it turns out that this possibility is a real possibility in the external world, rather than an assumption that some state of affairs could be true. Likewise, a speaker would never wish that it would become true that he would have some assumption about some state of affairs. Rather, his wishes aim at the practical possibility to realise that state of affairs.

When modal verbs occur in optatives that are realised as *wenn*-clause with the finite verb in final position, an epistemic interpretation becomes even less likely, as indicated by the examples from the corpus:

- (127) Wenn ich nur wieder gesünder sein könnte.¹⁰⁵
 if I only again in.health be-INF can-SBJV.PST
 ‘If only I could be healthy again.’

- (128) Herr Doktor, die Operation wäre ja nicht schlimm, wenn nur die
 Sir doctor the surgery is-SBJV.PST PART NEG bad if only the

¹⁰¹Die Zeit, 53/87,1; as cited in Scholz (1991, 277).

¹⁰²As cited in Scholz (1991, 277).

¹⁰³As cited in, Scholz (1991, 278).

¹⁰⁴DeReKo: NON08/OKT.05203 Niederösterreichische Nachrichten, 08.10. 2008.

¹⁰⁵DeReKo: K99/AUG.60496 Kleine Zeitung, 15.08. 1999.

Narkose nicht sein müßte.¹⁰⁶
 anaesthesia NEG be-INF must-SBJV.PST

‘Doctor, the surgery would not be that bad, if the anaesthesia was not necessary.’

In her analysis, Scholz (1991, 275) elaborates a restriction on epistemic operators in optatives. In correspondence, the referent that is identified with the volitional agent can never be identical to the epistemic agent. This indicates that the incompatibility of epistemic modal verbs with optatives is obviously related to an additional reason: to the restriction that they never occur in complement clauses that are embedded by predicates of desire, as will be illustrated in Section 6.15. Arguably, optatives involve some sort of circumstantial modal operator that is specified for volitional modality. Since epistemic modal operators cannot occur in the scope of a circumstantial operator, it becomes clear why modal verbs in optatives fail to be interpreted epistemically.

As it has been demonstrated by Zimmermann (2004, 256), other speaker oriented modifiers such as the modal particle *wohl* are equally excluded from optatives:

- (129) *Käme er wohl doch.
 come-SBJV.PST he wohl PAR
 Intended interpretation ‘I wish he would possibly come’

Scholz (1991, 268) makes some similar observations with respect to evaluative and epistemic adverbs. Summing up, optatives turned out to be an environment that is not compatible with speaker oriented operators, such as epistemic modal verbs. It shares some essential properties with complement clauses that are embedded by predicates of desire on the hand and antecedents of conditional clauses on the other hand: both of them do not tolerate epistemic modal verbs.

6.15 Excluded from complement clauses

Various authors argue that epistemic modal verbs are subject to restrictions with respect to embedding in complement clauses. Based on data from English, Lyons (1977, 799) assumes that utterances that contain ‘subjective’ epistemic modal verbs are statements of opinion or hearsay. Accordingly, he suggests that they crucially differ in their illocutionary force from assertions, which in turn are statements of facts and acts of telling. Finally, he concludes that ‘subjective’ epistemic modal verbs can only be embedded by predicates that express an opinion such as *think* but not by predicates of communication, such as *tell*. As Lyons (1977, 799) argues, ‘subjective’ epistemic *might* can occur directly embedded under *think* but not directly embedded under *tell*:

- (130) He told me that he thought that it might be raining in London.

This roughly corresponds to the position defended by Aijmer (1978, 164) and Papafragou (2006, 1690, 1697), who argue that (‘subjective’) epistemic modal verbs are restricted to non-factive complement clauses, but excluded from factive ones. At first glance, it is not clear as to which extent these observations can be extended to German.

¹⁰⁶DeReKo: H87/JM6.30112 Mannheimer Morgen, 10.07. 1987.

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Departing from Lyon's initial claim, Öhlschläger (1989, 208) argues that ('subjective') epistemic modal verbs in German are generally ruled out in complement clauses that are selected by an attitude predicate. Again, his reasoning is essentially based on the assumption that *mögen* is the only epistemic modal verb that unambiguously expresses a 'subjective' epistemic modality. Since, according to his own assessment, ('subjective') epistemic *mögen* is not grammatical whenever it occurs embedded under an attitude predicate, he concludes all of the remaining ('subjective') epistemic modal verbs are ungrammatical in this distribution.

- (131) * Ich glaube/bezweifle/vermute, daß der Angeklagte der Täter sein mag.¹⁰⁷
 I believe/doubt/assume that the accused the culprit be-INF may
 'I believe /doubt/assume that the accused could have been the culprit.'

However, recall that Öhlschläger's (1989) conclusion is far from compelling. Firstly, if *mögen* is indeed unacceptable in example (131); this does not need to be due to its ('subjective') epistemicity, but it could also be caused by some idiosyncratic property. Secondly, if *mögen* is really ungrammatical in example (131); this does not need to be the case for the remaining ('subjective') epistemic modal verbs, as it has been demonstrated in Section 6.9 and 6.10.

At closer inspection, however, most of these empirical assessments turn out to be wrong. Starting with the restrictions suggested by Öhlschläger (1989, 208), it turns out that his judgements do not reflect the use of language documented in corpora. There are even occurrences of epistemic *mögen*, embedded under an attitude predicate, which contradicts Öhlschläger's (1989) expectation:

- (132) Ich schätze, dass gerade noch eine fein gefaltete Zeitung zwischen sein Auto
 I guess that just still a finely folded newspaper between his car
 und das am rechten Straßenrand gepasst haben mag.¹⁰⁸
 and that at.the right street.border fit-PPP have- may
 'I guess there might have been just enough place between his car and the one on the right to fit a folded newspaper between.'
- (133) Andere Autoren vermuten, dass Soma ein alkoholisches Getränk gewesen sein
 other authors assume that Soma a alcoholic drink be-PPP be-INF
 mag.¹⁰⁹
 may
 'Other authors assume that Soma might have been an alcoholic drink'
- (134) Günter Kern (SPD) räumte ein, dass die Erhöhung der Umlage um 0,8
 Günter Kern (SPD) cleared in that the increase the-GEN allocation about 0.8
 Prozent im vergangenen Jahr zu gering gewesen sein mag.¹¹⁰
 percent in.the passed year too small be-PPP be-INF may
 'Günter Kern (SPD) admitted that the increase of the allocation in the last year was too low, being only about 0.8 percent.'

¹⁰⁷The acceptability judgements reflect those found in Öhlschläger (1989, 208).

¹⁰⁸DeReKo: BRZ09/JUL.18290 Braunschweiger Zeitung, 10.07. 2009.

¹⁰⁹DeReKo: WPD/SSS.12965 Wikipedia, 2005.

¹¹⁰DeReKo: RHZ01/DEZ.02941 Rhein-Zeitung, 04.12. 2001.

Recall that Allard (1975, 88), Öhlschläger (1989, 187 Fn. 121) and Diewald (1999, 236, 392) observed that there are two uses of *mögen* that are relevant here, a rather archaic pure epistemic reading and a younger one that has a concessive denotation. Both of them are attested in embedded contexts: the pure epistemic one (132), (133) and the concessive one (134).

Apart from that, there are further unambiguously epistemic verbs that can be found in embedded clauses. Up to now, there is no statement about the existence of an ‘objective’ epistemic interpretation of the future auxiliary *werden*. This is not surprising since it differs from the canonical ‘objective’ epistemic modal verbs *können* and *müssen* in essential semantic respects, in that it does not express a canonical necessity or possibility.

- (135) Außerdem kenne ich den Richter und weiß, dass er kein Unmensch ist und schon
 asides know I the judge and know that he no monster is and PART
 seine Gründe dafür gehabt haben wird.¹¹¹
 his reasons therefore had have will
 ‘Aside from that, I am familiar with the judge and know that he is no monster and that he
 must have had good reasons.’
- (136) So ähnlich wünscht sich das Mutapcic heute auch, obwohl er ahnt, dass sein
 So similar wishes REFL that Mutapcic today too although he guesses that his
 Kollege Stefan Koch sich mittlerweile eine Gegenstrategie ausgedacht
 colleague Stefan Koch REFL meanwhile a counter.strategy devised
 haben wird.¹¹²
 have-INF will
 ‘Mutapcic wishes that fight will go as it did last time although he guesses that his colleague
 Stefan Koch will meanwhile have devised a counter strategy.’
- (137) Doch angesichts der Hirnentnahme wenige Wochen später liegt die Annahme
 but given the brain.removal few weeks later lies the assumption
 nahe, dass Wagner den Coup bereits zu diesem Zeitpunkt geplant und die
 close that Wagner the coup already at this moment planned and the
 Besuche auch genutzt haben wird, um sich Therese und dem engeren
 visits also benefited have-INF will in.order.to REFL Therese an the closer
 Freundeskreis als bevorzugter Gesprächspartner und Vertrauter des
 circle.of.friends as preferred dialogue.partner and intimate the-GEN
 Todgeweihten zu empfehlen.¹¹³
 moribund-GEN to recommend
 ‘But given the brain removal a few weeks later, it seems likely that Wagner could have
 already planned the coup at this particular time in order to recommend himself as a close
 intimate of the moribund.’

Compared to other epistemic verbs, unambiguous instances of epistemic *mögen* and *werden* do not occur so frequently in the DeReKo corpus. This might have several reasons. First of

¹¹¹DeReKo: NON09/SEP.18873 Niederösterreichische Nachrichten, 29.09. 2009.

¹¹²DeReKo: BRZ06/OKT.04803 Braunschweiger Zeitung, 11.10. 2006.

¹¹³DeReKo: BRZ08/JUL.08346 Braunschweiger Zeitung, 16.07. 2008.

all, epistemic and concessive *mögen* is in general fairly infrequent. Due to its specific semantic, concessive *mögen* requires a particular context. Concessive statements might in principle be less frequent than assumptions. Finally, in the case of *werden*, it is hard to disambiguate between an epistemic reading and the canonical future reference interpretation. It has yet to be checked as to which extent epistemic *werden* which embeds past referring complements occurs less frequently than its other counterparts, such as *müssen* or *können*. Recall that some authors such as Vater (1975) and Enç (1996) assume that future auxiliaries like *werden* generally have to be considered as epistemic verbs, even when referring to some future event, as it has been discussed in Section 4.2.10.

The examples above are unexpected for an account in the spirit of Öhlschläger (1989, 208). Furthermore, all of them involve modal operators that are evaluated with respect to an explicitly determined deictic centre that is syntactically realised in the matrix clause. This becomes particularly clear in those cases in which the deictic centre is not co-referential with the speaker. Accordingly, the deictic centre is identified with the subject referent of the predicate *vermuten* ‘assume’ realised by the NP *andere Autoren* ‘other authors’ in example (133), with the subject referent of *einräumen* ‘admit’ realised by the NP *Günter Kern* in (134), with the subject referent of the predicate *ahnen* ‘guess’ realised by the NP *Mutapcic* in (136), and with the referent encoded by the covert EXPERIENCER argument of *Annahme* ‘assumption’ in (137). Stephenson (2007, 489) has made a similar observation. Following Lasersohn (2005, 277), she shows that an embedded epistemic modal verb is always evaluated with respect to an argument of the super-ordinate predicate.

Crucially, the relevant individual to whom the epistemic judgement is attributed is the one realised as an argument of the relevant matrix predicate. Of course, this does not preclude that there are other referents that draw conclusions similar to the one expressed by the embedded proposition. But this does not necessarily imply that the judgements of these other referents affect the interpretation of the modal operator, as it would be expected for an ‘objective’ epistemic modal verb. Rather, the embedded modal verbs in the examples above are exclusively evaluated with respect to the respective argument provided by the super ordinate predicate. All of these sentences are true even if there is no other referent that comes to the same conclusion as the one expressed by the modified proposition. As a consequence, there is no reason to regard these modals as ‘objective’ epistemic modals, but what else should they be then? As already shown in Section 6.11, certain operators may induce a context shift for epistemic modal operators which causes a shift of the deictic centre from the speaker to some other salient individual, notably some animate argument in the super ordinate clause. It is plausible to assume that the epistemic modal verbs in the examples, above all involve a context shift in which the deictic centre is realised by an argument in the matrix clause. It turns out then that epistemic modals can be embedded, even if they are not ‘objective’. Lyons (1977, 799) and Papafragou (2006, 1691) have already provided some examples of ‘subjective’ epistemic modal verbs embedded in non-factive complement clauses for English.

In a similar fashion, Diewald (1999, 84) explicitly states that the embedding of ‘subjective’ epistemic modals is generally ruled out. Based on the observations by Lyons (1977, 798) who noticed that the ‘subjective’ epistemic interpretation of *may* is “more or less equivalent” to the adverbial *perhaps*, she concludes that epistemic adverbials are restricted to a subjective interpretation. An analogous claim has been put forth by Öhlschläger (1989, 211), who reports that

epistemic adverbs behave exactly like ‘subjective’ epistemic verbs, in that they are not compatible with a sentence accent or with a matrix negation and in that they are generally prohibited in embedded clauses. In a similar vein, Diewald (1999, 84) argues that epistemic adverbs are excluded from embedded clauses, as is illustrated in example (138). Likewise, Kiefer (1984, 69) concludes based on data from Hungarian that epistemic adverbs are always ‘subjective’ epistemic. Furthermore, Watts (1984, 138) claims that epistemic adverbs in English can only be construed with a ‘subjective’ epistemic interpretation.

In contrast to the assumptions by Diewald (1999, 84) and Öhlschläger (1989, 211), however, there is vast evidence of epistemic adverbs being embedded by various types of predicates, as is demonstrated in (139)–(146). Some of the adverbs even occur very frequently in embedded contexts, such as *vielleicht* ‘maybe’ or *womöglich* ‘possibly’. If epistemic adverbs indeed always exhibit a ‘subjective’ epistemic interpretation, Öhlschläger’s and Diewald’s assumptions concerning the acceptability of epistemic operators in embedded clauses cannot be correct.

- (138) * Ich wußte, daß ich mich vielleicht getäuscht habe.¹¹⁴
 I knew that I REFL maybe err-PPP have
 ‘I knew that I could have been wrong.’
- (139) Ich wusste, dass es vielleicht ein Frühstart war, probierte aber, gut zu
 I knew that it maybe a false.start was tried but good to
 schwimmen¹¹⁵
 swim
 ‘I knew that it might have been a false start but I tried to swim on as well as I could.’
- (140) Dass er für dauerhafte Beziehungen womöglich nicht geschaffen sei,
 that he for long.lasting relationships possibly NEG made is-SBJV.PRS
 hat Clooney bereits öfter in Interviews eingestanden.¹¹⁶
 has Clooney already frequently in interviews admitted
 ‘Clooney has already acknowledged several times that he is possibly not made for longterm relationships.’
- (141) Aber vor allem ist er dafür verantwortlich, dass der Klub sich womöglich
 but above all is he therefore responsible that the club REFL possibly
 in diesem Jahr seinen Traum erfüllen kann¹¹⁷
 in this year its dream fulfil-INF can
 ‘But he is major responsible for the circumstance that the club can possibly realise its dream in the present year.’
- (142) Vom Fahrzeug des Unbekannten weiß die Polizei bisher nur, dass es
 about.the vehicle the-GEN unknown knows the police so.far only that it
 womöglich ein italienisches Kennzeichen gehabt hat.¹¹⁸
 possibly a Italian number.plate have-PPP had

¹¹⁴The acceptability judgements reflect those found in Diewald (1999, 84), example (90).

¹¹⁵DeReKo: SOZ07/MAR.06486 Die Südschweiz, 30.03. 2007.

¹¹⁶DeReKo: HAZ08/MAI.05569 Hannoversche Allgemeine, 30.05. 2008.

¹¹⁷DeReKo: BRZ10/MAR.13972 Braunschweiger Zeitung, 29.03. 2010.

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‘Regarding the vehicle of the unknown, the police only know that it possibly had an Italian number plate.’

- (143) Hier sollte man wissen, dass Elizabeth I. wahrscheinlich am
Here should one know that Elizabeth I probably from
Rokitansky-Syndrom, einer Scheidenverengung mit unausgebildeter
Rokitansky.Syndrome a vaginal.stenosis with undeveloped
Gebärmutter litt.¹¹⁹
uterus suffered
‘At this point you should consider that Elizabeth I probably suffered from the Rokitansky-Syndrom, which is a congenital disorder.’
- (144) Ich habe gewusst, dass es bestimmt eine verbreitete Meinung gibt, auch unter
I have known that it certainly a widespread belief gives even among
der Kategorie Walser.¹²⁰
the category Walser
‘I knew that there was probably a widespread belief, even among the category Walser.’
- (145) Konsumsüchtige und Pfennigfuchser werden gleichermaßen daran
consumption.addicted and penny.pinchers PASS.AUX comparably at.it
erinnert, dass sie bestimmt noch etwas brauchen.¹²¹
remind-PPP that they certainly yet something need
‘Shopping addicts and penny pinchers are reminded that there is certainly a need for something more.’
- (146) Das große Loch in der Hose am Knie zeigt, dass er es bestimmt nicht zu
the big hole in the trousers at.the knee shows that he EXPL certainly NEG to
(irdischen) Reichtümern gebracht hat.¹²²
(earthly) wealth brought has
‘The big hole at the knee of trousers demonstrates that he certainly has not managed to acquire earthly wealth.’

In a similar vein, Zimmermann (2004, 265) demonstrated that the discourse particle *wohl* can be embedded in complement clauses. According to his view, *wohl* qualifies the modified proposition as a mere hypothesis. Zimmermann (2004, 268) assumes that *wohl* is a modifier which even scopes over the sentence type – in contrast to epistemic modal verbs. Therefore, he assumes that it takes a high position in the clausal architecture, in his perspective in ForceP. In embedded clauses, *wohl* will obligatorily undergo a context shift. Following Zimmermann’s assessment, the deictic centre which qualifies the proposition as a hypothesis in (147) can only be the matrix subject *Schröder* but not the speaker.

¹¹⁸DeReKo: RHZ06/AUG.03522 Rhein-Zeitung, 04.08. 2006.

¹¹⁹DeReKo: NUZ04/FEB.01917 Nürnberger Zeitung, 18.02. 2004.

¹²⁰DeReKo: R99/AUG.65558 Frankfurter Rundschau, 18.08. 1999.

¹²¹DeReKo: RHZ99/OKT.06336 Rhein-Zeitung, 08.10. 1999.

¹²²DeReKo: WPD/HHH.06023 MichaelDiederich; Wikipedia, 2005.

- (147) Schröder hat gesagt, dass die SPD wohl Unterstützung verdient.
 Schröder has said that the SPD wohl support merits
 ‘Schröder has said that the SPD probably deserves support.’

In opposition to the approaches defended by Öhlschläger (1989, 208) and Diewald (1999, 84), Axel (2001, 45) and Krämer (2005, 23) assume that epistemic modal verbs are only excluded from a subclass of complement clauses. According to her view, they are exempt from complements of non-factive predicates, such as *fürchten* ‘be afraid of’. Instead, (‘subjective’) epistemic modal verbs can be attested embedded under a multitude of predicate types. In what follows, a small overview is given.

As it has been pointed out above, epistemic modals occur under non-factive epistemic predicates such as *meinen* ‘believe’ which cause a context shift that identifies the deictic centre with an argument of the matrix predicate, as illustrated in (148) with the rather rare epistemic use of *müsste*:

- (148) Die Kripo meint weiter, dass bei dem Einbruch erheblicher Lärm
 the criminal.police believes further that by the burglary considerable noise
 entstanden und eventuell von Zeugen bemerkt worden sein
 arise-PPP and eventually by witnesses notice pass.aux-PPP be-INF
 müsste.¹²³
 must-SBJV.PST
 ‘In addition, the criminal investigation department believes that the burglary must have made much noise and must have been noticed by some witness.’

Other non-factive epistemic predicates that frequently embed epistemic modal verbs are *vermuten*, *annehmen* and *glauben*. In a lot of cases, their complement clauses contain the epistemic modal verb *könnte*.

Moreover, there are non-factive emotive predicates that select clauses that contain epistemic modal verbs, such as *Hoffnung* ‘hope-NOUN’ (149) and *befürchten* ‘be afraid of’ (150). Again, the deictic centre is shifted to an argument depending on the respective predicate expression:

- (149) Gieraths gab der Hoffnung Ausdruck, dass bereits Ende 2007 der erste
 Gieraths gave the hope expression that already end 2007 the first
 Bauabschnitt abgeschlossen sein dürfte.¹²⁴
 construction.section accomplish-PPP be-INF might
 ‘Gierath spreaded the hope that the first construction section might have already been accomplished by the end of 2007.’
- (150) Er befürchtete zudem, dass der Bestand der Haupt- und Realschulen in
 he feared moreover that the existence the-GEN main and real.schools in
 Remlingen und Schöppenstedt durch eine IGS gefährdet sein könnte.¹²⁵
 Remlingen and Schöppenstedt by a IGS threaten-PPP be-INF could

¹²³DeReKo: RHZ07/JUN.08087 Rhein-Zeitung, 09.06. 2007.

¹²⁴DeReKo: RHZ06/AUG.06329 Rhein-Zeitung, 08.08. 2006.

6 Twenty one commandments for epistemic modality

‘Moreover, he was afraid that the existence of the secondary schools in Remlingen and Schöppenstedt by an IGS could be threatened.’

Finally, (‘subjective’) epistemic modal verbs in German turn out to pattern with their English counterparts with respect to their behaviour in non-factive complement clauses. In both languages, they are attested in non-factive complement clauses. As a consequence, generalisations in the spirit of Diewald (1999, 84) are far too restrictive and have to be refuted.

A couple of authors suggest another restriction for epistemic modal operators in complement clauses. Lyons (1977, 799), Aijmer (1978, 164), Papafragou (2006, 1690, 1697) and Huitink (2008, 6) argue that complements of factive predicates in English can only contain (‘objective’) epistemic modal verbs, whereas their (‘subjective’) epistemic counterparts are restricted to complements of non-factive predicates such as attitude predicates. Consider first Lyon’s (1977) reasoning, which seems to be based on the assumption that predicates of communication only embed communicative acts that correspond to the act expressed by the predicate under discussion. Remember that Lyons (1977, 799) assumes that ‘subjective’ epistemic modal verbs are not acts of telling but statements about opinion or hearsay. Therefore, he predicts that they cannot be embedded by predicates of telling. Do these claims extend to German?

Authors such as Krämer (2005, 23) assume that the epistemic modal verb *werden* cannot be embedded by the predicates *wissen* ‘know’ and *hoffen* ‘hope’. But as it has been already demonstrated above, epistemic *werden* is attested in *dass*-clauses that are selected by *wissen* (135)–(137). As for the other verbs, a solid sample of data collected from the German DeReKo corpus demonstrates that there are epistemic modal verbs in factive complement clauses embedded by predicates of communication, such as predicates of telling (151) and (152), predicates of declaring (153), other predicates of communication, such as negated *schreiben* ‘write’ (154), but also predicates of perception (155). As it will be shown later, it is more plausible to assume that they are interpreted in a ‘subjective’ manner rather than in an ‘objective’ one.

- (151) Ein Kollege hat mir erzählt, dass es da schlimm ausgesehen haben
a colleague has me told that it there bad out.look-PPP have-INF
muss.¹²⁶
must
‘A colleague told me that it must have been quite a mess there.’
- (152) Und er erzählt, dass dieses Rätsel bald gelöst sein könnte.¹²⁷
And he tells that this riddle soon solv-PPP be-INF could
‘And he said that this riddle could be solved soon.’
- (153) Polizeisprecher Thomas Figge erklärte gestern auf Anfrage, dass der
police.spokesman Thomas Figge declared yesterday on demand that the
33-Jährige mindestens Tempo 100 gefahren sein muss.¹²⁸
33.year.old at.least tempo 100 drive-PPP be-INF must

¹²⁵DeReKo: BRZ09/JUN.11090 Braunschweiger Zeitung, 24.06. 2009.

¹²⁶DeReKo: RHZ01/NOV.07278 Rhein-Zeitung, 10.11. 2001.

¹²⁷DeReKo: NUN03/AUG.02519 Nürnberger Nachrichten, 28.08. 2003.

‘The police spokesman Thomas Figge declared yesterday, on demand, that the 33 year old must have driven at least 100 km/h.’

- (154) Sie schreiben aber nicht, dass die „Verschlankung“ hauptsächlich zu Lasten
 You write but not that the streamlining mainly to burden
 des Bürgers gegangen sein dürfte.¹²⁹
 the-GEN citizen go-PPP be-INF might
 ‘But you don’t write that the streamlining could have affected in particular the common citizens.’
- (155) Außerdem habe ich vernommen, dass möglicherweise ein Lungeninfarkt
 in.addition have I heard that possibly a pulmonary.infarction
 die Ursache gewesen sein könnte.¹³⁰
 the cause be-PPP be-INF could
 ‘In addition, I have heard that the cause could have possibly been a pulmonary infarction.’

It merits closer attention that the epistemic modal verbs embedded in the examples above behave in a peculiar manner with respect to the identity of the deictic centre. In contrast to epistemic modal operators in non-factive complement clauses, the deictic centre can be principally linked to the speaker in factive complement clauses that are embedded by predicates of communication, such as in example (154). The identity of the deictic centre seems to be less clear in cases (151)–(153). Most plausibly, the epistemic modal verbs in these examples reflect an assumption of the matrix subject referent: *Ein Kollege* ‘a colleague’ in (151), *er* ‘he’ in (152) and *Polizeisprecher Thomas Figge* in (153). But this type of example does not entirely exclude that the truth evaluation expressed by the epistemic modal verb is conducted by the speaker. This concerns particularly situations in which the speaker wants to express that he is not so sure whether the proposition uttered by the matrix subject referent indeed holds. In such configurations, this referent is not interpreted as suitable epistemic agent and therefore, the deictic centre is identified with the speaker. Admittedly, this type of interpretation is rather rare.

Finally, with predicates of communication that concern the perceptive aspect rather than the productive such as *vernehmen* ‘hear’ in (155), there are two possibilities to identify the deictic centre. The most plausible interpretation is probably the one in which the deictic centre is instantiated by the matrix subject referent *ich* ‘I’. In addition, it is possible to link the deictic centre to the referent who has uttered the embedded proposition. This is the case in a context in which the speaker refers to an assumption that has been made by somebody else. As for the example given above, this would be a referent that uttered: *The cause could possibly have been a pulmonary infarction*. Accordingly, the epistemic evaluation is done by that other referent rather than by the speaker. This results in an interpretation in which the speaker indicates that the embedded proposition is a reported assumption. In such an interpretation, it is not necessary that the speaker shares the judgement of that other referent as it is expressed in the reported assumption. For instance, he may know that the cause was indeed something else other than a pulmonary infarction.

¹²⁸DeReKo: BRZ09/MAI.05146 Braunschweiger Zeitung, 12.05. 2009.

¹²⁹DeReKo: RHZ06/JUL.23923 Rhein-Zeitung, 26.07. 2006.

¹³⁰DeReKo: NON09/JAN.07234 Niederösterreichische Nachrichten, 19.01. 2009.

As has been illustrated, epistemic modal verbs behave differently in factive and non-factive complement clauses. This is obviously due to the crucial contrast between non-factive and factive predicates. Whereas non-factive predicates introduce an EXPERIENCER argument which encodes an epistemic agent, factive predicates do not contribute such an argument. In some cases, they might involve some sort of related argument that does not manifestly refer to an epistemic agent per se, such as a referent that tells something in example (152). However, by means of pragmatic mechanisms such as coercion it is possible to reinterpret the ‘teller’ argument as an epistemic agent.

In the case that an epistemic modal verb is embedded in a complement clause and the matrix verb introduces an argument that is explicitly labelled as an epistemic agent, the deictic centre will have to be linked to this matrix argument. This reflects the behaviour of epistemic modal verbs in non-factive complement clauses. In a similar fashion, Zimmermann (2004, 265) argues that related epistemic modifiers, such as the discourse particle *wohl*, may never take scope out of a complement clause. In other words, as long as such a modifier occurs in a complement clause the deictic centre will be identified with an argument of the super-ordinate predicate rather than the speaker. Since factive predicates do not provide an argument that refers to a manifest epistemic agent, the identification of the deictic centre is more flexible and underlies different principles.

If the examples discussed above indeed contain ‘objective’ epistemic modal verbs, it is expected that the proposition expressed by the embedded clause should be an assumption that generally could be derived from public evidence, as is argued by Papafragou (2006, 1697). But this is clearly not the case in the examples (151)–(155). In each case, the referent which is in the position to undertake the judgement expressed by the embedded clause is clearly determined by an argument of the matrix predicate. As it turns out, the interpretation of epistemic modal operators in non-factive complement clauses and factive ones is very similar. This is reflected by the acceptability judgements undertaken by Papafragou (2006, 1690): whereas she considers ‘subjective’ epistemic modal verbs that are embedded in non-factive complement clauses fully acceptable, she judges them to be marginally acceptable (‘?’) in factive complement clauses rather than completely ungrammatical (‘*’). The reason why her examples sound less acceptable might be due to the fact that they do not involve a plausible context that provides a salient candidate to be identified as the deictic centre. All these observations once more indicate that even ‘subjective’ epistemic modal verbs can be embedded by predicates of telling. Finally, all their main clause counterparts are most plausibly interpreted in the ‘subjective’ epistemic interpretation.

After having discussed factive predicates of communication, the remainder of this section will now shift the focus to other types of factive predicates. Lyons (1977, 799) assumes that ‘objective’ epistemic modal verbs are possible in complement clauses that are embedded by factive predicates. According to his view, this class encompasses communicative verbs like *tell* but also verbs like *know*. Some authors such as Aijmer (1978, 164), Papafragou (2006, 1690, 1697) and Huitink (2008, 6) conclude that their ‘subjective’ epistemic counterparts are generally excluded in English within these environments.

But as it turns out for German, ‘subjective’ epistemic modal verbs are attested under (semi)-factive predicates and expressions, such as *Tatsache* ‘fact’ (156) and *zeigen* ‘show’ (157) but also under emotive (semi)-factive predicates such as *erstaunlich* ‘astounding’ (158).

- (156) Allein die Tatsache, dass er in seiner Ausbildung beim BKA gelernt haben
 just the fact that he in his education at.the BKA learn-PPP have-INF
 dürfte, welche geringe Trinkmenge bereits ausreicht, um den Autoschlüssel
 might what small drink.quantity already in.order.to the car.key PART
 erst gar nicht mehr in die Hand zu nehmen, ließ den Richter zweifeln.¹³¹
 INTN NEG more in the hand to take let the judge doubt
 ‘Just the fact that he might have learnt at the BKA what small quantities of alcohol are
 permitted for car drivers made the judge being doubtful.’
- (157) Aber der aktuelle Fall zeigt, dass die Bank ihre Linie geändert haben
 But the actual case shows that the bank its line change-PPP have-INF
 dürfte.¹³²
 might
 ‘But the actual case shows that the bank might have changed its strategy.’
- (158) Erstaunlich, dass noch kein Anhänger etwa des Dalai Lama sich
 surprising that yet no fan for.example the-GEN Dalai Lama REFL
 klargemacht haben dürfte, dass das Gold in tibetischen Tempeln daher
 clear.make-PPP have-INF might that the gold in Tibetan temples there.from
 stammte, dass die Mönche, die auch die Beamtenschaft stellten, das einfache
 stemmed that the monks the also the civil.service represented the simple
 Volk ausgebeutet hatten.¹³³
 people exploited had
 ‘It is surprising that no admirer of the Dalai Lama may have realised that the gold in Tibetan
 temples was exploited from the ordinary people.’

Apart from the examples given here, further similar factive predicates were attested, such as *sich herausstellen* ‘turn out’ and *ergeben* ‘result’. As already observed above, factive predicates do not involve an argument with proto-typical properties of an epistemic agent. Accordingly, the deictic centre of the epistemic operator does not always need to be identified with an argument of the super-ordinate predicate, as illustrated in example (157), in which it is identified with an argument of a predicate that is even more highly located in the clausal hierarchy.

Assuming that (‘subjective’) epistemic modal verbs involve a deictic centre that has to be linked to some salient referent, it is possible to account for all those instances that are embedded in factive complement clauses. But what ensure that these cases do involve ‘subjective’ epistemic modality rather than ‘objective’? First of all, each of these examples contains a modal operator that does not relate to objective facts that everybody could derive from the ‘public evidence’, as it would be expected by Öhlschläger (1989, 192), Nuyts (2001b, 393), Papafragou (2006, 1697) and Huitink (2008, 5). According to Nuyts, the use of a subjective epistemic modifier indicates that the speaker “alone knows (or has access to) the evidence and draws conclusions from it”, while objective epistemic modality indicates that “the evidence is known to a larger group of people who share the same conclusion based on it”.¹³⁴ In opposition to that, the

¹³¹DeReKo: RHZ07/JUL.17219 Rhein-Zeitung, 18.07. 2007.

¹³²DeReKo: BVZ09/OKT.00654 Burgenländische Volkszeitung, 07.10. 2009.

¹³³DeReKo: NUZ07/MAR.02890 Nürnberger Zeitung, 27.03. 2007.

modal operators in (156)–(158) reflect assessments that are undertaken by clearly contextually determined epistemic agents. This epistemic agent is in each case realised as a matrix argument or the speaker referent. Crucially, in no case, the acceptability of the embedded modal operators above hinges on the existence of additional epistemic agents that are not already represented by that matrix argument or the speaker referent. As a consequence, the deictic centre is always strictly linked to a matrix argument or the speaker, and never involves additional less specifically identified referents. Of course, this does not exclude that there are other individuals that draw exactly the same conclusion as it is expressed by the embedded proposition, but this is not part of the meaning of the epistemic operator. This behaviour is reminiscent of epistemic predicates, such as *believe* and *think*. Most notably, these predicates attribute a private belief to the subject referent.

Again, nothing excludes that there are other individuals that independently have the same belief – but this is irrelevant for the interpretation of these predicates. Likewise, it seems then that every epistemic modal operator encodes a private belief. If these epistemic modal verbs embedded in factive complement clauses only refer to an assumption that is undertaken by the deictic centre but never to assumption of a vaguely determined larger group of people that witnesses the ‘public evidence’, the question arises as to which extent the distinction between ‘subjective’ and ‘objective’ epistemic modality is really necessary.

Secondly, the term ‘public evidence’ as it is used by Papafragou (2006, 1697) requires a more thorough elaboration. From an intuitive perspective, it seem to be clear what it should mean. Yet, it is not clear whether it really supports the assumption of ‘objective’ epistemic modality. Consider the following paraphrase for an ‘objective’ epistemic necessity operator: there is a set of individuals that all have the same knowledge and based on this knowledge it logically follows that the modified proposition is true. This circumscription involves three crucial aspects: first the shared knowledge, the nature of the conclusion, and the set of individuals. Accordingly, ‘public evidence’ means that all the relevant individuals have the same knowledge. How can this observation be captured in precise terms? Firstly, it will be hardly ever possible that two individuals have exactly the same knowledge. As a consequence, ‘public evidence’ can only concern some sub-part of the individuals’ knowledge. Then, the question arises as to how this sub-part is precisely determined. The most appropriate solution appears to be to define ‘public evidence’ as a set of propositions that is part of every individual’s knowledge. Accordingly, any proposition will be considered as ‘objective’ epistemic necessity if it logically follows from the set of proposition that make up the ‘public evidence’. Analogously, ‘objective’ epistemic possibility corresponds to any proposition that is logically consistent with this set of propositions. Since ‘objective’ epistemic modifiers canonically are seen as logic operator, individuals exposed to the ‘public evidence’ will always evaluate a given proposition in the very same manner. ‘Objective’ epistemic reasoning excludes any individual influence and will lead to the same conclusion for each epistemic agent. Unfortunately, this approach faces another substantial shortcoming concerning the nature of the conclusion. It would predict that individual’s remaining knowledge apart from the set of proposition labelled as ‘public evidence’ does not have any influence on the

¹³⁴Actually, Nuyts (2001b, 393) employs the term ‘inter-subjective’ epistemic modality rather than ‘objective’ epistemic modality. Nevertheless, his new term corresponds in essential aspects to what Lyons (1977) called ‘objective’ epistemic modality.

evaluation of the modally modified proposition. And this is not plausible, any individual might have experiences that are relevant for the epistemic evaluation of the respective proposition but that are not part of the ‘public evidence’.

Assume that the ‘public evidence’ in example (157) is defined by the set of propositions $E = \{ \textit{The bank is accused of fraud.}, \textit{A lot of costumers lost their assets.}, \textit{The costumers claimed compensation.}, \textit{The bank ignored their claims arguing every costumer was aware of the risk.}, \textit{Suddenly, the bank signals cooperativeness to talk with the costumer.} \}$. Based on this set, the journalist draws the conclusion expressed in (157): *But the actual case shows that the bank might have changed its strategy.* In case this reasoning involves ‘objective’ epistemic modality, it is expected that every individual that knows this set of proposition E will always reach the same conclusion. However, there could be an insider whose knowledge comprises the public evidence E and additionally some more specific evidence $E' = \{ \textit{In three similar cases in the past, the bank already demonstrated cooperativeness.}, \textit{In none of them the claims of the costumers were admitted.}, \textit{The bank's favoured diversionary tactic is to signal cooperativeness with the costumers} \}$. Certainly, this insider will not share the conclusion drawn by the journalist expressed in example (157). In the extreme case, he could come to the reverse conclusion that the embedded proposition is not the case: *But the actual case shows that the bank might not have changed its strategy.* Similar situations frequently occur in scientific discussion: different researchers draw different conclusions based on the same observations. And it is in particular their reasoning that is considered as the canonical case of ‘objective’ epistemic modality, as it argued by Papafragou (2006, 1695).

This indicates that ‘objective’ knowledge is a fairly intricate thing to model. It is not clear whether a precise description of ‘objective’ epistemic modality seems to be possible that is not based on ‘subjective’ epistemic reasoning. As the observations above indicate, it is not possible to strip off the subjective aspect of epistemic reasoning. Every epistemic assessment is above all based on individual private knowledge. This even concerns so-called ‘objective’ epistemic reasoning which turns out to be as ‘subjective’ as ‘subjective’ epistemic reasoning. Likewise, it remains to be proven that there are indeed conclusions based on ‘public evidence’ that does not involve private knowledge and ‘subjective’ epistemic reasoning. Unless there is a clear definition what ‘public evidence’ precisely is, any attempt to pursue an account that is based on that concept is premature. Since ‘objective’ epistemic modality does not seem to be compatible with its fundamental concept of ‘public evidence’, it is doubtful to which extent it exists at all.

Finally, Papafragou (2006, 1690) concedes that ‘subjective’ epistemic modal verbs in factive complement clauses are not entirely ungrammatical, rather less acceptable. As a consequence the degree of acceptability that she attributes to ‘subjective’ epistemic operators in factive complement clauses is only slightly lower than the one she attributes to their ‘objective’ epistemic counterparts in analogous environments. However, there is an alternative explanation for these undeniable contrasts of acceptability. Based on the assumption that epistemic modal operators are always interpreted in a ‘subjective’ manner, this lower degree of acceptability could be due to the circumstance that some of the contexts in Papafragou’s (2006) examples do not clearly provide determined epistemic agents as possible candidates for the deictic centre. At this point the question arises; what urges the assumption of an ‘objective’ epistemic modality at all? This issue will be more thoroughly addressed in Section 6.22.

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A similar observation regarding factive complement clauses has been made by Haegeman (2006, 1664), who pointed out that factive predicates such as *regret* are “not easily compatible” with speaker oriented adverbs. Haegeman (2004, 171), generally assumes that factive complement clauses involve less syntactic complexity, in particular they lack a ForceP. Coniglio (2008, 91) comes to a similar conclusion.

Finally, there are verbs that altogether lack arguments which are suitable as a deictic centre, already on the conceptual layer, such as *föhren zu* ‘lead to’, *sorgen für* ‘ensure’ and *beitragen zu* ‘contribute’.

- (159) Dank diesem Auswärtsremis rückten sich die Romands für das Rückspiel in
thanks this away.draw moved REFL the Romands for the return.match in
zwei Wochen in eine ausgezeichnete Ausgangslage und sorgten dafür, dass
two weeks in a excellent starting.position and caused therefore that
die Pontaise wieder einmal bis auf den letzten Platz gefüllt sein dürfte.¹³⁵
the Pontaise again once until of the last place fill-PPP be-INF might
‘Due to that draw away the Romands got into an excellent starting position for the return
match in two weeks and they will ensure that the Pontaise might be crowded one more
time.’

Since the matrix predicate is lacking an appropriate argument, the deictic centre is identified with the most salient referent supplied by the context, in the cases above with the speaker.

Nevertheless, there are some types of complement clauses which seem to exclude epistemic modal verbs systematically, such as complements of desire predicates. This is clearly for pragmatic reasons since no speaker would wish that he assumes a particular state affairs to be the case, rather he would wish to become this state of affairs true. In a similar fashion, Schenner (2009, 186) points out that desire predicates do not allow reportative uses of *sollen*.

- (160) # Der Archäologe wünscht sich, dass die Mumie schon mehr als 5000 Jahre
the archaeologist wishes REFL that the mummy already more than 5000 years
alt sein dürfte/könnte.
old be-INF might/could.
Intended reading: ‘The archeologist wishes that the he/someone would consider it possible
that the mummy is more than 5000 years old.’

Likewise, Krämer (2005, 23) points out that the epistemic verbs such as *werden* are exempt from complement clauses of semantically related predicates such as *hoffen* ‘hope’.

Summing up, in this section it has been demonstrated that epistemic modal verbs are empirically attested in numerous types of complement clauses. Non-factive predicates typically introduce an animate AGENT or EXPERIENCER argument which is typically in the state of reasoning about some state of affairs. In this, it much resembles the deictic centre which is provided by an epistemic modal operator. Therefore, this argument becomes a plausible candidate to be identified with the deictic centre, this is how canonical context shift is induced. In contrast, factive predicates often lack such an argument that is suitable for an identification with the deictic

¹³⁵A98/SEP.58581 St. Galler Tagblatt, 18.09. 1998.

centre. Contrary to the assumptions by Lyons (1977, 799), Aijmer (1978, 164), Papafragou (2006, 1690, 1697) and Huitink (2008, 6), ‘subjective’ epistemic modal operators are even attested in factive complement clauses. In the absence of an appropriate argument, the deictic centre will be identified with the most salient referent provided by discourse, in most cases this will be the speaker. Moreover, it has been shown that the assumption of ‘objective’ epistemic modality is not necessary to account for the occurrence of epistemic modal verbs that are embedded in factive complement clauses. Furthermore, ‘objective’ epistemic modality is based on ‘public evidence’ which has turned out to be a rather problematic notion. Alternatively, epistemic modals in factive complement clauses can be explained in terms of a deictic centre that does not always need to be linked to the speaker referent. Rather, it will be identified with the most salient referent in its immediate environment.

6.16 Excluded from event related causal clauses

As Nuyts (2001a, 212) observes, epistemic modal verbs “sound very awkward if not downright impossible” in causal clauses in German and Dutch. Following Aijmer (1978, 164), Öhlschläger (1989, 209) argues that in German causal *weil*-clauses cannot embed ‘subjective’ epistemic modal verbs. Assuming that most modal verbs are ambiguous between a ‘subjective’ and ‘objective’ epistemic interpretation, he concludes that the items in (161) have to be interpreted in an objective way. According to his view, *mögen* is the only unambiguously ‘subjective’ epistemic modal verb. Therefore, he expects it to be ungrammatical in causal clauses, as is illustrated in (162).

- (161) Der Angeklagte wird inhaftiert, weil er der Täter sein
 the accused PASS.AUX arrested because he the culprit be-INF
 muß/dürfte/kann.¹³⁶
 must/might/can
 ‘The accused will be arrested because he must/might/could be the culprit.’

- (162) * Der Angeklagte wird inhaftiert, weil er der Täter sein mag.¹³⁷
 the accused PASS.AUX arrested because he the culprit be-INF may
 ‘The accused will be arrested because he might be the culprit.’

As already shown in various other sections, Öhlschläger’s reasoning is empirically not justified. First of all, there are different reasons why sentence (162) appears to be more marked than the one in (161). Recall that the epistemic use of *mögen* conveys a rather specific concessive meaning, as opposed to the remaining epistemic modal verbs. Secondly, even epistemic *mögen* is attested in causal clauses, as it will be shown below.

There are different types of causal clauses: event related causal clauses, epistemic causal clauses or speech act causal clauses, as it has been pointed out by Sweetser (1990, 77). As demonstrated by Wegener (1993, 293), Uhmann (1998, 120), Günthner (2008, 112) and Antomo and Steinbach (2010, 30), epistemic (and speech act) causal clauses in German exhibit

¹³⁶The acceptability judgements reflect those found in Öhlschläger (1989, 209).

¹³⁷The acceptability judgements reflect those found in Öhlschläger (1989, 209).

independent illocutionary force, they are designated to embed discourse particles, speaker oriented adverbs, epistemic modal verbs, as it has been illustrated in Section 5.4.2. The restriction for epistemic modal verbs put forward by Aijmer (1978, 164) and Öhlschläger (1989, 209), would only make sense for event related causal clauses. As observed by Wegener (1993, 295), it is a crucial property for event related *weil*-clause that the proposition expressed by the matrix clause is presupposed – whereas it is an assumption in the case of epistemic *weil* clauses.

Again, it turns out that epistemic modal verbs are attested in event related *weil*-clauses. If they are indeed ‘subjective’ epistemic modal, it should be possible to clearly identify the deictic centre. Several different types of data have to be distinguished with respect to the way the deictic centre is identified. In the first type, the deictic centre is instantiated by some argument introduced by the matrix predicate.

- (163) Er habe auch Schuldgefühle gehabt, weil seine auffällige Frisur Auslöser für
 he has also guilt.feelings had because his peculiar hair.cut cause for
 den Überfall gewesen sein könnte.¹³⁸
 the robbery be-PPP be-INF could
 ‘He had also feelings of guilt because his peculiar hair cut could have been cause for the robbery.’
- (164) Gegenüber der Polizei gab die Täterin schließlich an, dass sie zugestochen
 face.to.face the police gave the delinquent finally on that she stabbed
 hatte, weil sie die ihr bekannte Postbeamtin erkannt haben könnte.¹³⁹
 had because she the her known post.clerk recognise-PPP have-INF could
 ‘When being questioned, the delinquent finally stated that she stabbed the post clerk because (she was afraid that) she could have been recognised by her.’
- (165) Weil der Schlossverkauf nun doch abgeblasen sein dürfte, überlegt die
 because the castle.sale now PART blow.off-PPP be-INF might considers the
 Gutsverwaltung die Errichtung eines Heizwerkes.¹⁴⁰
 property.administration the construction a-GEN heating.station-GEN
 ‘Because the sale of the castle might have been canceled, the administration of the property considers an construction of a heating station.’
- (166) Weil die Bautätigkeit ihren Zenit überschritten haben dürfte,
 because the construction.activity her zenith cross-PPP have-INF might
 rechnet die Branche für das laufende Jahr mit einer Abnahme der
 calculates the branch for the running year with a decline the-GEN
 Lieferungen.¹⁴¹
 export
 ‘Because the construction activity might have reached its peak, the industry expects that the exports will decline during the current year.’

¹³⁸DeReKo: BRZ07/OKT.02983 Braunschweiger Zeitung, 12.10. 2007.

¹³⁹DeReKo: NON09/MAR.00732 Niederösterreichische Nachrichten, 02.03. 2009.

¹⁴⁰DeReKo: NON09/MAR.19357 Niederösterreichische Nachrichten, 31.03. 2009.

¹⁴¹DeReKo: A08/JAN.02315 St. Galler Tagblatt, 10.01. 2008.

- (167) An der Schule selbst wird vor allem deshalb genauestens ermittelt,
 at the school self PASS.AUX above all therefore precisely investigated
 weil der Täter mit dem Klassenzimmer bestens vertraut gewesen sein
 because the culprit with the class.room best familiar be-PPP be-INF
 muss.¹⁴²
 must
 ‘The investigations focus on the school because the culprit must have been very familiar
 with the class room.’
- (168) Auch eine Einigung mit den Beamten halte er nur „hypothetisch“
 also a agreement with the public.servants considers he only hypothetically
 für möglich, weil das dann wieder Auswirkungen auf den ASVG- Bereich
 for possible because that then again effects on the ASVG sphere
 haben müsste.¹⁴³
 have-INF must-SBJV.PST
 ‘He considers an agreement with the public servants possible, but only hypothetically, be-
 cause this should have effects on the ASVG-sphere.’

In the examples (163)–(168), the matrix clause expresses a presupposed fact and the adverbial clause encodes the cause that brought about this precise fact. In these particular cases, the cause is an assumption which has been made by a referent encoded in the matrix clause: the subject referent’s feeling of guilt had been caused by his assumption about his haircut in (163), the act of stabbing had been caused by the subject referent’s suspicion in (164), the subject referent’s reflections about the construction of a heating station are caused by his assumption about the castle in (165), the subject referent’s calculations about future exports are caused by his assumption about the construction activity in (166), the investigations lead by the agent referent are caused by the assessment of the culprit’s knowledge in (167) and conclusion drawn by the subject referent are caused by his assumption on the effect of the agreement (168). Finally, this appears to be also the adequate interpretation for (161), the subject referent of *inhaftieren* ‘arrest’ is identical with the deictic centre of the embedded epistemic modal verb.

Similar to event related conditionals, event related event causal clauses are adjoined to the VP, as it was pointed out by Uhmann (1998, 108). In this configuration, the arguments of the VP appear to be able to bind the deictic centre variable provided by the epistemic modal operator. As a consequence, these types of event related *weil* clauses are interpreted as factive causes which are instantiated by an assumption. The overall structure could be described as: CAUSE (ASSUMPTION (P)). Correspondingly, the event expressed by the matrix clause is caused by an assumption. Altogether, these *weil*-clauses behave like canonical event related causal clauses providing a *fact-factive cause* interpretation. What ensures that the epistemic modal operators construe in a ‘subjective’ manner rather than in an ‘objective’? First of all, all of the modal verbs in (168)–(163) are clearly evaluated with respect to one specifically determined deictic centre. This becomes particularly obvious in the examples (163) and (164). In both cases, the matrix predicate is specified for a Topic Time that precedes utterance time resulting in a past reference.

¹⁴²DeReKo: V99/DEZ.60463 Vorarlberger Nachrichten, 17.12. 1999.

¹⁴³DeReKo: K00/JUL.50015 Kleine Zeitung, 04.07. 2000.

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As it has been shown in Section 6.3, an epistemic modal operator introduces a further time interval: the Time of Evaluation. In the canonical case, the deictic centre is identified with the speaker and the Time of Evaluation is anchored to the Time of Utterance. However, in these two aforementioned examples, the Time of Evaluation precedes Time of Utterance. At first glance, this is surprising since the embedded verbs *könnte* and *dürfte* reflect assessments that are made at Time of Utterance, in the canonical case. But as these assessments are the cause of the matrix event, they necessarily have to precede even the Topic Time of the matrix clause. The fact that Time of Evaluation is shifted to the past is a convincing indicator that some sort of context shift applies here. If those examples involved ‘objective’ epistemic modality, this behaviour would be unexpected as ‘objective’ epistemic reasoning should be accessible to any epistemic agent at any time. Accordingly, the shift of the Time of Evaluation would remain unaccounted for. This clearly indicates that the epistemic modal operators in the examples discussed above are evaluated with respect to a clearly specified deictic centre, therefore reflecting ‘subjective’ epistemic reasoning. As demonstrated by Papafragou (2006, 1694), English ‘subjective’ epistemic modal auxiliaries can occur in causal clauses with a *fact-factive cause* reading as well.

However, there are also configurations in which the deictic centre is anchored to the speaker. Again, the matrix clauses in the examples (169)–(174) express presupposed propositions and not assumptions made by the speaker. This ensures that the *weil* clauses under investigation are indeed event related instead of epistemic.

- (169) Und weil dieses Lichtspiel am Himmel sich just an Heiligabend
and since this illumination at.the sky REFL just at christmas
dargeboten haben mag, nannten die ehrfürchtig-berührten Menschen diesen
present-PPP have-INF may called the reverent-touched people this
Ort fortan Bethlehem.¹⁴⁴
place henceforth Bethlehem
‘(I assume) It was because this illumination has occurred at Christmas, that the reverent and touched people called this place, henceforth, Bethlehem.’
- (170) Weil eben diese Tatsache für viele wichtiger sein mag, als sämtliche
Because just this fact for many more.important be-INF may than all
Veränderungen in der Verwaltung, feierten die Haider diesen Aufstieg
changes in the administration celebrated the Haider that promotion
besonders ausgelassen.¹⁴⁵
particularly frolicsomely
‘(I assume) It was because this fact might be more important than any change in the administration that the team from Haid celebrated this promotion in particular frolicsome manner.’
- (171) Weil die Dolmetscherin ihr Deutsch-Studium zeitig abgebrochen haben
because the interpreter has German.studies early abandon-PPP have-INF
muss, entwickelte sich die Pressekonferenz zu einer lustigen Veranstaltung.¹⁴⁶
must developed REFL the press.conference to a funny event

¹⁴⁴DeReKo: A97/DEZ.43149 St. Galler Tagblatt, 24.12. 1997.

¹⁴⁵DeReKo: X96/AUG.16359 Oberösterreichische Nachrichten, 14.08. 1996.

‘(I assume) It was because the interpreter had obviously abandoned her studies of German at an early stage that the press conference became a funny event.’

- (172) Weil der Wähler den Eindruck haben muss, dass die Sozialdemokraten
because the voter the impression have-INF must that the social.democrats
nicht mehr wissen, was sie wollen, sind sie im 20-Prozent-Keller
NEG more know what they want are they in.the 20.percent.cellar
gelandet.¹⁴⁷
landed
‘(I assume) It was because the Social Democrats do not know anymore what they want, that they ended up in the 20% cellar.’
- (173) Weil irgendwer den falschen Knopf an seiner High-Tech-Telefonanlage
Because someone the wrong button on his high-tech-telephone.switchboard
gedrückt haben mag, steht man plötzlich im telekommunikativen
press-PPP have-INF may stands one suddenly in.the telecommunicative
Dunkeln und einer finsternen Sackgasse der Stille.¹⁴⁸
darkness and a gloomy blind.alley the-GEN silence
‘Because somebody might have pressed the wrong button on his high-tech telephone switchboard, you finds yourself in the darkness of telecommunication and in a gloomy blind.alley of silence.’
- (174) Weil der Osterhase diese nette Aktion aber bereits geahnt haben
Because the Easter.bunny this nice action but already guess-PPP have-INF
muss, gab es auch schon als kleine Aufmerksamkeit Schoko-Osterhasen
must, gave it also already as small attention chocolate.Easter.bunnies
für die Kinder, die der Bürgermeister (mit passender eigelbfarbener
for the children which the Mayor with corresponding egg.yellow
Krawatte) den fleißigen Bastlern überreichte.¹⁴⁹
tie the busy makers over.handed
‘Because the Easter Bunny must already have guessed the nice activity, there were already chocolate Easter bunnies provided for the children, which were handed over by the Mayor to those busy makers.’

Contrary to the configurations of the first type, the examples (169)–(174) do not involve a factive cause but an epistemically possible cause. The speaker, who utters (171), knows that the conference was a funny event. The interpretation of the epistemic modal verb in the adverbial clause deserves closer attention. Evidently, it takes scope over the CAUSE operator. The speaker knows about the funniness of the conference and now he makes assumptions on why it became that funny in the end. Finally, he reaches the conclusion that the interpreter must have abandoned her studies of German at an early stage. But in the end, he does not know whether this was

¹⁴⁶DeReKo: NUN06/JUN.00086 Nürnberger Nachrichten, 01.06. 2006.

¹⁴⁷DeReKo: HMP08/MAR.01378 Hamburger Morgenpost, 14.03. 2008.

¹⁴⁸DeReKo: RHZ98/MAR.02115 Rhein-Zeitung, 02.03. 1998.

¹⁴⁹DeReKo: BRZ09/MAR.10889 Braunschweiger Zeitung, 21.03. 2009.

indeed the cause of the humorous situation. According to this, the adverbial clause encodes an epistemically modified cause otherwise represented as ASSUMPTION (CAUSE (P)).

It is important to keep these epistemically modified causes apart from epistemic *weil*-sentences. Whereas in the first case the speaker makes a hypothesis *q* about the possible causes for the fact *p*, the speaker renders the justification *q* which makes him assume the hypothesis *p* in the latter case. In short, in the one case, the matrix clause expresses a fact while the adverbial clause expresses an assumption, providing a *fact-hypothetical cause* reading, in the other case, the matrix clause expresses an assumption while the adverbial clause expresses a fact, providing a *hypothesis-factive cause* reading.

Finally, epistemic modal verbs and causal operators are attested in a third configuration in which the deictic centre is neither identical to the speaker nor to an argument of the matrix predicate but with another salient referent.

- (175) Seine vermeintliche Komplizin muss mit bis zu zehn Jahren rechnen, weil
 his putative accomplice has.to with up to ten years calculate because
 sie Menschenhandel zum Zwecke der sexuellen Ausbeutung in dem
 she human.trafficking for sake the-GEN sexual-GEN exploitation in the
 Bordell betrieben haben könnte ¹⁵⁰
 brothel run-PPP have-INF could
 ‘His alleged accomplice will have to face a prison sentence of up to ten years because
 (according to the court’s assessment) she could have run a brothel for the sake of human
 trafficking and sexual exploitation.’

Even if the deictic centre is not explicitly expressed, there is no doubt that the epistemic operator can be attributed to an identified referent. In view of the two types of configurations that have already been discussed here, there are two possible interpretations. According to the first type, the epistemic modal does not take scope over the cause operator, resulting in a *fact-factive cause* reading: the speaker knows that the accomplice will have to face a prison sentence and he knows that the cause for this because the court considers it possible that the accomplice might have run an illegal brothel. According to the second type, the epistemic modal takes scope over the cause operator resulting in a *fact-hypothetical cause* reading: The speaker knows that the accomplice will have to face a prison sentence and he assumes that the cause for this could be that she run an illegal brothel. As it is obvious, only the first interpretation is appropriate. Correspondingly, the third configuration also belongs to the *fact-factive cause* type. The essential difference with respect to the first type discussed above is that the matrix predicate in the third type does not provide an argument which is suitable to be identified with the deictic centre. However, the absence of an appropriate argument does not affect acceptability of the epistemic modal verb embedded in the *weil*-clause. Instead, the deictic centre is identified with some other referent salient from discourse.

This leads us to the question of how the identification of the deictic centre is guided. Is it guided by particular rules? Is it completely arbitrary? The configuration which involves a suitable matrix argument provides a perfect scenario in order to decide this question: in case the identification of the deictic centre is completely unrestricted, the presence of a potential should

¹⁵⁰DeReKo: RHZ07/AUG.16190 Rhein-Zeitung, 17.08. 2007.

not prevent the deictic centre from being co-indexed with a referent different to the one encoded by the matrix predicate. Turning back to the *fact-factive cause* interpretations in (163) and (164), it would be expected then that the deictic centre in these examples could be instantiated by some other referent than the one encoded by the matrix subject. However, such an interpretation does not seem to be available. In a similar fashion, the deictic centre always appears to be linked to the speaker whenever an epistemic modal occurs in a matrix clause.

The identification of the deictic centre seems to be arbitrary, as long as there is no other plausible candidate encoded in the respective clause. This is supported by the observation which has been made by Zimmermann (2004, 265) for the discourse particle *wohl*, which cannot take scope out of an embedded clause in the presence of a potential candidate encoded by some argument in the matrix clause. The precise rules of identification will be more thoroughly addressed in Section 8.

Once more, it turns out that event related *weil*-clauses can contain epistemic modal verbs that do not belong to the typical exponents of objective epistemic modality, such as *mögen* and *könnte*. This indicates that the assumption of the category objective epistemic modality might be doubtful. In a similar fashion, further elements can be found in event related *weil*-clauses, which are interpreted with respect to the speaker such as the discourse particle *wohl*, as it has been pointed out by Zimmermann (2004, 261). Again, discourse particles such as *wohl* are not elements that are attributed an objective epistemic interpretation.

- (176) Jeder von den Arbeitern wurde entlassen, weil die Fabrik wohl dichtgemacht
 each of the workers was fired since the factory wohl make.sealed
 wird.
 PASS.AUX
 ‘Each one of the workers was fired since the factory will presumably be shut down.’

The corresponding interpretation for (176) is the *fact-hypothetical cause* reading. In an appropriate context, a *fact-factive cause* would also be possible. Asbach-Schnitker (1977, 48) discusses a similar example of *wohl* in a *weil*-clause. According to her view, *wohl* in *weil*-clauses only allows for a *fact-hypothetical cause* interpretation, a *fact-factive cause* reading should be ruled out. Likewise, speaker oriented adverbs are also compatible with *weil*-clauses, such as the epistemic adverb *vielleicht* ‘maybe’. They can occur in event related *weil*-clauses conveying either of the two interpretations, as the example given by Roland Schäfer (pers. commun.) illustrates:

- (177) Weil Peter vielleicht das Eis aufgegessen hat, hat ihn Maria verprügelt.
 Because Peter maybe the ice.cream eaten has has him Maria bashed
 ‘Because Peter has possibly eaten all the ice cream, Maria bashed him’
 ‘I assume that it was because Peter has eaten all the ice cream that Maria bashed him’

As pointed out by Roland Schäfer (pers. commun), some speakers get a third interpretation, in which the epistemic adverb *vielleicht* takes scope over the matrix clause as well, resulting in a *hypothesis-hypothetical cause* reading. In this case of *Schäfer*-raising, the epistemic adverb acts as a modifier of the matrix clause.

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Inspired by examples provided by Lang (1979, 210), Nuyts (2001a, 78) has pointed out that epistemic adjectives and adverbs can occur in German *weil*-clauses. According to his view, each of them prefers a different interpretation.

(178) Peter trinkt noch einen Schnaps weil es wahrscheinlich ist, daß er süchtig
Peter drinks more one schnaps because it probable is that he addicted
ist.
is

‘Peter drinks another schnaps because it is probable that he is addicted’

(179) Peter trinkt noch einen Schnaps, weil er wahrscheinlich süchtig ist.
Peter drinks more one schnaps because he probably addicted is

‘Peter drinks another schnaps because he is probably addicted’

As Nuyts (2001a) assumes, epistemic adjectives are more likely to obtain a *fact-factive cause* reading (178), whereas epistemic adverbs being obligatorily interpreted with respect to the speaker are restricted to a *fact-hypothetical cause* reading (179).

As already demonstrated in example (177), Nuyts’ assumptions are wrong as there are adverbs that exhibit a *fact-factive cause* interpretation.

To sum up, it has once more turned out that ‘subjective’ epistemic operators are available in an environment in which they are expected to be exempt from. Embedded in event related *weil*-clauses which are part of a *fact-factive cause* configuration, they will typically induce a context shift. Whenever the matrix predicate introduces an appropriate argument, the deictic centre will share the same index. Otherwise, the deictic centre will be identified with some other referent salient from the discourse.

At this point, the question arises why epistemic modal operators which are embedded in adverbial clauses are acceptable in some cases whereas they are not in others. The easiest solution is probably to assume that different types of epistemic modal operators are involved: whenever they obtain an ungrammatical interpretation, they are ‘true subjective’ epistemic modal operators, whenever they are not they have to be something else, eg. ‘objective’ epistemic modal operators. But as it has been pointed out above, things are not so easy. There are numerous types of canonical ‘subjective’ epistemic operators which are attested in embedded clauses. Therefore, it becomes necessary to seek an alternative explanation. In the analysis elaborated on here, it is assumed that epistemic operators introduce a variable for a deictic centre. In order to obtain a grammatical interpretation, the deictic centre has to be identified with a referent. This process of identification underlies clear rules. Whenever the identification of the deictic centre conforms to these rules, the embedded epistemic modal operator can be interpreted, in any other case the interpretation fails and the entire sentence is ungrammatical. Again, it turns out that the assumption of an independent sub-category ‘objective’ epistemic modality does not neatly account for the phenomenon of embedded epistemic modal operators.

6.17 Excluded from the antecedent of an event related conditional

Lyons (1977, 799, 805) assumes that epistemic modal verbs are possible in the antecedent of a conditional, as long they obtain an 'objective' interpretation at least.

- (180) If it may be raining, you should take your umbrella.

Nevertheless, he concedes that utterances like that are "undoubtedly rare in English". The reason for this is that objective epistemic modality is expressed by other lexical means than verbs, for example patterns such as *it is possible that*. Subjective epistemic modality, however, is excluded from conditional clauses. This position is adopted by Aijmer (1978, 164), Drubig (2001, 11) and Papafragou (2006, 1690, 1697) for English, by Öhlschläger (1989, 209) for German, by Huitink (2008, 8 ex. (22)) for Dutch, by Nuyts (2001a, 211) for German and Dutch, and by Hengeveld (1988, 236) for Spanish.

Öhlschläger (1989, 209) argues that the acceptable examples in (181) contain 'objective' epistemic instances of German modal verbs. Following his perspective, the only modal verb in German that unambiguously involves a 'subjective' epistemic interpretation is *mögen*. Accordingly, Öhlschläger (1989) concludes that the ungrammaticality of (182) is caused by the illicit presence of a subjective epistemic modal verb which cannot be as 'objective' otherwise. In German, conditional clauses are most typically headed by the complementiser *wenn*:

- (181) Wenn der Angeklagte der Täter sein muß/dürfte/kann, wird er
if the accused the culprit be-INF must/might/can PASS.AUX he
inhaftiert.¹⁵¹
arrested
'If there are reasons to believe that the accused is the culprit, he will be arrested.'
- (182) * Wenn der Angeklagte der Täter sein mag, wird er inhaftiert.¹⁵²
if the accused the culprit be-INF may PASS.AUX he arrested.
'If there are reasons for me to believe that the accused is the culprit, he will be arrested.'

But as it has been shown in various occasions in the previous section, his reasoning lacks empirical justification. First of all, epistemic *mögen* is attested in a lot of environments in which an 'objective' epistemic modal should be banned from. Secondly, *mögen* is a modal verb that is not very frequent in Contemporary German and typically comes across with a complex concessive meaning which in turn requires a particular context. The reason why (182) is less acceptable than (181) might be rather due to its specific lexical semantic.

Generally speaking, epistemic modal verbs which are embedded in an antecedent of an event conditional are pretty hard to attest in corpora.¹⁵³ Interestingly, the investigated items *dürfte*,

¹⁵¹The acceptability judgements reflect those found in Öhlschläger (1989, 209). The translations given by myself reflect more or less his perspective.

¹⁵²The acceptability judgements reflect those found in Öhlschläger (1989, 209). The translations given by myself reflect more or less his perspective.

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kann, *könnte*, *mag* and *wird* are almost equally rare in this distribution. This confirms the assessment made by Lyons (1977, 806), who noticed that these uses are “undoubtedly rare”. Interestingly, there seems to be no considerable difference in the behaviour between those verbs which are considered as typical exponents of ‘objective’ epistemic modality such as *kann* and *dürfte* and those verbs that have not been regarded as ‘objective’ epistemic so far such as *mag*, *könnte* and *wird*. Once more, this is unexpected for an account that assumes a division of epistemic modality into an objective and subjective type.

The occurrences found in the corpus are almost exclusively embedded in antecedents of *even if* clauses, irrelevance conditionals and related phenomena. According to Sweetser (1990, 133), *even if*-clauses crucially differ from canonical conditionals since the consequent always remains true even if antecedent does not hold. Moreover, they also exhibit semantic peculiarities in that they additionally convey concessive meaning.

- (183) Wenn die Regierung zunächst noch geglaubt haben mag, mit einem raschen
if the government first still believe-PPP INF may, with a quick
Abschluß der Gehaltsrunde bei den Beamten die ausufernde
completion the-GEN collective.bargaining at the civil.servant the abundant
Malaise im öffentlichen Bereich eindämmen zu können, so muß sie nun die
malaise in.the public sector contain-INF to canINF so must she now the
anhaltende Verhärtung an der Sozialfront zur Kenntnis nehmen.¹⁵⁴
persistent rigidification at the social.front at knowledge take-INF
‘Even if the government may have first thought that it could have contained the abundant
malaise in the public sector, they have to acknowledge the persistent rigidification now at
the social front.’
- (184) Wenn es irgendwann einmal echte Einsparmöglichkeiten wegen
if it sometime once true economise.possibilities due.to
unwirtschaftlichen Verhaltens gegeben haben mag, so sind diese nach so
uneconomical behaviour give-PPP have-INF may, so are they after so
vielen Jahren längst ausgeschöpft.¹⁵⁵
many years long.ago exploited
‘Even if there might have been the potential to economise due to uneconomical behaviour,
they have already been exploited after so many years.’

¹⁵³The corpus study focussed on epistemic uses of *dürfte*, *könnte* and *kann*. Since modal verbs that embed perfect infinitives are most likely to be interpreted in an epistemic way, the queries were formulated accordingly:

wenn /+w5:15 (MORPH(V PCP PERF) sein dürfte) and wenn /+w5:15 (MORPH(V PCP PERF) haben dürfte)

The study encompassed the entire *W-TAGGED-öffentlich* archive being part of the DeReKo corpus.

¹⁵⁴DeReKo: P91/OKT.05347 Die Presse, 24.10. 1991.

¹⁵⁵RHZ08/MAR.19805 Rhein-Zeitung, 25.03. 2008.

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- (185) Wenn jemand noch Zweifel gehabt haben mag, daß die Europäische Union
 if anybody still doubts have-PPP have-INF may that the European Union
 Österreich unbedingt als neues Mitglied begrüßen will, so kann er diese jetzt
 Austria necessarily as new member greet wants so kann he these now
 begraben.¹⁵⁶
 bury
 ‘If anyone may have doubted the European Union accepting Austria as a new member at
 any rate, they needn’t entertain them further.’
- (186) Wenn es dem Orchester schon schwer gefallen sein mag, das Konzert
 If it the orchestra already hard fall-PPP be-INF may the concert
 fortzuführen, so ist vor allem Monika Baumgartners Vorstellung
 to.continue-INF so is above all Monika Baumgartner-GEN performance
 bemerkenswert, mit der sie in Mozarts Motette „Exsultate, jubilate” ihren
 remarkable with the she in Mozart-GEN motette exsultate jubilate her
 Solopart meisterte¹⁵⁷
 solo.part mastered
 ‘Even if it may have been hard for the orchestra to continue the concert, it is Monika Baum-
 gartner’s performance in particular that merits attention as to how she mastered Mozart’s
 motettes.’

Following Sweetser (1990, 123), Kratzer (1995, 130) and Haegeman (2002, 117) there are different types of conditionals which should carefully be distinguished: content/event related conditionals, epistemic conditionals and speech act conditionals, as it has been shown in Section 5.4.1. This differentiation also applies to German conditional clauses headed by the complementiser *wenn*. The restriction against epistemic modal operators in antecedents was evidently elaborated with respect to event related conditionals only, a similar observation has been made by Haegeman (2002, 126) and Haegeman (2006, 1652) for speaker oriented adverbs. In the antecedent of epistemic and speech act conditionals, however, speaker oriented operators are possible. All the conditional clauses in the examples (183)–(186) behave in a particular manner, the proposition expressed by the antecedent is presupposed or factive. As illustrated by Fabricius-Hansen and Sæbø (1983, 2), this behaviour is atypical for conditional clauses. The unambiguous conditional complementisers *falls* and *sofern* are not compatible with such an environment. As Haegeman (2002, 121, 126) and Eisenberg (2004, 346) state, conditional clauses that involve echoic antecedents cannot be considered as canonical event conditionals, rather they are peripheral or premise conditionals, which are closely related or even identical to epistemic or speech act conditionals.¹⁵⁸ Likewise, Declerck and Reed (2001, 83) point out, that echoic antecedents always an element of ‘suspending disbelief’ regarding the validity of its proposition. This is reminiscent of epistemic modifiers. For these reasons, the examples given above cannot be regarded as counter-examples to the restriction formulated by Lyons (1977, 806).

Finally, *wenn*-clauses in German introduce an additional layer of ambiguity: as Fabricius-Hansen and Sæbø (1983, 2) point out in much detail, the complementiser *wenn* can also head

¹⁵⁶DeReKo: N94/MAR.08289 Salzburger Nachrichten, 05.03. 1994.

¹⁵⁷DeReKo: RHZ08/NOV.22367 Rhein-Zeitung, 25.11. 2008.

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temporal adverbial clauses that express a partial simultaneity of the matrix Topic Time and the Topic Time of the adverbial clause of a single or repeated event. However, these cases can easily be identified since *wenn* can be replaced by the temporal complementisers *sobald* or *sooft*, as it will be illustrated in Section 6.18. Despite the multiplicity of interpretations, there are few examples of epistemic modals that occur in the antecedent of a potential event related conditional. Interestingly, they are all attested with *könnte* which is a verb that is not regarded as a typical exponent of objective epistemic modality.

- (187) Wenn der Täter bewaffnet sein könnte, würde ich jedoch dringend
if the offender armed be-INF could would I but strongly
abraten.¹⁵⁹
disadvise-INF
'If the offender could be armed, I would strongly advise against it.'
- (188) Es besagt, dass eine in die Schweiz geflüchtete Person nicht in ihr
it says that a in the Switzerland fled person NEG in his
Ursprungsland zurückgeschafft werden darf, wenn sie dort an Leib und
origin.country back.delivered PASS.AUX may if she there at body and
Leben bedroht sein könnte.¹⁶⁰
life threaten-PPP be-INF could
'It says that a person who has fled to Switzerland must not be returned to his original country
if he could be physically threatened there.'
- (189) Wenn in einem Unfall die Trunkenheit eine Rolle gespielt haben könnte, so
if in an accident the drunkenness a role play-PPP have-INF could so
sind Folgen auch bei einem Alkoholgehalt von unter 0,5 Promille
are consequences also with a alcohol.percentage of less 0.5 promille
möglich.¹⁶¹
possible
'If it is possible that the cause for an accident was drunkenness, then it possible that there
will be consequences even if the percentage of alcohol was less then 0.5 promille.'

Examples such as (187) are fully acceptable and they involve plausible candidates for event related conditional clauses. First of all, in each case the antecedent is non-echoic. Secondly, the replacement tests discussed by Fabricius-Hansen and Sæbø (1983, 2) succeed: in all of the cases, *wenn* can be replaced by less ambiguous conditional complementisers such as *falls* and *sofern*. The replacement by complementisers which are synonymous with the temporal interpretation of *wenn* such as *sooft* or *sobald* will obtain a result that is less acceptable.

¹⁵⁸The distinction appears to be intricate, as *falls* and *sofern* are attested as complementisers of both epistemic and speech act conditional, as it is shown in Section 5.4.1. But they appear to be less compatible with echoic antecedents, as Fabricius-Hansen and Sæbø (1983, 2) stress. The precise relationship between these two aspects remains to be elaborated.

¹⁵⁹DeReKo: RHZ96/OKT.04492 Rhein-Zeitung, 08.10. 1996.

¹⁶⁰DeReKo: A09/FEB.06666 St. Galler Tagblatt, 24.02. 2009.

¹⁶¹DeReKo:WPD/TTT.07396, Wikipedia, 2005.

As for the anchoring of the deictic centre, epistemic modal verbs embedded in event related conditional clauses crucially differ from most other adverbial clauses investigated here. Whereas epistemic modal operators in event related causal clauses and temporal clauses are typically linked to the speaker or in some cases to a matrix argument, the epistemic modal verbs in the three *wenn*-clauses are anchored to the addressee. This is most obvious in (187). The remaining examples are more complex. As with the matrix clause in (187), the matrix clauses in (188) and (189) reflect an advice or regulation. But whereas the addressee of that advice is the hearer in (187), the addressee of that advice is not present in the utterance situation in the other two examples. Interestingly, this is reminiscent of the manner the modal source of circumstantial modal verbs is anchored. As Leech (1971, 72) has illustrated, the modal source typically tends to be identified with the speaker in declarative clauses, it is rather identified with the addressee in questions and antecedents of conditionals. The parallel behaviour of questions clauses and antecedents of conditional clauses is exactly what is expected as there is a systematic relation between these two types of clauses, as it has been demonstrated by Traugott (1985), Zaefferer (1987), Bhatt and Pancheva (2006, 653) and Reis and Wöllstein (2010, 133–135). The analysis presented here equally captures the examples in (181) provided by Öhlschläger (1989, 209). Though being more opaque, (189) could be interpreted in a similar manner, if it is felicitous at all.

The examples given above involve an additional peculiarity. Canonical event conditionals establish a relation between two events: *If you drop that bottle, it will break*. However, this is not the case in the examples above. The matrix clause is not interpreted as a mere assertion of a state of affairs, but rather as an advice or directive. Note that a modified matrix clause could be easily replaced with an imperative without affecting the interpretation too much: *If the offender is armed, let him go!* This could be an indicator that the *wenn*-clauses modifies the entire speech act in (187)–(189).

These two observations raise some serious doubt as to whether the conditionals in the examples above could really be considered as genuine event related conditionals. It is fairly likely that the conditionals under discussion here turn out to be speech act conditionals. Unless there is clear proof that reveals the opposite, these patterns will not be considered as event conditionals in this study.

Yet, there is one other type of data, in which the conditional is embedded in a hypothetical context (*potentialis*).

- (190) Am Ende könnte die Linkspartei über solche Bündnisse ein starker Faktor
 at.the end can-SBJV.PST the Linkspartei by such alliances a strong factor
 im Bundesrat werden – und dies wäre vor allem von Gewicht,
 in.the Federal.Council become and this be-SBJV.PST of all of weight
 wenn die Bundesregierung nach der Bundestagswahl schwarz-gelb geprägt
 if the government after the election black-yellow coin-INF
 sein könnte.¹⁶²
 be-INF can-SBJV.PST

‘Finally, the Leftwing-party could profit from such alliances in the federal council – this would become important if after the next election the government could be coined by a

black-yellow coalition.’

The last example (190) is perfectly acceptable. It deserves closer attention, that it is embedded in a hypothetical context, which is illustrated by the fact that each finite verb is inflected for past subjunctive. As it appears, the acceptability of that examples hinges on the specification for subjunctive, as it would become less grammatical if the subjunctive was replaced by indicative morphology. There is no apparent reason to assume that the epistemic modal verb in (190) is not ‘subjective’ since it has to be more plausibly interpreted as a conjecture made by the speaker. It seems then that hypothetical contexts licence epistemic modal operators in antecedents of event related conditionals. In these contexts, it appears to be possible that the deictic centre is identified with the speaker.

Do, then, event related conditionals provide evidence for the existence of objective modals? Under extremely specific conditions, antecedents of event related conditionals can embed epistemic modal verbs. An interpretation with a deictic centre identical to the speaker is possible in a hypothetical context, as illustrated in (190). Since hypothetical contexts introduce additional operators, their precise interaction yet remains to be thoroughly investigated.

Likewise, the examples given by Lyons (1977, 805) and Papafragou (2006, 1692) provide no evidence for the existence of objective epistemic modification. First of all, as has been demonstrated above, the conditional in example (180) exhibits a striking resemblance with conditionals that modify directive speech acts, such as imperatives: *If it may be raining, take an umbrella!*. The close functional relationship between the modal *should* (and its cognates in German) and directives has been pointed out at various occasions, cf. Glas (1984, 10), Reis (1995, 2003). If these examples do indeed turn out to be speech act conditionals, their acceptability can easily be accounted for. Since antecedents of epistemic and speech act conditionals are far less restrictive than those of event related conditionals, they can even host speaker related operators. In this respect, it resembles the examples (187)–(189). Moreover, the antecedent is evidently specified for the present and is echoic, that is, it refers to an utterance which has already been stated by somebody else in prior discourse. As indicated by Fabricius-Hansen and Sæbø (1983, 8), Declerck and Reed (2001, 83) Haegeman (2002, 121, 126) and Eisenberg (2004, 346), both properties are clear indicators that the conditional is not an event related one. A similar reasoning applies to the example provided by Papafragou (2006, 1696): the antecedent seems to become more acceptable if it is interpreted as echoic.

(191) If Paul may get drunk, I am not coming to the party.

Once more, the discourse particle *wohl* seems to pattern in the very same way, as epistemic modal verbs. First of all, Zimmermann (2004, 265) observes that it is not acceptable in antecedents of event related conditionals.

(192) * Wenn der Smutje wohl betrunken ist, gibt es heute keinen Labskaus.
 if the smutje wohl drunk is gives it today no Labskaus
 ‘Intended reading: If the cook is presumably drunk (as I assume), there will be no Labskaus.’

¹⁶²DeReKo: HAZ09/AUG.02799 Hannoversche Allgemeine, 18.08. 2009.

Secondly, it frequently occurs with *even if* clauses and other types of so-called irrelevance conditionals. Thirdly, it is conceivable that *wohl* occurs even in antecedents of event related conditionals analogous to (181) and (188).

In a similar fashion, Haegeman (2006, 1652) reports that speaker oriented adverbs cannot be embedded in event related conditionals. Then, the general picture is that operators which involve a deictic centre seem to be almost excluded from antecedents of event related conditionals. The reason is obvious: the deictic centre has to be identified with some referent. This process of identification, however, is not arbitrary but driven by specific principles. Whenever an epistemic operator is contained by an embedded complement or adverbial clause, it is harder to retrieve a suitable candidate that can be identified as a deictic centre. If there is no plausible way to provide a deictic centre for the embedded epistemic modal operator, the utterance is ungrammatical.

The incompatibility of epistemic modal verbs with antecedents of event related conditionals might also be related to the observation made by Kratzer (1995, 130) who has pointed out that event related *when*-clauses in English are no suitable hosts for stative verbs. Since modal predicates encode states of beliefs they might be affected by this restriction as well.

6.18 Excluded from temporal clauses

Aijmer (1978, 164) argues that epistemic modal auxiliaries in English cannot be embedded in temporal clauses. This is a very general restriction as there are a lot of different types of temporal subordinators. The purpose of temporal adverbial clauses is to relate two time intervals: the Topic Time determined by the event expressed by the adverbial clause and the Topic Time determined by the event expressed by the matrix clause. There are different instantiations. According to Eisenberg (2004, 339), the most important temporal subordinating conjunctions for German are *nachdem* 'after' expressing the posteriority of the matrix Topic Time, *bevor* 'before' anteriority of the matrix Topic Time, *während* 'while' expressing a simultaneity or temporal overlap of the matrix Topic Time and the Topic Time conveyed by the temporal clause, *als* 'when' expressing a simultaneity or temporal overlap of these two Topic Time intervals that are located prior to the Time of Utterance and, finally, *wenn* 'when' that also expresses a simultaneity or temporal overlap of these two Topic Time intervals without specifying whether this simultaneity has occurred only once or occurs generically. Furthermore, there are a couple of temporal conjunctions that behave in a slightly different manner. An adverbial temporal clause headed by *bis* 'until' expresses a potential termination of the state of affairs expressed by the matrix clause. In contrast, adverbial clauses headed by *seit* and *seitdem* 'since' refer to the beginning of the state of affairs expressed by the matrix clause.

As it turns out, epistemic modal verbs are only rarely attested in temporal clauses in the German DeReKo corpus.¹⁶³ The precise frequency of these occurrences depends on the type of temporal clause and on the specific epistemic modal verb. Unfortunately, there is a circumstance that complicates this endeavour. Most of the subordinators that introduce temporal clauses are ambiguous. Aside from the temporal interpretation, they often involve an additional causal, contrastive, conditional or comparative interpretation, depending on the respective lexical item. Similar observations about potential ambiguities of temporal conjunctions have been made by Eisenberg (2004, 339) and Coniglio (2008, 195) for German and Haegeman (2002, 137, 142)

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for English. It is necessary to distinguish between the different interpretations since, in some cases, they come along with very different syntactic properties. As demonstrated by Haegeman (2002, 137, 142), *while* in its temporal interpretation heads an event related (central) adverbial clause, whereas it heads a speech act related (peripheral) adverbial clause in its contrastive interpretation. This has been discussed in more detail in Section 5.4.5. Similar effects can be observed with other temporal conjunctions as well. In the investigation discussed here, these non-temporal interpretations are carefully kept apart.

Apart from the expression of the posteriority of matrix Topic Time, *nachdem* ‘after’ additionally involves an event related causal interpretation. However, in its temporal use, it rarely heads an adverbial clause that contains an epistemic modal verb:

- (193) Der 15 Monate alte Christoph I. fiel in den umzäunten Teich vor dem
 the 15 month old Christoph I. fell in the fenced pond in front of the
 Elternhaus, nachdem er selbst das Tor des Zaunes geöffnet haben
 parental.home after he self the gate the-GEN fence-GEN open-PPP have-INF
 dürfte.¹⁶⁴
 might
 ‘The 15 month old Christoph I fell in the fenced pond in front of the parental home after he
 may have opened the gate of the fence by himself.’
- (194) Im Frauenwieserteich ertrank am 19. August 2001 ein 16-jähriges Mädchen,
 in.the Frauenwieserteich drowned on 19 August 2001 a 16.year.old girl
 nachdem es beim Schwimmen in Panik geraten sein dürfte.¹⁶⁵
 after it at swim-INF.NOUN in panic get-PPP be-INF might
 ‘A 16 year old girl drowned on 19th August in the Frauenwieserteich after possibly running
 in a panic.’
- (195) Sie soll mit falschen Fünfzig-Euro-Scheinen mehrfach in der Siegstadt
 she shall with false fifty.Euro bill repeatedly in the
 eingekauft haben. Dies, so der Vorwurf, auch nachdem sie gewusst
 Siegstadt shop-PPP have-INF this so the reproach also after she
 haben muss, dass es sich um Blüten handelte.¹⁶⁶
 know-PPP have-INF must that it REFL about counterfeit.money dealt
 ‘She is claimed to have repeatedly paid in Siegstadt with false fifty Euro bills. Accord-
 ing to a reproach, she continued doing so even after she must have known that they were
 counterfeit money.’

¹⁶³The investigation was carried out in July 2011. Since the majority of epistemic modal verbs select stative complements, in particular *sein* and *haben* the study was based on queries such as ((, ODER .) bis) /+w15 (sein könnte) ((, ODER .) seit) /+w15 (haben dürfte). The investigation involved each type of epistemic modal verb, either type of stative predicate and all of the temporal subordinators discussed above.

¹⁶⁴DeReKo: O94/JUL.61763 Neue Kronen-Zeitung, 03.07. 1994.

¹⁶⁵DeReKo: NON07/AUG.03400 Niederösterreichische Nachrichten, 08.08. 2007.

¹⁶⁶DeReKo RHZ04/APR.11451 Rhein-Zeitung, 14.04. 2004.

As already illustrated in Section 6.3 and 6.16, epistemic modal operators introduce an additional time interval: the Time of Evaluation in which the deictic centre evaluates the embedded proposition with respect to its validity. In the canonical case, the function of a temporal conjunction is to relate the Topic Time of the matrix clause to the Topic Time of the temporal clause. Since the Time of Evaluation introduced by an epistemic modal operator takes always scope over the Topic Time provided by the embedded predicate, it is not obvious as to what time interval will be affected when a temporal clause embeds an epistemic modal verb: the Topic Time of the predicate or the Time of Evaluation.

In the examples given above, *nachdem* always refers to the Topic Time of the adverbial clause but never to the Evaluation Time specified by the modal verb. In its temporal use, a clause headed with *nachdem* specifies some time interval prior to the Topic Time of the matrix clause. As, for example (193), this time interval is clearly the one for which it is assumed that Christoph opened the door himself rather than the one in which the deictic centre makes the assumption about Christoph. Nevertheless, the interpretation of these examples remains somewhat peculiar since they involve a matrix Topic Time that is related to a Topic Time that is not linked to any factive event or state. The deictic centre does not know whether the event related to the Topic Time of the temporal clause really exists. As for most of the examples discussed above, the identification of the deictic centre is fairly obvious: it is anchored to the speaker. This is not so clear for example (195), which contains a reported reproach. In this context, the original assumption is attributed to a referent that is different from the actual speaker. But as the entire clause is in the scope of the parenthesis *so der Vorwurf* ‘according to the reproach’ it becomes clear that this is another instance of context shift. What is attributed to the third referent is not only the assumption but the entire utterance, the entire speech act. Accordingly, the parenthesis marks the clause as having been uttered by another speaker. In this original utterance, speaker and the deictic centre introduced by the modal verb are again identical.

Aside from its event related temporal interpretation that expresses the anteriority of the matrix Topic Time, *bevor* ‘before’ alternatively operates on speech act level. In the latter case, it obviously expresses the anteriority of the matrix Time of Utterance with respect to the Topic Time linked to a potential event in the future, similar observations have been made by Coniglio (2008, 195), as it has been shown in Section 5.4.7. Event related *bevor*-clauses that contain epistemic modal verbs are very hard to find in the DeReKo corpus. Nevertheless, they exist.

- (196) Anfangen hat es in Minute 30, als der Ball zweimal auftickte, bevor
 began hat it in minute 30 when the ball two.times up.jumped before
 Torwart Frank Maximini sich wie der zweite Teil seines Nachnamens
 goal.keeper Frank Maximini REFL as the second part his-GEN family.name-GEN
 geföhlt haben dürfte.¹⁶⁷
 feel-PPP have-INF might
 ‘It began after 30 minutes, when the ball jumped twice, before the goal keeper Frank Maximini must have felt like the second part of his family name.’
- (197) Ich wollte noch rechtzeitig alles Wissenswertes aus der Geschichte
 I wanted yet in.good.time everything worth.knowing of the history

¹⁶⁷DeReKo: RHZ97/SEP.03529 Rhein-Zeitung, 05.09. 1997.

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unserer Gemeinde aufschreiben, bevor es vielleicht zu spät sein könnte¹⁶⁸
 our-GEN community down.write before it maybe too late be-INF could
 ‘I just wanted to write down the most important facts about the history of our community before it may be too late.’

- (198) Doch auch wenn alles gutgeht, werden mehr als fünf Jahre sowie 75
 but even if everything good.goes will more than five years as.well 75
 Flüge zu der „Großbaustelle im Weltraum“ vergehen, bevor das
 flights to the construction.site in.the space pass before the
 spektakulärste Gemeinschaftsprojekt der Wissenschaftsgeschichte im
 most.spectacular common.project the-GEN science.history in.the
 Juni des Jahres 2002 zusammengebaut sein könnte.¹⁶⁹
 June the-GEN year-GEN 2002 assemble-PPP be-INF could.
 ‘Even if everything goes well, more than five years and 75 flights to the “construction site in space” will elapse before the most spectacular joint project in the history of science may possibly be assembled in June 2002.’

Once again, the relevant time interval that is affected by the subordinate conjunction *bevor* is the Topic Time of the temporal clause rather than the Time of Evaluation introduced by the epistemic modal verb. In example (197), the interval that is interpreted as being after matrix Topic Time is the time ‘when it is too late’ rather than the Time of Evaluation when the deictic centre reaches the conclusion that it is possibly too late. As in the cases of *nachdem*, the deictic centre is anchored to the speaker referent.

In the canonical case, *während* indicates simultaneity or an overlap of the matrix Topic Time and the one attributed to the temporal clause. However, it is also frequently used as a contrastive conjunction, just as its English counterpart *while*. In the DeReKo corpus, only one example of a temporal *während*-clause with an epistemic modal verb is attested which selects a past related complement. Its precise status remains unclear.

- (199) Im Lokal habe er – während er reichlich Alkohol getrunken haben dürfte
 in.the bar has he while he abundantly alcohol drink-PPP have-INF might
 – bereitwillig jedem Gast seine Waffe gezeigt.¹⁷⁰
 voluntarily every guest his weapon show-PPP
 ‘In the bar he showed everybody his weapon while he (presumably) drank alcohol in abundant quantities.’

Again, the temporal conjunction concerns the Topic Time of the temporal clause rather than the Time of Evaluation introduced by the epistemic modal verb, again, the deictic centre is identified with the speaker.

Yet, it is not clear whether the clause headed by *während* in (199) is indeed temporally subordinate or rather to be seen as parenthesis. Coniglio (2008, 195) discusses similar instance of a *während*-clause that contains the discourse particle *wohl* provided by Asbach-Schnitker (1977,

¹⁶⁸DeReKo: RHZ05/JUL.10477 Rhein-Zeitung, 09.07. 2005.

¹⁶⁹DeReKo: RHZ97/JAN.02587 Rhein-Zeitung, 07.01. 1997.

¹⁷⁰DeReKo: N98/SEP.34596 Salzburger Nachrichten, 08.09. 1998.

48), concluding it is a non-restrictive relative clause that cannot be considered as temporal adverbial clause.

Aside from its temporal interpretation, *als* can also head comparative clauses. In the DeReKo corpus, temporal uses that contain epistemic modal verbs are hardly attested.

- (200) Danach habe ihn die Frau beispielsweise in den Hals gebissen, als es
 accordingly has him the woman for.instance in the throat bite-PPP when it
 nach einem heftigen Streit zu tätlichen Auseinandersetzungen gekommen
 after a fierce argument to violent hassle come-PPP
 sein dürfte.¹⁷¹
 be-INF might
 ‘Accordingly, the woman bit him in the throat when a fierce argument presumably ended up
 in a violent fight.’

As in the other cases, the relevant interval for the interpretation of temporal conjunction *als* is the Topic Time of the temporal clause rather than the Time of Evaluation of the modal verb. Likewise, the deictic centre is anchored to the speaker.

Among temporal clauses that contain epistemic modal verbs, *bis*-clauses are the most frequently attested. This might have pragmatic reasons. Temporal *bis*-clauses typically refer to a time interval in the future. Since the future is less clear and based on rather unstable predictions, it is much more compatible with a kind of reasoning as it is reflected by an epistemic modal operator.

- (201) Außerdem wird es noch Jahre dauern, bis die Brücke verwirklicht sein
 moreover will it yet years last until the bridge realise-PPP be-INF
 könnte.¹⁷²
 could
 ‘Moreover it will take years until the bridge may be realised.’
- (202) Keiner guckt auf die Uhr, bis plötzlich – huch! – irgendwer daran gedreht
 nobody watches at the clock until suddenly oops somebody on.it turn-
 haben muss, und dann geht es hopplahopp.¹⁷³
 have- must and then goes it hopplahopp
 ‘Nobody cares about the clock until – oops! – someone must have turned it on and then it
 goes hopplahopp.’
- (203) Und noch immer bewegt sich diese Düne näher an den Turm heran, bis er
 and still always moves REFL this dune closer to the tower towards until he
 wohl in ein paar Jahren völlig versandet sein dürfte.¹⁷⁴
 maybe in a couple years completely silt-PPP be-INF might
 ‘And the dune keeps moving towards the tower until, in a couple of years, it may be entirely
 silted.’

¹⁷¹DeReKo: M06/MAR.22418 Mannheimer Morgen, 24.03. 2006.

¹⁷²DeReKo: RHZ05/JUL.15241 Rhein-Zeitung, 13.07. 2005.

¹⁷³DeReKo: A09/SEP.06557 St. Galler Tagblatt, 19.09. 2009.

¹⁷⁴DeReKo: N93/OKT.38960 Salzburger Nachrichten, 23.10. 1993.

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Again, the temporal conjunction *bis* ignores the Time of Evaluation introduced by the epistemic modal operator. Instead, it is again the Topic Time of the temporal clause that serves as the temporal reference for the matrix Topic Time. In correspondence with the behaviour of the temporal clauses discussed so far, the deictic centre is instantiated by the speaker referent in these examples.

Temporal *seit*-clauses that embed epistemic modal verbs occur at a very low rate in the DeReKo corpus:

- (204) Aber Frust habe er auch wieder keinen, Zumindest seit Silverstone nicht, but frustration have he also again none at.least since Silverstone NEG obwohl ihn das Pech verfolgt, seit er mit dem verbesserten even.though him the misfortune follow since he with the enhanced Benetton technisch wie fahrerisch auf der Überholspur sein könnte.¹⁷⁵ Benetton technically as driver.cally on the overtaking.track be-INF could 'Again, he does not feel frustrated with respect to his driving skills, at least since Silverstone, even though he was not lucky from the time onwards since he may be on the overtaking track with his enhanced Benetton with respect to his driving skills and the technical equipment.'
- (205) Es ist derzeit allgegenwärtig, seit das Land seine Pläne zu einer Gebietsreform it is currently omnipresent since the land its plans to a reform vorgestellt hat und Rhens betroffen sein könnte.¹⁷⁶ presented has and Rhens concern-PPP be-INF could 'It is currently omnipresent since the time when the land has presented its plans for a reform of the local government and Rhens could be concerned.'

In correspondence with the patterns discussed so far, the temporal conjunction *seit* refers to the Topic Time of the temporal clause rather than to the Time of Evaluation that is introduced by the epistemic modal verb. The deictic centre is anchored to the speaker referent.

Finally, a couple of instances of epistemic modal verbs could be found which occur in *wenn*-clauses which are potentially interpreted as temporal clauses. They display similar properties as generic temporal *wenn*-clauses that refer to repeated events. In correspondence, the replacement with synonymous temporal conjunctions (*sobald*, *sooft*) obtains far more appropriate results than the replacement with conjunctions that reflect the conditional semantics (*sofern*, *falls*), as it has been illustrated by Fabricius-Hansen and Sæbø (1983, 2).

- (206) „Wenn etwas los sein könnte, rufen die hier an und machen uns die whenever something slack be-INF could call they here on and make us the Hölle heiß“, heiße es bei einem Dax-Konzern.¹⁷⁷ hell hot calls it at a DAX-concern '“Whenever it appears that something is going on, they call us and give us hell” that’s what people from a DAX-concern report.'

¹⁷⁵P96/SEP.35113 Die Presse, 20.09. 1996.

¹⁷⁶DeReKo: RHZ09/APR.00262 Rhein-Zeitung, 01.04. 2009.

¹⁷⁷DeReKo: NUN05/JUN.01555 Nürnberger Nachrichten, 14.06. 2005.

- (207) Der Staatsanwalt ordnet eine Obduktion an, wenn es sein könnte
 the public.prosecutor mandates a autopsy on whenever it be-INF could
 oder fest steht, dass ein Mensch eines unnatürlichen Todes gestorben ist.¹⁷⁸
 or firm stands that a man a unnatural death die-PPP is
 ‘The public prosecutor mandates an autopsy whenever it is possible or certain that a man
 has died from a non-natural death.’

Nevertheless, instances such as those given above are very hard to attest, only *könnte* could be found in these environments. This reflects more or less the situation for conditionals, as it is illustrated in Section 6.17. In contrast to the other temporal clauses, the temporal conjunction *wenn* affects the Time of Evaluation of the subordinate clause rather than its Topic Time as the correct circumscription for (206) is: *Whenever the deictic centre assumes that something is going on they call us*. Moreover, the deictic centre in the examples (206)–(207) is not anchored to the speaker, but is obviously to the matrix subject referent. In this respect, they are reminiscent of conditional *wenn*-clauses, as it has been demonstrated in Section 6.17. This specific behaviour of epistemic modal verbs in temporal *wenn*-clauses could be due to the generic interpretation *wenn* displays in both examples above. Crucially, the two *wenn*-clauses in the examples above cannot obtain the interpretation that refers to a single event.

In nearly all of the cases discussed above, the epistemic modal operator is clearly anchored to the speaker. The only exceptions are epistemic modal verbs that occur in generic temporal *wenn*-clauses. However, in either case, the epistemic modal verbs embedded in temporal clauses involve a clearly defined deictic centre and as a consequence they are rather interpreted in a ‘subjective’ way than in an ‘objective’.

The very restricted compatibility of epistemic modal verbs with temporal clauses turns out to be a very expressive characteristic for the nature of these verbs. This is not surprising, since they are excluded from event related conditional clauses which are semantically related. Interestingly, it has been ignored in the discussion about epistemic modal verbs since it was briefly mentioned by Aijmer (1978, 164). In contrast, this criterion has been invoked for the characterisation of modal particles. As Coniglio (2008, 194) argues, modal particles are items that are interpreted with respect to the speaker and therefore require a clause that has independent illocutionary force. Following Haegeman (2002, 137), he assumes that temporal clauses lack an independent illocutionary force and as a consequence they are not suitable hosts for speaker oriented operators.

Moreover, the poor acceptability of epistemic modal verbs in temporal clauses could also be related to a circumstance that plays a role in their incompatibility with event related conditional clauses. As Kratzer (1995, 130) points out, *when*-clauses in English are no suitable hosts for stative verbs. This behaviour seems to extend to most temporal clauses as well. This could explain why epistemic modal verbs are not readily compatible with these contexts: encoding mental states, they exhibit an affinity to stative predicates.

It merits closer attention, that among all the epistemic modal verbs in German there are two which are significantly more frequently attested in temporal clauses than the rest: *dürfte* and to some lesser extent *könnte*. This could be an important clue in identifying the particular meaning

¹⁷⁸DeReKo: NUN05/JAN.01398 Nürnberger Nachrichten, 15.01. 2005.

of these two items.

6.19 Excluded from restrictive relative clauses

Aijmer (1978, 164) claims that epistemic modal auxiliaries in English do not occur in restrictive relative clauses, but only in non-restrictive relative clauses. Again, she does not provide a single example that illustrates her hypothesis nor does she give a reason as to why epistemic modal operators should behave in this particular manner. Likewise, Krämer (2005, 24) argues that epistemic *werden* is excluded from restrictive relative clauses. Contrary to their claims, epistemic modals are broadly attested in restrictive relative clauses in German. In the DeReKo corpus various lexical items can be found in these contexts, such as *muss* in (208)–(209), *dürfte* in (210)–(211), *mag* in (212) and *wird* in (213).

- (208) Die Woltwiescher Kirche ist mehr als 850 Jahre alt, der Name, den
 the Woltwieschian church is more than 850 years old the name REL.PRN.ACC
 das Gotteshaus gehabt haben muss, ist nicht mehr in Erinnerung.¹⁷⁹
 the god.home have-PPP have-INF must is NEG more in memory
 ‘The Woltwieschian Church is more than 850 years old, the name that must have been
 attributed to it has been forgotten.’
- (209) Aufgrund der am Unfallort gefundenen Spuren dürfte es sich beim
 because the at.the accident.place found traces might it REFL by.the
 Fahrzeug um einen weissen Citroën BX handeln, der vorne
 vehicle about a white Citroën BX deal-INF REL.PRN.NOM in.the.front
 links sowie hinten beschädigt sein muss.¹⁸⁰
 left as.well.as in.the.back damage-PPP be-INF must.
 ‘According to the traces left at the place of the accident, the car may have been a white
 Citroën BX which should be damaged in the front on the left side and in the back.’
- (210) Das Öl verloren hat vermutlich ein Pkw, dem beim Abbiegen
 the oil lost has presumably a car REL.PRN.DAT by.the turn-INF.NOUN
 von der Kesselstraße in die Dammstraße ein Öldruckschlauch geplatzt sein
 from the Kesselstraße in the Dammstraße a oil.pressure.pipe burst-PPP be-INF
 dürfte.¹⁸¹
 might
 ‘The oil was lost by a car in which a oil pressure pipe might have been burst while turning
 from Kesselstraße into Dammstraße.’
- (211) Die Erben haben Gründe, die der Verstorbene in seiner
 the heirs have reasons REL.PRN.ACC the deceased in his
 Unergründlichkeit geahnt haben dürfte.¹⁸²
 inscrutability guess-PPP have-INF might

¹⁷⁹BRZ08/MAI.07291 Braunschweiger Zeitung, 15.05. 2008.

¹⁸⁰DeReKo: A98/JAN.04926 St. Galler Tagblatt, 26.01. 1998.

¹⁸¹DeReKo: V99/OKT.47532 Vorarlberger Nachrichten, 05.10. 1999.

‘The heirs have motives that the deceased might have guessed in his inscrutability.’

- (212) Jedem, der bislang vielleicht noch Verständnis für die Forderungen
 everyone REL.PRN.NOM so.far maybe still sympathy for the demands
 der GDL gehabt haben mag, muss spätestens jetzt klar geworden sein,
 the-GEN GDL have have may must at.the.latest now clear become-PPP be-INF
 um was es bei diesem Konflikt inzwischen geht.¹⁸³
 about what it by this conflict meanwhile goes
 ‘Anybody who may have still had sympathy for the demands by the GDL should know by
 now what this conflict is really about.’

- (213) Der Chef der Drogeriemarktkette dm war zu Gast in Wissen – und
 the boss the-GEN drugstore.chain dm was at host in Wissen and
 präsentierte eine Idee, die auf viele Zuhörer ziemlich revolutionär
 presented a idea REL.PRN.NOM on much listeners very revolutionary
 gewirkt haben wird.¹⁸⁴
 affect-PPP have-INF will
 ‘The boss of the drugstore chain “dm” was invited onto the radio transmission “Wissen” and
 he presented an idea that might have sounded like a revolution for most of the audience.’

Even if Aijmer (1978, 164) has not empirically supported her claim, it seems plausible in the light of a couple of more recent studies. Haegeman (2002, 166) and Coniglio (2008, 206, 214) argue that only non-restrictive relative clauses have an independent illocutionary force which renders them as a suitable host for expressions that are evaluated with respect to the speaker, whereas restrictive relative clauses lacking an independent illocutionary force cannot contain speaker related items, such as modal particles. Nevertheless, there is overwhelming empirical evidence that these claims are not true, there are numerous occurrences of epistemic modal verbs embedded in restrictive relative clauses. In all the cases above, there is a clearly defined deictic centre which is anchored to the speaker referent.

As Asbach-Schnitker (1977, 46) has pointed out, the situation is parallel with the speaker oriented discourse particle *wohl*. Above all, this concerns restrictive relative clauses that modify a NP index that lacks an established reference, as it is illustrated in (214). A similar example taken from the DeReKo corpus is provided by Zimmermann (2004, 280), as shown in (215):

- (214) Den Schlüssel, den du dort wohl finden wirst, wird dir
 the key REL.PRN.ACC you there maybe find-INF will you entrance
 Einlaß gewähren.
 ensure-INF
 ‘The key that you will maybe find there will ensure your entrance.’

- (215) Anzunehmen ist, daß eine Frau, die wohl kaum Beratung,
 to.assume-INF is that a woman REL.PRN.ACC maybe hardly advice

¹⁸²DeReKo: R97/JUL.50523 Frankfurter Rundschau, 02.07. 1997.

¹⁸³HAZ07/NOV.05100 Hannoversche Allgemeine, 19.11. 2007.

¹⁸⁴DeReKo: RHZ09/JUL. 20092 Rhein-Zeitung, 23.07. 2009.

sondern Hilfe bei der Polizei sucht, sich akut bedroht fühlt.¹⁸⁵
 but help at the police searches REFL urgently threatened feels
 ‘One would assume that a woman that would obviously hardly look for advice at the police office but rather help feels threatened.’

In analogy to restrictive clauses that contain epistemic modal verbs, the deictic centre is anchored to the speaker.

6.20 Exlcuded from the scope of a quantifier

Inspired by Leech (1971, 73), Drubig (2001, 15) concludes based on data from English that quantifiers are unable to take scope over (‘subjective’) epistemic modal operators. Likewise, Fintel and Iatridou (2003, 174) argue for the existence of the *Epistemic Containment Principle* that prohibits quantifiers to take scope over an epistemic modal operator:

- (216) Epistemic Containment Principle
 A quantifier cannot have scope over an epistemic modal.

Fintel and Iatridou (2003, 174) support their claim with the examples given in (217)–(219). According to their judgements, these examples only allow the *de dicto* reading in which the quantifier is interpreted in the scope of the epistemic modal operator. However, the *de re* reading in which the quantifier takes scope over the epistemic modal operator is blocked and cannot be forced by an appropriate context.

- (217) * Every student may have left but not every one of them has.
 every student x (may x have left) de re, consistent, *ECP
 may (every student have left) de dicto, inconsistent, ^{OK}ECP
- (218) # Every student may be the tallest person in the department.¹⁸⁶
 every student x (may x be the tallest) de re, sensible, *ECP
 may (every student be the tallest) de dicto, nonsense, ^{OK}ECP
- (219) Half of you are healthy. # But everyone may be infected.¹⁸⁷
 every person x (may x be infected) de re, consistent, *ECP
 may (every person be infected) de dicto, inconsistent, ^{OK}ECP

As for example (217), Fintel and Iatridou (2003, 175) discuss a context in which a quantification over an epistemic modal operator would provide the appropriate interpretation. Suppose the speaker is standing in front of an undergraduate residence seeing that some of the lights are on. Thus, he knows that not all of the students are out. But as he does not know which student

¹⁸⁵DeReKo: K98/MAI.51110, Kleine Zeitung, 31.05. 1998.

¹⁸⁵The acceptability judgements reflect those found in Fintel and Iatridou (2003, 176).

¹⁸⁶The acceptability judgements reflect those found in Fintel and Iatridou (2003, 176).

¹⁸⁷The acceptability judgements reflect those found in Fintel and Iatridou (2003, 176).

lives in which room, he does not really know the precise identity of the students that are in their rooms. Accordingly, for every particular student it is compatible with the speaker's evidence that he or she has left. But as Fintel and Iatridou (2003, 175) argue, even in such a context the utterance in (217) is not acceptable just for the very reason that quantifiers cannot take scope over epistemic modal operators.

Regarding the analysis elaborated by Fintel and Iatridou (2003), there are two aspects which merit closer attention: firstly, they only take into consideration one specific epistemic modal auxiliary *may*. There is no discussion for the remaining epistemic modal auxiliaries. It should be checked as to which extent items such as *could* or *might* differ with respect to their interaction with quantifiers. Secondly, they almost exclusively focus on strong quantifiers, in particular *every*. As Fintel and Iatridou (2003, 177) assume, the *Epistemic Containment Principle* could also be extended to weak quantifiers such as *two*, but they only provide scarce evidence for this assumption. Moreover, Fintel and Iatridou (2003, 196) adopt an approach in the style of Heim (1982) in which indefinites are not considered as quantifiers but as variables that are bound by a generic operator. Accordingly, the ECP turns out to be more vulnerable than it appears at first glance.

Finally, Fintel and Iatridou (2003, 176 Fn.7) acknowledge themselves in a footnote that *de re* interpretations of the example given above seem to be acceptable for some native speakers of English. Tancredi (2007) demonstrates that strong quantifiers can indeed take scope over the epistemic modal verb *may* whereas they cannot take scope over epistemic adverbials, such as *perhaps*.

- (220) a. (Objectively speaking), Every student may be Jones.
 b. # (As far as I know), Every student is perhaps Jones.
- (221) a. (Objectively speaking), Most students may be Jones.
 b. # (As far as I know), Most students are perhaps Jones.

According to the perspective taken by Tancredi (2007), there are two types of epistemic modal verbs: metaphysical and doxastic ones. They roughly correspond to distinction between 'objective' and 'subjective' epistemic modality introduced by Lyons (1977). As Tancredi (2007) argues, *de re* interpretations such as the ones discussed above are only possible with metaphysical modal verbs, but never with doxastic ones. Rephrased in Lyon's terms, quantifiers can only take scope over 'objective' epistemic modal verbs but not over 'subjective' epistemic modal verbs. Based on this distinction, Tancredi (2007) suggests an analysis that accounts for the contrasts between epistemic modal auxiliaries and epistemic adverbials in (220) and (221), in terms of different categories: as he assumes, an 'objective' epistemic interpretation is only available for modal auxiliaries but never for adverbials. Finally, he concludes that epistemic modal auxiliaries in the scope of a quantifier must always be construed with an 'objective' epistemic interpretation.

Inspired by the approach elaborated by Tancredi (2007), Huitink (2008) draws a similar conclusion based on data from Dutch. As she argues, epistemic uses of *kunnen* can occur in the scope of expression such as *iedere* 'every' and *minsten drie* 'at least three'.

- (222) Iedere student kan vertrokken zijn.¹⁸⁸
 every student may leave-PPP be-INF

6 Twenty one commandments for epistemic modality

‘Every student may have left, but not every student has left.’

- (223) Minsten drie mannen kunnen de vader van mijn kind zijn.¹⁸⁹
at.least three men may the father of my child be-INF
‘At least three men might be the father of my child.’

Much in Tancredi’s spirit, she argues that quantifiers can only take scope over ‘objective’ epistemic modal verbs but never over ‘subjective’. Thus, Huitink (2008) concludes that any epistemic modal verb that occurs in the scope of a quantifier has to be ‘objective’ epistemic. Following Nuyts (2001a,b), she assumes that the essential difference between an ‘objective’ and ‘subjective’ epistemic modality concerns the accessibility of the evidence upon which the epistemic judgement is grounded: Whereas, in the case of ‘objective’ epistemic modal verbs, the evidence is always accessible to a bigger group of people, it is accessible to the speaker only in the case of ‘subjective’ epistemic modal verbs and inscrutable by other participants. As Huitink (2008) concludes, being based on public evidence, it makes it easier for ‘objective’ epistemic modal verbs to take narrow scope with respect to a quantifier. So it is expected that the evidence is accessible to a bigger bunch of people whenever an epistemic modal verb occurs in the scope of a quantifier.

Summing up, there are a couple of cases in which expressions such as *every* in English, *iedere* and *minsten drie Mannen* take scope over some sort of epistemic modal verb. These examples are not accounted for by Fintel and Iatridou (2003).

There are several ways to explain these configurations. Firstly, one could follow Tancredi (2007) and Huitink (2008) in assuming that any epistemic modal verbs which occurs in such a distribution has to be interpreted in an ‘objective’ epistemic manner. Secondly, one could assume that these configurations become possible due to the interplay of some idiosyncratic properties of the respective epistemic modal verb and the quantifier under consideration. Thirdly, one could assume that the subject NPs considered here are no genuine quantifiers but some other type of NP, for instance, free choice items.

In the remainder of this section, it will be shown that an approach that considers epistemic modal verbs in the scope of NPs like *iedere* and *minsten drie Mannen* as instances of ‘objective’ epistemic modifiers faces insurmountable challenges. Moreover, it will turn out that the alternative explanations seem to cope with these configurations in a more successful way. The analyses elaborated by Tancredi (2007) and Huitink (2008) are problematic for at least four reasons that will be discussed in more detail below: (i) only particular epistemic possibility modal verbs can occur in the scope of a quantifier, (ii) the underlying concept of ‘public evidence’ is fallacious, (iii) ‘subjective’ epistemic modal verbs can occur in the scope of another logical operator (negation), (iv) quantifiers can take scope over other intensional verbs such as *seem* as well.

Firstly, they only take into account a small range of modal verbs and suggest that the discussed phenomena can be extended to the remaining modal verbs as well. Tancredi (2007) only discusses cases with *may* for English; Huitink (2008) almost exclusively focusses on instances of *kunnen* in Dutch. However, it remains to be demonstrated that this phenomenon affects the other verbs which are traditionally considered as ‘objective’ epistemic modal verbs, as well. In

¹⁸⁸ As cited in Huitink (2008, Sect. 1.2). The translation reflects those given by Huitink.

¹⁸⁹ As cited in Huitink (2008, Sect. 1.2). The translation reflects those given by Huitink.

a similar fashion, both of them give most of their attention to the expressions *every* and *iedere*.

In order to find out to which extent this phenomenon applies to all modal verbs that are usually regarded as ‘objective’, the following section provides extensive corpus data from German. All potential candidates among the group of modal verbs will be considered. Being closely related to Dutch, German is expected to behave in a similar way. As it turns out, configurations in which the quantifier *jeder* ‘every’ takes scope over an epistemic modal verb are attested with indicative *können* (224)–(225) and its past subjunctive *könnte* (226)–(228).

- (224) Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
as the school the whole day and partially also at later evening accessible
ist, kann jeder die Kopien mitgenommen haben.¹⁹⁰
is can everybody the copies with.take-PPP have-INF
‘As the school is open during the whole day and sometimes until late in the evening, anyone
could have taken the copies.’
- (225) Auch wenn ein Landstreicher schnell von den Dorfbewohnern verdächtigt
even if a vagabond fast by the villagers suspect-PPP
wird, kann es jeder gewesen sein.¹⁹¹
PASS.AUX can it everybody be-PPP be-INF
‘Even if a vagabond is quickly suspected by the villagers, it could have been anyone.’
- (226) „Diesen Brief könnte jeder geschrieben haben, es geht in keine politische
this letter could everybody write-PPP have-INF it goes in no political
Richtung“, so Werner Hosiner-Gradwohl.¹⁹²
direction so Werner Hosiner-Gradwohl
‘ “Anyone could have written this letter, it does not indicate any political direction.”, ac-
cording to Werner Hosiner-Gradwohl.’
- (227) Und sie nennt andere Wege, wie die Kippe an den Tatort gelangt sein
and she states other ways how the butt at the site.of.crime get-PPP be-INF
könnte. [...] Jeder Passant könnte sie an seinen Schuhen in der Keller getragen
could every pedestrian could she at his shoes in the cellar carry-
haben.¹⁹³
have-INF
‘And she specifies other ways as to how the cigarette butt could have come to the site of
crime. Any pedestrian could have had it on his shoes and carried it into the cellar.’
- (228) Im Prinzip könnte es freilich jeder gewesen sein, der
in principle could it certainly everybody be-PPP be-INF REL.PRN
vorbeigefahren ist.¹⁹⁴
pass-PPP is

¹⁹⁰DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05.06. 1998.

¹⁹¹DeReKo: RHZ09/NOV.16738 Rhein-Zeitung, 19.11. 2009.

¹⁹²DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26.09. 2007.

¹⁹³DeReKo: HAZ08/DEZ.01566 Hannoversche Allgemeine, 09.12. 2008.

‘Certainly, in principle, it could have been anybody who passed.’

Crucially, all the cases involve ‘subjective’ epistemic reasoning. In each example, some unknown person has committed a crime and the speaker does not know who did it exactly. By employing a quantifying subject NP, the speaker makes a restriction on the set of potential suspects. As for example (226), the appropriate paraphrase would be: For every single person, it is consistent with my knowledge that he or she wrote the threatening letter. It is not evident as to which extent the quantifier establishes a set of potential suspects that is exhaustive. In example (228), the speaker suspects the culprit to be among the people who have passed. But this does not necessarily mean that the speaker explicitly excludes that the culprit is not amongst this set.

Note that these observations also hold for the examples with weak quantifiers such as *mindestens drei* ‘at least three’. The German examples can be transferred word by word from the Dutch examples provided by Huitink (2008). As it seems, there are two ways to adapt these examples to German, either with the indicative form *können* (229) or subjunctive of the past form *könnte* (230).

(229) Mindestens drei Männer können der Vater meines Kindes sein.
 at.least three men can the father of my child be-INF
 ‘At least three men could be the father of my child.’

(230) Mindestens drei Männer könnten der Vater meines Kindes sein.
 at.least three men could the father of my child be-INF
 ‘At least three men could be the father of my child.’

As it turns out they fulfil the most important criterion for ‘subjective’ epistemic modifiers is that the embedded prediction is not part of the speaker’s knowledge.¹⁹⁵ Once again, the *mindestens drei* establishes a set of potential suspects.

There are two more epistemic modal verbs in German that resemble *können* and *könnte* in semantic respects: Bech (1949, 20, 22, 38) provides a semantic definition for *dürfte* and *mögen* that amounts to an analysis of these verbs as possibility modal operators, even though he does not use this term. Instead, he calls them “passive” modal verbs. But his definition corresponds to the definition of possibility in modal logic. Likewise, Welke (1965, 110) argues epistemic *mögen* resembles much epistemic *können* in that they can mutually be replaced and in that the both can be substituted by epistemic adverbs such as *möglicherweise*. In a similar fashion, Lötscher (1991, 353) states that *dürfte* can be replaced by *könnte* without any significant semantic effect.

However, they are not attested in the scope of *jeder* and similar expressions. Furthermore, it turns out that neither of the two verbs can replace *können* or *könnte* in the examples above. Whenever epistemic *dürfte* or *mögen* are inserted in these patterns, the quantifier always takes

¹⁹⁴DeReKo: BVZ07/AUG.01787 Burgenländische Volkszeitung, 22.08. 2007.

¹⁹⁵These examples are indeed somewhat tricky. According to the CoDeC the embedded proposition should not be part of the speaker’s knowledge. In the examples above, the embedded proposition is not *Three men are the father of my child*, rather it contains an unbound variable x_i *is the father of my child*. Of course the speaker will know that there is some x which is the father of her child. Accordingly, the proposition x *is the father of my child* will also be part of her knowledge. As it seems then, the CoDeC has to be refined. Maybe, the crucial difference is that in the one case the variable is bound by a quantifier and in the other case it is a free variable.

narrow scope with respect to the epistemic modal verb resulting in interpretations that reflect absurd situations.

- (231) # Mindestens drei Männer dürften der Vater meines Kindes sein.
 at.least three men may the father of my child be-INF
 Intended reading: ‘Perhaps, at least three men are the father of my child.’
- (232) #? Mindestens drei Männer mögen der Vater meines Kindes sein.
 at.least three men may the father of my child be-INF
 Intended reading: ‘Perhaps, at least three men are the father of my child.’
- (233) # Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
 as the school the whole day and partially also at later evening accessible
 ist, dürfte jeder die Kopien mitgenommen haben.
 is might everybody the copies with.take-PPP have-INF
 Intended reading: ‘As the school is open during the whole day and sometimes until late in
 the evening, everyone has perhaps taken the copies.’
- (234) #? Da die Schule den ganzen Tag und teilweise auch am späteren Abend zugänglich
 as the school the whole day and partially also at later evening accessible
 ist, mag jeder die Kopien mitgenommen haben.
 is may everybody the copies with.take-PPP have-INF
 Intended reading: ‘As the school is open during the whole day and sometimes until late in
 the evening, everyone has perhaps taken the copies.’
- (235) # „Diesen Brief dürfte jeder geschrieben haben, es geht in keine politische
 this letter might everybody write-PPP have-INF it goes in no political
 Richtung”, so Werner Hosiner-Gradwohl.
 direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any political
 direction.”, according to Werner Hosiner-Gradwohl.’
- (236) #? „Diesen Brief mag jeder geschrieben haben, es geht in keine politische
 this letter may everybody write-PPP have-INF it goes in no political
 Richtung”, so Werner Hosiner-Gradwohl.
 direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any political
 direction.”, according to Werner Hosiner-Gradwohl.’

Accordingly, the only interpretation that is available for example (231) would refer to an act of procreation that lies beyond any imagination. A similar reasoning applies for the other examples with epistemic *dürfte*, (233) and (235). In contrast, the examples with epistemic *mögen* are far less clear. This might be related to the fact that its pure possibility reading has vanished from present day spoken Standard German, the typical native speaker of Standard German will not have any active knowledge any more to employ *mögen* in this particular use. Rather, epistemic *mögen* has acquired a concessive component. However, it is beyond doubt that *mögen* cannot be

interpreted in the scope of the quantifying subject NPs such as *jeder* or *mindestens drei*. Thus, a *de dicto* reading is not available in (232), (234) and (236).

Likewise, it is not possible to provide compelling evidence that the remaining two epistemic modal verbs *müssen* and *werden* occur in the scope of a quantifier. Obviously, this is due to the fact that both of them are necessity modals.¹⁹⁶ As it has been pointed out by Fintel and Iatridou (2003, 175, 177), scope ambiguities cannot be detected as long as the epistemic modal and the subject NP involve universal quantification. Thus, *de dicto* interpretations and *de re* interpretations become indistinguishable in such situations.

Summing up this counter-argument, it has been demonstrated that there are only two particular epistemic items that are attested in the scope of an expression like *jeder* or *mindestens drei* the possibility verbs; *können* and *könnte*. The situation for (British) English seems to be similar. As Philippa Cook has pointed out (pers. commun), the most appropriate translation for the example discussed by Huitink (2008) would involve *could*, cf (237). The other possibility modal verbs *may* and *might* appear to be awkward in this environment.

(237) At least three men could be the father of my child.¹⁹⁷

What conclusion does this invite? Defending the claim that quantifiers can only take scope over ‘objective’ modal verbs but never over ‘subjective’ ones, one could argue that these two items are the only true ‘objective’ epistemic verbs in German. Indeed, Öhlschläger (1989, 207) assumes that *mögen* does not involve an ‘objective’ epistemic interpretation, examples like (232), (234) and (236) are expected to lack a *de dicto*-interpretation. However, as Öhlschläger (1989, 192) argues, the class of ‘objective’ epistemic modal verbs in German does not only comprise *können*, but also *müssen* and *dürfte*. As it has been shown above, these two verbs cannot occur in the scope of *jeder* and *mindestens drei* in German. One could reason that Öhlschläger (1989) is wrong and German only has two truly ‘objective’ epistemic modal verbs; *können* and *könnte*. Alternatively one could assume that the class of ‘objective’ epistemic modal verbs in German also encompasses *müssen* and *dürfte* and that these items cannot occur in the scope of a quantifier due to further, idiosyncratic restrictions. As the first solution seems to be somewhat counter-intuitive, there is no way to avoid the assumption that the contrast discussed here is mainly driven by idiosyncratic properties of the verb. Thus, it is not necessary to assume a separate category like ‘objective’ epistemic modality in order to account for epistemic modal verbs that occur in the scope of an expression like *jeder* or *mindestens drei*.

Apart from this, Huitink’s approach faces a second problem. Her analysis is based on the assumption elaborated by Nuyts (2001a,b) that the accessibility of the evidence is the crucial factor in the distinction between ‘objective’ and ‘subjective’ epistemic modality. Whereas the evidence upon which the epistemic evaluation is based is accessible to a bigger group of people in the case of ‘objective’ epistemic modal verbs, it is accessible to the speaker only and inscrutable from the outside in the case of ‘subjective’ epistemic examples. However, this analysis makes the wrong prediction for her example (223), which is repeated here as (238). Following Huitink (2008), the quantifying NP *minsten drie* can take scope over the epistemic *kunnen* because it is an ‘objective’ epistemic modal verb.

¹⁹⁶Brennan (1993, 97) and Enç (1996, 356) analyse the English future auxiliary *will* as necessity modal. As it seems this analysis can be extended to German *werden* as well. A detailed discussion is given in Section 4.2.10.

¹⁹⁷This example has been provided by Philippa Cook.

- (238) Minsten drie mannen kunnen de vader van mijn kind zijn.¹⁹⁸
 at.least three men may the father of my child be-INF
 ‘At least three men might be the father of my child.’

Accordingly, this instance of *kunnen* should involve an epistemic evaluation that is based on ‘public evidence’: everyone should come to the same conclusion that at least three men could be the father of the child. But utterances like (238) are most usually uttered in contexts in which the speaker alone knows the exact number of men with whom she was romantically involved. Furthermore, this sentence is perfectly felicitous if the speaker herself only has the appropriate evidence to draw this conclusion. An approach as the one advocated by Huitink (2008) would at least expect that example (238) should exhibit different degrees of acceptability depending on which extent the evidence is accessible. However, as it seems, the utterance is equally perfectly acceptable irrespective of whether the evidence is accessible to the speaker only or to a bigger group. Correspondingly, the accessibility of the evidence on which the epistemic judgement is based is completely irrelevant for the acceptability of (238).

Yet, there is another problem for an approach in the style of Tancredi (2007) and Huitink (2008). As it has been demonstrated in Section 6.10, there are a couple of ‘subjective’ epistemic modal verbs that are attested in the scope of negation which is also a logic operator. Once again, it is in particular epistemic *können* that occurs in the scope of a negation. This reflects by and large the scope interaction with quantifiers. Thus, it does not seem to be very odd for epistemic operators to occur in the scope of logic operators.

Finally, the approaches by Tancredi (2007) and Huitink (2008) face another challenge. As it has been observed at various occasions, intensional/evidential raising verbs such as *appear* or *seem* can occur in the scope of all sorts of quantifiers: (239) is taken from Moulton (2010) who has been inspired by Williams (1983, 293), (240) is taken from Richter and Sailer (2008) and (241)–(242) are taken from Lechner (2006, 49):

- (239) A student seems to be sick today.
- (240) A student seems to have passed the test.
- (241) a. Every critic seemed to like the movie. de re/*de dicto
 b. It seemed that every critic liked the movie. de dicto
- (242) a. A critic seemed to like the movie. de re/de dicto
 b. It seemed that a critic liked the movie. de dicto

As Lechner (2006, 49) stresses, strong quantifiers with intensional raising verbs are restricted to a *de dicto* interpretation. This is somewhat unexpected under the perspective taken by Tancredi (2007). As it has been demonstrated by Bartsch (1972, 28), Clément and Thümmel (1975, 51, 56, 61, 65, 68, 73), Cinque (1999, 130) and Mortelmans et al. (2009, 43), evidential operators can take scope over epistemic modal operators but not the other way round. As a quantifier typically takes scope over an evidential operator and as an evidential operator typically takes scope over an epistemic modal operator, it should follow that, in principle, it should be possible that

¹⁹⁸As cited in Huitink (2008).

a quantifier can also take scope over an epistemic operator. This is in conflict with Tancredi's assumption. Finally, it remains a great mystery for any account based on the *Epistemic Containment Principle* as to why universal quantifiers can bear scope over intensional raising verbs such as *seem* in the first place and as to why even this scope interpretation is the preferred one.

Summing up, it has been shown that the assumption of a separate category 'objective' epistemic modality is not necessary to account for the acceptability of epistemic modal verbs which occur in the scope of quantifying expressions such as *jeder* or *mindestens drei*. Rather, this style of approach makes a couple of false predictions. Furthermore, what Tancredi (2007) has demonstrated is not so much that quantifiers cannot take scope over 'subjective' epistemic modal verbs, but rather that quantifiers fail to take scope over epistemic adverbs, such as *perhaps*. As it will be shown, it is not necessary to assume a separate category 'objective' epistemic modality to account for this contrast.

Refuting the analyses elaborated by Tancredi (2007) and Huitink (2008), it becomes necessary to provide an alternative approach. Any successful account has to provide answers for three essential questions: (i) Why are there restrictions on quantifiers over epistemic modal verbs in the first place? (ii) Which epistemic modal verbs are exempt from this restriction? (iii) How can the contrast between epistemic modal verbs and epistemic adverbs be accounted for?

In the remainder of this section, two approaches will be outlined that are in large part compatible with each other. Firstly, one could assume that the restrictions on quantifiers over epistemic modal verbs are due to an interplay of idiosyncratic properties of the respective epistemic modal verb and the quantifier. As it has been illustrated above, all the examples discussed so far have involved possibility modal verbs which are existential quantifiers over possible worlds: English *may*, Dutch *kunnen* and German *können* and *könnte*. This could indicate that quantifying NPs only take scope over possibility modal verbs. But then the question arises as to why in German *jeder* and *mindestens drei* fail to take scope over epistemic *dürfte* and epistemic *mögen* which are traditionally considered as possibility verbs as well, as it has been suggested by Bech (1949, 20, 22, 38). However, this classification is contested by a whole range of authors. As it has been illustrated by Kratzer (1981, 58), epistemic *dürfte* is difficult to translate into English, there is no direct corresponding verb in English, she provides a rough circumscription: *it is probable that*. Later, in Kratzer (1991, 650), she becomes more explicit, considering *dürfte* as a weak necessity modal. In a similar fashion, Öhlschläger (1989, 195, 258) does not regard epistemic *dürfte* as an indicator of possibility but rather as an indicator of probability. An extensive discussion is given in Section 4.2.5. Likewise, *mögen* does not fulfil the requirements of a well behaved possibility modal verb either. As it has been shown by Bech (1949, 23), Welke (1965, 110), Allard (1975, 88), Öhlschläger (1989, 187 Fn. 121), Fritz (1991, 48) and Diewald (1999, 236) epistemic *mögen* usually conveys some concessive meaning and thus behaves in a marked manner. A detailed discussion on this issue can be found in Section 4.2.7. As it turns out, quantifying expressions such as *jeder* and *mindestens drei* can only take scope over the true epistemic possibility modal verbs *können* and *könnte* in German. The data from English provided by Tancredi (2007) and the data from Dutch provided by Huitink (2008) additionally supports this assumption.

Turning back to question (ii), it has been shown that expressions like *jeder* and *mindestens drei* with scope over an epistemic operator are only attested in configurations in which the epistemic modal verb is a possibility verb. This could lead us to the conclusion that the modal force is the relevant aspect. In the case of possibility modal operators, existential quantification is involved

which is canonically regarded as weak quantification.

In turn, this insight could finally provide an answer to question (i): As it has been pointed out by Lechner (2006, 49), weak quantifiers underlie less restrictions, they occur more readily in marked distributions than strong quantifiers do: Whereas, for instance, weak quantifiers in the subject position of a raising verb can reconstruct into a scope position below the raising verb, strong quantifiers fail to reconstruct. As a consequence, it is plausible to assume that the acceptability of an epistemic operator in the scope of a quantifier is the result of the interplay between the strength of the quantifier and the modal force of the epistemic operator. In a similar manner, Lyons (1977, 801) has already pointed out that epistemic possibility verbs appear to be much more flexible as compared to their counterparts which encode a necessity.

Turning to the contrasts between epistemic possibility verbs and epistemic possibility adverbs such as *perhaps*, it seems to be necessary that the subject quantifier is in an agreement relation with the epistemic operator. This would explain why a quantifier never takes scope over an epistemic adverbial. This reasoning is supported by the fact that the plural subject *most students* in (221a) repeated here as (243a) matches with a singular NP in predicative *Jones* mediated by the finite verb.

- (243) a. (Objectively speaking), Most students may be Jones.
 b. # (As far as I know), Most students are perhaps Jones.

However, it is doubtful to which extent all of the examples discussed here do indeed involve genuine quantifiers. Attentive readers might have noticed that, in the German examples (224)–(228), *jeder* was consequently translated as *anybody* rather than *everybody*. Accordingly, the suspicion arises that the instances of *jeder* in the examples above turn out to be universal free choice items, rather than universal quantifiers. This suspicion is supported by the fact that, in any context in which in English *any* is chosen, it would be translated as *jeder* in German. Thus, *jeder* is ambiguous between an interpretation as a genuine universal quantifier and an interpretation as a universal free choice item. As a consequence, it is possible to elaborate an alternative approach in which the quantifying expressions under discussion such as *jeder* are treated as free choice items.

Such an approach is further supported by the observation made by Menedéz-Benito (2010, 33) who illustrates that it is the typical property of universal free choice items to take scope over possibility modal verbs. Moreover, she shows that universal free choice items are rather reluctant to bear scope over necessity modals. Note that Menedéz-Benito (2010) focusses exclusively on universal free choice items which bear scope over circumstantial possibility verbs. However, as it appears, this phenomenon seems to be possible with epistemic possibility verbs as well. In her analysis, Menedéz-Benito (2010, 41) regards universal free choice items as indeterminate pronouns that have to agree with a universal quantifier. This universal quantifier is a propositional operator $[\forall](A)$ operating on the set of propositions A. This set is constituted by the individual alternatives that indeterminate pronouns usually denote: *you can pick any card* $A = \{ \text{you can pick The Queen, you can pick The Ace, you can pick The Ace and The Queen, ...} \}$. The manner as to how epistemic modal verbs and universal free choice items would interact appears to be a highly complex phenomenon that most certainly cannot be investigated in much details here.

There is another fact which makes this second approach that is based on universal free choice items more plausible. As Menedéz-Benito (2010, 62) observes, universal free choice items are not licensed by the epistemic possibility adverbs *perhaps*. Assuming that the examples in which *jeder*, *iedere* and *every* take scope over an epistemic modal verb involve universal free choice items rather than universal quantifiers. Then, one would expect that these expressions should never bear scope over an epistemic adverb. This corresponds of the contrast between epistemic modal verbs and epistemic adverbs observed by Tancredi (2007). As it has been suggested above, an alternative explanation to Tancredi's proposal can be achieved based on the assumption that quantifying expressions can only take scope over epistemic operators if they establish an agreement relation with each other. This assumption is supported for West Germanic languages at least.

However, under the perspective developed here, two challenges arise. Firstly, the analysis based on universal free choice items would imply that *every* in Tancredi's examples would have to be analysed as a free choice item rather than as a universal quantifier. This is indeed a rather unusual conclusion. But as the acceptability of these examples are contested by Fintel and Iatridou (2003, 176 Fn.7), it seems to be plausible to assume that the use of *every* as a universal free choice item, is restricted to some subset of the native speakers of English. According to this view, this subset of speakers would have a lexicon where *every* has an additional free choice item interpretation next to its canonical quantifier interpretation, much in the way as the lexicon of native speakers of Dutch or German are structured. Secondly, the analysis sketched here implies that other quantifiers such as *at least three*, *minsten drie*, *mindestens drei* should also exhibit an interpretation as a free choice item. This issue yet remains to be thoroughly investigated.

Summing up, it has been shown in this section that *Epistemic Containment Principle* advocated by Fintel and Iatridou (2003) is contested, as there is a restricted set of epistemic modal verbs that can occur in the scope of expressions like *every*, *jeder*, *minsten drie*. Crucially, these instances cannot be taken as a justification of the existence of 'objective' epistemic modal verbs. Firstly, these configurations are only attested with a small subset of epistemic possibility modal verbs. If it was a characteristic for an 'objective' epistemic modal verb to be able to occur in the scope of *jeder*, it remains unclear as to why the remaining verbs which are generally regarded as 'objective' epistemic fail to occur in this distribution. Furthermore, the quantifying subject NPs in the examples given above exhibit striking similarities with universal free choice items. Thus, it is likely that the NPs discussed here are indeed free choice items.

If the analysis based on free choice items is on the right track, the *Epistemic Containment Principle* could possibly be maintained, as the items that take scope over the epistemic modal verbs in the attested examples would no longer be regarded as canonical quantifiers. Yet, it has to be demonstrated (i) that universal quantifiers involve a manner of quantification that substantially differs from those quantifiers which are binding universal free choice items and (ii) that the *Epistemic Containment Principle* does not falsely exclude this second type of quantification. Even if such an approach should succeed, it remains mysterious as to why quantifiers should not be able to take wide scope over epistemic modal verbs, whereas they are able to take scope over intensional/evidential raising verbs such as *seem*. Thus, the *Epistemic Containment Principle* cannot be taken for granted unless it is demonstrated that it can account for these two challenges. Furthermore, it does not serve to justify the existence of an 'objective' epistemic modality. The number of epistemic modal verbs that seem to circumvent the *Epistemic Containment Principle*

is fairly restricted: as for German, only two items are attested *können* and *könnte*. If it was the property of the class of ‘objective’ epistemic modal verbs to circumvent this principle, it is far from clear as to why not all members of this class are attested in the scope of expressions like *jeder* or *mindestens drei*.

6.21 No assent/dissent

Lyons (1977, 799) argues that only ‘objective’ epistemic modal verbs are statements about facts. Moreover, he concludes that what the speaker states to be the case can be denied, questioned and accepted as a fact by the addressee. Correspondingly, the addressee could refer to these statements with expressions of agreement or disagreement, such as *I agree* or *that’s not true*. Since he considers ‘subjective’ epistemic modal verbs as statements of opinions, he concluded that they cannot be denied, questioned or accepted. In a similar vein, Öhlschläger (1989, 210) suggests that only ‘objective’ epistemic modal verbs can be commented on. Based on his assumption that the only unambiguous ‘subjective’ epistemic modal verb is *mag*, he concludes that the discourse anaphora *das* in (244b) can only refer to the proposition in the scope of the epistemic modal operator *the accused is the culprit* but not to the attitude encoded by the ‘subjective’ epistemic modal operator *mag*:

- (244) a. A: Der Angeklagte mag der Täter sein.
 the accused may the culprit be-BE
 b. B: Das glaube ich nicht.¹⁹⁹
 that believe I NEG
 ‘A: The accused may be the culprit.’
 ‘B: I don’t think so.’

In contrast, he assumes that the discourse anaphora *das* can refer to *können*, *müssen* and *dürfte* if they are used in an ‘objective’ epistemic manner.

As it has been shown in various examples in this study, the restricted acceptability of *mag* is in most cases rather due to its very specific concessive meaning. Moreover, it is not so clear as to whether *das* could really establish a reference to the epistemic modal verb if *mag* (244a) was replaced by *kann*, *muss* or *dürfte*. As it seems, they are not that much more acceptable than *mag* in this configuration. Correspondingly, it is doubtful whether the judgements advocated by Öhlschläger reflect the actual language use.

As Papafragou (2006, 1697) has pointed out, the assent/dissent test is not a diagnostic that serves for a reliable distinction between an ‘objective’ and a ‘subjective’ epistemic interpretation. First of all, she confirms that discourse anaphora cannot refer to mental acts that are encoded by epistemic modal verbs. But as she further demonstrates, acts of inference are generally difficult to challenge by another referent. In the example given above, addressee B would need secure and complete access to the speaker’s knowledge in order to verify whether the conclusion has been made in a correct manner. Papafragou (2006, 1698) shows that this does not only concern ‘subjective’ epistemic modal operators, but also other predicates and expressions

¹⁹⁹As cited in Öhlschläger (1989, 210).

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that encode a mental acts and inferences, such as *infer*, *conclude* and *it follows from what I currently know that*. As she demonstrates, the incompatibility of epistemic modal verbs with the assent/dissent test is due to the external inscrutability of mental acts which concerns all predicates that refer to a mental act of conclusion.

To some extent, dissent is possible with epistemic modal verbs. In particular, this concerns contexts in which it is the speaker himself who challenges the validity of the conclusion. In the examples adduced by Papafragou (2006, 1698), the subject of the dissent is the modal force:

- (245) Clark Kent may be Superman. No that's not right: Clark Kent must be Superman.
(246) Clark Kent must be Superman; no wait, that's not right. Superman may be Clark Kent.

Similar examples are discussed by Stephenson (2007, 492). In example (247c), Sue expresses her disagreement with Sam's epistemic reasoning by using a negated epistemic possibility verb:

- (247) a. Maria: Where's Bill?
b. Sam: I'm not sure. He might be in his office.
c. Sue: No, he can't be. He never works on Fridays

As it has been already shown in Section 6.9, the modal force of an epistemic modal operator can be also challenged by a dialogue partner.

To sum up, the assent/dissent test is not a diagnostic that is appropriate to distinguish 'subjective' epistemic modal verbs from 'objective' epistemic modal verbs. Assent or dissent with epistemic modal verbs is highly restricted and only possible in particular environments.

6.22 Objective and subjective epistemic modality – a reassessment

As it has been pointed out in the preceding section, the assumption that epistemic modality has to be divided into a separate 'objective' and a 'subjective' epistemic sub-category causes lots of unwelcome difficulties. At the outset of this section, the motivation that lead Lyons (1977, 799) to the postulation of this distinction will be carefully re-visited. As it turns out, Lyon's proposal is not systematically elaborated on, as it is almost exclusively based on observations of one particular epistemic modal operator: the auxiliary *may*. Moreover, it involves conflicting assumptions: on the one hand he assumes that 'objective' modal operators are less complex than their 'subjective' counterparts in that they take a narrower scope than the latter type. On the other hand, he argues that 'objective' epistemic modal operators are more complex in that they are derived from their 'subjective' epistemic cognates.

Furthermore, it will be demonstrated that any later approach which adopts the distinction into an 'objective' and a 'subjective' epistemic modality either departs drastically from Lyon's basic assumptions or is even not aware of their conflicting character. Finally, it will turn out that any of these approaches characterises 'objective' epistemic modality in terms of properties that do not yield a consistent class. Apart from this, most of these accounts involve additional assumptions that turn out to be problematic.

6.22.1 Lyon's original motivation

Based on work by the philosopher R.M Hare, Lyons (1977, 749, 802) assumes that each utterance consists of three components: a phrastic component that corresponds to the propositional content of the utterance, a tropic component that specifies the kind of speech act and finally a neustic component that indicates the speaker's commitment to that speech act. Accordingly, each of these components can be individually negated. The phrastic negation results in a context free assertion of a negative proposition: *I say that is the case that not-p*. The tropic negation yields a denial: *I say that it is not the case that p*. The neustic negation corresponds to a non-commitment *I don't say that it is the case that p*. In his formalisation, Lyons (1977, 802) represents the phrastic component by the variable *p*, the tropic and the neustic component each by a full-stop. By means of different combinations of various operators, a whole range of utterance types can be captured such as assertion (248), question (249), command (250), prohibition (251) and deliberative question (252):

- (248) ..p
- (249) ?.p
- (250) .!p
- (251) .~!p
- (252) ?!p

According to Lyons (1977, 804), the modal operators *poss* and *nec* can occupy either position. In the case in which the speaker wants to express that he knows about the possibility that *p*, he chooses an 'objective' epistemic operator yielding: *I say so that it is possibly the case that p*. If he is not so committed to his assertion, he would rather use a 'subjective' epistemic operator: *Possibly/Perhaps it is the case that p*. In order to illustrate the nature of 'objective' epistemic modality, Lyons (1977, 798) provides the following example. Imagine that Alfred is part of a community of 90 people. Assume that the speaker knows that 30 of them are unmarried without being aware as to who exactly they are. Employing *may* in this context, the speaker signals his knowledge of the possibility that Alfred is unmarried, as it is shown in (253). Assume that the speaker could already identify 89 people, among them 29 who are unmarried and that only Alfred is left. Given this sort of context, the speaker uses *must* to indicate that he knows about the necessity that Alfred is married, as illustrated in (254).

- (253) Alfred may be unmarried
- (254) Alfred must be married

Following this claim, a speaker can chose, depending on the knowledge, between operators that express an 'objective' epistemic modality and operators that express a 'subjective' epistemic modality. Correspondingly, Lyons (1977, 804) argues that objective epistemicity is a qualifier for the tropic *it is so* component (255) and that subjective epistemicity is a qualifier for the neustic *I-say-so* component (256).

- (255) .poss p

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(256) poss.p

Lyons (1977, 799) assumes that utterances that contain ‘objective’ modal operators do not differ from canonical assertions:

The speaker is committed to their factuality of the information he is giving to the addressee: he is performing an act of telling

Furthermore, Lyons (1977, 799) argues that ‘objective’ modal verbs are stated and, thus, they can be embedded by a whole range of operators, such as question operators:

What he states to be the case can be denied, questioned, accepted as a fact by the addressee, it can be hypothesised in a real conditional statement, it can be referred to by the complement of a factive predicator.

In contrast, Lyons (1977, 805) considers ‘subjective’ epistemic modal operators as proper illocutionary force.

[The function of subjective epistemic modality] is to express different degrees of commitment to factuality; and in this respect it qualifies the illocutionary act in much the same way that a performative verb parenthetically qualifies, or modulates, the utterance of which it is a constituent in an explicitly performative utterance or a primary performative with a performative clause tagged on to it. Looked at from this point of view, *It may be raining* (construed as a subjectively modalised utterance) stands in the same relationship to *It's raining*, *I think* or *I think it's raining* as *Is it raining?* does to *Is it raining*, *I wonder?* or *I wonder whether it's raining*.

Lyons (1977, 808) argues that, from this organisation, it follows that there can only be one ‘subjective’ epistemic operator in each utterance.

Apart from that, he provides a couple of further characterisations of these two types of epistemic modality. First of all, Lyons (1977, 797 ff.) points out that there is no clearcut distinction between ‘objective’ ‘subjective’ epistemicity:

This is not a distinction that can be drawn sharply in everyday use of language; and its epistemological justification is, to say the least, uncertain. It is also difficult to draw a sharp distinction between what we are calling objective modality and alethic modality.

[...]

Granted that the distinction between subjective and objective epistemic modality is theoretically defensible (and we have already pointed out that objective epistemic modality, if it is a viable notion, lies between alethic modality, on the one hand, and subjective modality, on the other, and might be assimilated to either), the question now arises how we should account for these distinction in terms of the tripartite analysis of utterances developed in the previous chapter.

However, it is not clear how this fuzzy transition between ‘objective’ and ‘subjective’ epistemic modality could be accounted for by the formalisation suggested by Lyons (1977, 804), which is based on two distinct positions for the two different modalities.

Furthermore, Lyons (1977, 801) concludes that some modal operators are more basic than others. In the case of English, he argues that epistemic possibility is more basic than epistemic necessity and that epistemic possibility should be considered as a primitive of modality. Moreover, Lyons (1977, 805) assumes that ‘subjective’ modality is more basic than ‘objective modality’. As Lyons (1977, 806) argues ‘objective’ epistemic modality is derived from its ‘subjective’ counterpart by a process of ‘objectification’. As a consequence, he predicts that ‘objective’ epistemic operators should only occur in languages if there is an appropriate established ‘subjective’ cognate from which it could be derived. However, from a diachronic perspective these claims are not plausible at all. As Fritz (1997, 140) and Diewald (1999, 273, 366) have demonstrated, the historical development is rather the other way around: at first, readings of *können* and *müssen* came into existence in which they denote a practical possibility or necessity. These readings were the base for the grammaticalisation of speaker related epistemic possibility and necessity interpretations.

Finally, Lyons (1977) observes tendencies that some syntactic categories appear to have preferences as to which type of modality they would encode. Yet, he does not become very explicit in this matter. Lyons (1977, 798) argues that *perhaps* is not appropriate to express ‘objective’ epistemic modality. As Lyons (1977, 806) further concludes, “it is much more natural to use modal verbs for ‘subjective’, than for the expression of ‘objective’ epistemic modality”. In contrast, he states that patterns like *it is possible that, there is a possibility of* are more appropriate for the expression of ‘objective’ epistemic modality.

The account elaborated by Lyons (1977) remains very sketchy in many respects. Therefore, it is not very systematic and faces serious challenges. As he concedes, modal verbs with an ‘objective’ epistemic interpretation are rather exceptional. But is there any reason to believe that they exist at all? An important piece of evidence for Lyon’s hypothesis is example (180) which has already been considered extensively in Section 6.17, here it is repeated as (257):

(257) If it may be raining, you should take your umbrella.

As Lyons (1977, 805) concludes, the modal verb *may* in (257) has to be an ‘objective’ epistemic one, as it occurs in the antecedent of a conditional clause. In Section 5.4.1 and Section 6.17, it has already been pointed out that there are different types of conditional clauses. Lyons’ restriction only makes sense for event related conditionals but not for epistemic and speech act related conditionals. In its most natural interpretation, the antecedent in (257) is echoic, in that it involves a proposition that has been already added to the common ground. As pointed out by Fabricius-Hansen and Sæbø (1983, 8) Haegeman (2002, 121, 126) and Eisenberg (2004, 346), this indicates that the conditional is not an event related one. Haegeman (2002, 119) has illustrated that speech act related conditionals such as the one in (257) have their own illocutionary force. As a consequence, there is nothing that would prevent speaker related operators such as ‘subjective’ epistemic modal verbs from occurring in such contexts.

As will be shown in Section 6.22.5, the majority of cases that have been considered as ‘objective’ epistemic modal verbs do not involve any epistemicity at all. They can be more efficiently be analysed as practical possibility or necessity modal verbs, or as quantificational modal verbs.

Lyons' characterisation of 'objective' epistemic modality is based on conflicting assumptions. On the one hand, he concludes that it is related to 'alethic' modality and that they take a narrower scope than their 'subjective' cognates. On the other hand, he states that 'objective' epistemic modal verbs are derived from a 'process of objectification' from their 'subjective' counterparts.

Furthermore, this 'process of objectification' envisaged by Lyons (1977, 806) is in conflict with the development of epistemic modal verbs. Fritz (1997, 140) and Diewald (1999, 273, 366) have shown that the 'subjective' epistemic modal verbs developed out of the 'objective' practical possibility and necessity readings. Unless a plausible and detailed formulation of this 'process of objectification' is put forth, it is misleading to pursue such an approach.

6.22.2 Further advancements in the study of 'objective' epistemic modality

The treatment of epistemicity put forth by Lyons (1977) became fairly influential in the discussion on modality. These ideas have been adopted by many researchers each of whom departing in a fairly different direction. In particular, there are three questions with respect to which these accounts differ: (i) What is the precise nature of objective epistemic modality? (ii) Which of the two epistemic modalities is underlying? (iii) Do particular categories involve preferences for any of these two epistemic modalities?

Turning to the first question, Lyons (1977, 797) assumes in his original proposal that 'objective' epistemic modality is closely related to pure mathematical logic, to alethic modality. Likewise, Öhlschläger (1989, 192) explicitly refers to expressions of modal logic in his semantic definitions of the 'objective' epistemic uses of modal verbs. However, this type of approach is hardly compatible with the assumption that 'objective' epistemic modality is derived from its 'subjective' cognate.

In contrast, a whole series of approaches such as Diewald (1999, 79) assumes that the crucial aspect of 'objective' epistemic modality is an evidential dimension rather than alethic or logical reasoning. This has been most explicitly stated by Nuyts (2001b, 384, 386) who argues that 'subjective' epistemic modal verbs involve evidence that is accessible to the speaker alone, whereas 'objective' epistemic modality is based on evidence that is accessible to a bigger group of referents. Furthermore, Nuyts (2001b, 393) argues that 'objective' epistemic modality should not be related to alethic reasoning. He is completely aware of the fact that his conception of 'objective' epistemic modality differs in essential details from Lyons' original idea and that it makes different predictions. As a consequence, he suggests to replace the term 'objective' epistemic modality by 'inter-subjective' modality. Furthermore, Nuyts (2001b, 393) concludes that 'subjective' and 'inter-subjective' epistemic modal operators do not essentially differ with respect to the distribution in which they can occur, and that differences of their behavioural properties can be derived from functional aspects. Papafragou (2006, 1694), Tancredi (2007, 2) and Huitink (2008, 7) follow the spirit of these assumptions in that the distinction between 'subjective' and 'objective' epistemic modality is based on whether the underlying evidence is accessible to the speaker alone or public evidence. In a similar fashion, Cohen (2010) assumes that 'objective' and 'subjective' epistemic modal operators are both modifiers of the speech act and only differ with respect to the accessibility of the underlying evidence.

As it turns out, the exact nature of the distinction between 'objective' and 'subjective' epis-

temic modality is far from obvious. First of all, Lyons (1977) remains rather vague in his original definition. Subsequent adaptations of his proposal lead to fairly different implementations of the concept ‘objective’ epistemic modality.

The second question addresses the issue as to which of the both modalities is more basic. Following the original proposal elaborated by Lyons (1977, 806), ‘subjective’ epistemic modality is more basic and its objective counterpart can be derived from it by a process of ‘objectification’. In a similar fashion, the approach outlined by Nuyts (2001b, 393) implies that ‘inter-subjective’ epistemic modal operators are more complex than ‘subjective’ epistemic ones: whereas a speaker using the first type indicates that he assumes or concludes that the modified proposition is true, a speaker that uses the second type additionally expresses that he knows that other referents make the same assumption or conclusion. More specifically, Nuyts (2001b, 392) assumes that ‘subjective’ epistemic patterns can acquire ‘non-subjective’ meaning.

In contrast, Hengeveld (1988, 259), Gamon (1993, 152) and Diewald (1999, 273, 366) have demonstrated that the diachronic development suggests that ‘subjective’ epistemic modal verbs developed out of ‘objective’ ones. Likewise, Watts (1984, 133) has shown that ‘epistemic’ *can* in English can never be interpreted in a ‘subjective’ manner and is restricted to an ‘objective’ epistemic interpretation. This indicates that *can* has never developed a ‘subjective’ epistemic interpretation but it can nevertheless be interpreted in an ‘objective’ epistemic manner. Finally, there are accounts, such as the ones defended by Öhlschläger (1989) and Tancredi (2007), which do not explicitly take a position in this matter. However, both authors stress that ‘objective’ epistemic modal verbs take a narrower scope position than ‘subjective’ epistemic modal verbs. This implies that ‘objective’ epistemic modal verbs would be regarded as more basic as a narrower scope position is canonically associated with less complexity.

The third question concerns the different ways in which to realise the two types of epistemic modality. Again, various claims about preferences have been made that are far from homogeneous. As Lyons (1977, 806) argues, it is much more natural to use modal verbs for the expression of ‘subjective’ than for the expression of ‘objective’ epistemic modality. In much the same spirit, Watts (1984, 138) concludes that modal verbs are almost always restricted to ‘subjective’ epistemic readings:

Unless *may* is combined with one of the two modal adverbs *possibly* and *perhaps*, however, will almost certainly interpreted subjectively.

However, this conflicts with his own observation that *can* only occurs with an ‘objective’ epistemic interpretation but never with a ‘subjective’ one, cf. Watts (1984, 133). In contrast, Nuyts (2001b, 392) concludes that modal verbs are perfectly neutral with respect to the two types of epistemic modality. But as it has been indicated above, his assumptions are based on the concept of ‘inter-subjective’ epistemic modality, rather than ‘objective’ epistemic modality. Finally, Perkins (1983, 101) argues that *possibly* is always interpreted in an ‘objective’ epistemic way, whereas *perhaps* and *maybe* can be either interpreted in an ‘objective’ or ‘subjective’ epistemic way.

As for epistemic adverbials, Lyons (1977, 798) remarks that *perhaps* cannot be interpreted in an ‘objective’ manner in the example he provides. In a similar vein, Watts (1984, 138) argues that the epistemic adverbs *possibly* and *probably* are restricted to a subjective interpretation.

Based on data from Hungarian, Kiefer (1984, 69) concludes that epistemic adverbs must always be ‘subjective’. Similar claims for German have been made by Öhlschläger (1989, 212) and Diewald (1999, 84). Finally, Tancredi (2007, Sect. 1 and Sect. 10) assumes that the epistemic adverbs *perhaps* and *probably* in English strongly prefer a subjective use.

In opposition, Nuyts (2001a, 389) discusses examples of the epistemic adverbs *waarschijnlijk* and *wahrscheinlich* ‘probably’ in Dutch and German in which they report results of a long term research. Thus, he concludes that these instances have to be construed with an ‘inter-subjective’ interpretation. Moreover, he considers most occurrences found in his corpus study “perfectly neutral” and compatible with both a ‘subjective’ and an ‘inter-subjective’ interpretation.

Turning to epistemic adjectives, Lyons (1977, 806) assumes that patterns like *it is possible that, there is a possibility that* are more appropriate to express an ‘objective’ epistemic modality than the modal verb *may*. More radically, Perkins (1983, 67) concludes that all epistemic expressions in predicative copula constructions are restricted to an ‘objective’ epistemic interpretation. This view is, by and large, supported by Nuyts (2001b, 389) who argues that ‘subjective’ uses of epistemic adjectives are possible, in principle, but they are very rare.

Finally, Perkins (1983, 101) suggests that there are more factors that govern the realisation of epistemic modality. Apart from the respective category, the lexical semantic of the respective item seems to play a role. As he argues, *possibly, it’s possible* and *there’s a possibility* are inherently ‘objective’ epistemic.

Summing up, among the researchers that assume a differentiation between an ‘objective’ and ‘subjective’ epistemic modality, there is no clear consensus as to whether the expression of these modalities is restricted to particular categories. Nevertheless, the majority of these authors concludes that epistemic adverbs strongly prefer a ‘subjective’ epistemic interpretation, whereas epistemic adjectives prefer an ‘objective’ epistemic interpretation. These assumptions reflect the fact that epistemic adjectives occur much more readily in environments in which epistemic adverbs hardly occur.

Given that a differentiation between an ‘objective’ and a ‘subjective’ epistemic modality does not exist, how is it possible then to account for these contrasts? Similar to epistemic modal verbs, epistemic adverbs and epistemic adjectives involve a variable for a deictic centre. It is plausible to assume that there are different conditions for adjectives and adverbs how this variable is anchored to an appropriate epistemic agent. As it seems, epistemic adjectives can be bound more locally, and, thus, it is less likely that something prevents the anchoring to this agent. In contrast, adverbs seem to underly stricter conditions of anchoring.

As it turns out, it is fairly contested as to what the true nature of ‘objective’ epistemic modality could be. Most of the approaches remain rather sketchy and only discuss a small amount of selected lexical items for each category. The most comprehensive study which has been undertaken by Nuyts (2001a,b) essentially departs from some of Lyons’ original assumptions. In particular, the concept ‘objective’ modality is replaced by the concept of ‘inter-subjective’ modality.

6.22.3 The role of public evidence

In contrast to the original proposal developed by Lyons (1977), the most elaborate contemporary approaches assume a distinction between ‘objective’ and ‘subjective’ epistemic modality invoke

an evidential dimension. Authors such as Diewald (1999, 79, 210), Nuyts (2001b, 393) Papafragou (2006, 1697) and Huitink (2008) implicitly or explicitly rely on the concept of public evidence. They conclude that ‘subjective’ epistemic modal operators involve evidence that is accessible to the speaker alone, whereas ‘objective’ epistemic modal operators involve evidence that is accessible to a bigger group of people.

However, as it has been already shown in Section 6.15, the concept of public evidence is impossible to model. The most obvious approach would be to regard it as a certain set of propositions *E* that is part of the knowledge of a bigger group. Based on this set of propositions, each person that is part of this bigger group should make the same assumptions or conclusions. This sort of approach only succeeds if there is ‘objective’ epistemic reasoning which only takes into consideration the part of the knowledge that is labelled as public evidence. Otherwise, if the ‘objective’ epistemic evaluation involved the entire individual knowledge of a speaker, it is not obvious that everyone would draw the same conclusions. Any account for ‘objective’ epistemic modality that is based on public evidence has to assume that there is a separate sort of reasoning which only affects the knowledge labelled as ‘public evidence’ and that ignores the rest of the knowledge. Such an assumption is very unnatural and requires independent neurological and psychological evidence.

Moreover, there are instances of ‘objective’ epistemic modal verbs for which the accessibility of the evidence does not at all play any role. Huitink (2008) assumes that quantifiers can only bear scope over ‘objective’ epistemic modal verbs. As it has been illustrated in Section 6.20, the accessibility of the evidence does not play a role in any of her own examples. They are perfectly acceptable even if the underlying evidence is accessible to the speaker alone. Thus, the reason why epistemic modal verbs can occur in the scope of a quantifier is not related to the degree of accessibility of the evidence.

This indicates that public evidence is a concept that presupposes unnatural assumptions about human reasoning. Moreover, it does not account for the phenomena it has originally been designed for.

6.22.4 Objective epistemic modal verbs do not constitute a consistent class

There are numerous properties which have been claimed to be essential for ‘objective’ epistemic modal verbs. However, at closer inspection, it turns out that most of these properties only apply to single modal verbs instead of the entire group which is considered as ‘objective’ epistemic. First of all, there are hardly clear statements as to which members the class of ‘objective’ epistemic modal verbs exactly comprises. In the original approach, Lyons (1977) almost exclusively discusses the ‘objective’ epistemic uses of *may*. Furthermore, he briefly mentions ‘objective’ epistemic variants of *must* (p. 797) and *can’t* (p. 801). Yet, there is no systematic enumeration as to which modal verbs he explicitly considers as capable to encode an ‘objective’ epistemic modality and which he does not. Watts (1984, 133) argues that *can* is never interpreted ‘subjective’ epistemically, only ‘objective’ epistemically. Tancredi (2007) and Huitink (2008, 4) seem to assume that epistemic modal verbs generally involve an ambiguity between ‘subjective’ and ‘objective’ epistemic modality.

As for German, the most explicit classification has been contributed by Öhlschläger (1989,

192) who argues that three modal verbs tolerate an ‘objective’ epistemic interpretation, *können*, *müssen* and *dürfte*. In a similar manner, Kratzer (1981, 58) claims that *dürfte* is ‘objective’ epistemic. Other authors such as Diewald (1999, 82–84, 274) only provide examples for *können* and *müssen*. Interestingly, she mainly discusses *können*.

The fact that authors such as Lyons (1977), Diewald (1999, 82–84), Tancredi (2007) and Huitink (2008) almost focus exclusively on the ‘objective’ epistemic uses of possibility verbs should cause some suspicion. The corpus study presented here reveals that a whole range of the essential properties for objective epistemic modal verbs that have been suggested in literature only applies to single modal verbs, rather than to the entire class of ‘objective’ epistemic modal verbs, no matter what extension is chosen. In particular, there is a clear asymmetry between possibility modal verbs and necessity modal verbs. The former are more flexible in their distributions, the latter are more restricted. In the remainder of this section, the three most revealing distributions which have been claimed to be essentially for the discrimination of ‘objective’ epistemic modal verbs will be briefly discussed: (i) questions, (ii) scope of a negation, (iii) scope of a quantifier.

First of all, Lyons (1977, 799) assumes that ‘objective’ epistemic modal verbs can occur in questions. In a similar vein, Watts (1984, 133) observes that ‘objective’ epistemic *can* occurs in polarity question, whereas epistemic *may* is excluded in such contexts:

An epistemic interpretation of *may* in *yes/no*-questions appears to be impossible. In the case of (9) and (10), however, what the speaker is questioning is whether the proposition is objectively possible, not what he himself believes possible.

As he argues, the incompatibility of *may* is due to its ‘subjective’ interpretation. However, his reasoning has interesting consequences. As he assumes that *may* can optionally express an ‘objective’ epistemic modality, it would be expected that it should be acceptable in questions, much in the way which ‘objective’ epistemic *can* is. These facts, in turn, lead Watts (1984, 138) to the conclusion that “Unless *may* is combined with one of the two modal adverbs *possibly* and *perhaps*, however, will almost certainly be interpreted subjectively.” Accordingly, most of the uses of *may* that are traditionally considered as ‘objective’ epistemic would turn out to be ‘subjective’ epistemic. Although his reasoning seems to be unconventional, Watts (1984) is nevertheless on the right track, as he addresses an important question: why is it that the possibility reading of *can* is so much more acceptable in questions than is *may*? This remains mysterious in any account which assumes that *may* involves an ‘objective’ epistemic interpretation. There is a more efficient explanation. As it has been illustrated by Hofmann (1976, 94), Coates (1983, 85), Sweetser (1990, 62), Brennan (1993, 14) and Drubig (2001, 43), the possibility verb *can* is special in that it does not involve an epistemic reading but just a pure possibility reading, as it is shown in Section 5.3. This explains why it can almost be used without restrictions in questions. In contrast, *may* does not seem to involve such a pure possibility reading, thus, it is always epistemic when it does not express a non-deontic possibility. As ‘subjective’ epistemic modal verbs require particular conditions in order to be felicitously used in information seeking questions, it becomes obvious as to why it is less acceptable in such a context, as opposed to its non-epistemic cognate *can*.

Likewise, there are only a couple of epistemic modal verbs that are attested in questions in German. As it has been demonstrated in Section 6.11 and 6.12, there are only three epistemic

modal verbs which could be found in questions: *kann*, *könnte* and *dürfte*. Roughly, they correspond to the group of verbs that Öhlschläger (1989, 192) considers as ‘objective’ epistemic. However, as it has been pointed out in much detail, all of these corpus examples rather exhibit a ‘subjective’ epistemic interpretation. Accordingly, the existence of configurations in which epistemic modal verbs occur in questions is nothing which necessitates the assumption of an independent ‘objective’ epistemic modality. If it was indeed the typical property of an ‘objective’ epistemic modal verb to be acceptable in interrogative contexts, it would remain mysterious as to why there are no examples for (‘objective’) epistemic *müssen* in these distributions. As it turns out, epistemic modal verbs only occur in questions under particular conditions. But this restriction cannot be adequately accounted for by assuming that all of these instances form a consistent subclass which expresses ‘objective’ epistemic modality. Rather, it is due to the interplay of idiosyncratic features of each lexical item.

Secondly, Öhlschläger (1989, 207) argues that it is a particular property of ‘objective’ epistemic modal verbs that they can occur in the scope of a negation whereas their ‘subjective’ cognates cannot. As it has been shown in Section 6.10, epistemic *können* and *müssen* are indeed frequently attested in the scope of a negation. Furthermore, there are a few occurrences of epistemic *brauchen* in the scope of a negation. In contrast, epistemic *dürfte* does not seem to be compatible with a wide scope negation. The negated instance of epistemic *dürfte* discussed by Öhlschläger (1989, 88) is far less natural than epistemic *können*, *müssen* and *brauchen* in the scope of a negation – if it is acceptable at all. This is extensively discussed in Section 6.10. The lesser degree of acceptability remains mysterious if *dürfte* did indeed exhibit an ‘objective’ epistemic interpretation. Alternatively, it is possible to conclude that negation may also affect ‘subjective’ epistemic modal operators. Such an approach is adopted by an increasing number of authors, such as Butler (2003, 984), Fintel and Iatridou (2003, 184), Papafragou (2006, 1694), Moscati (2006, 31) and Homer (2010, Sect. 3.1). Even Öhlschläger (1989, 208) concedes at some later point that subjective epistemic modal verbs can be affected by a negation. In that, he follows Lyons (1977, 801) who has already discussed such examples.

Thirdly, Huitink (2008) claims that it is the nature of ‘objective’ epistemic modal verbs to be able to occur in the scope of a quantifier (or universal free choice item). As it has been demonstrated in Section 6.20, this property does not apply to all the modal verbs which are consensually regarded as ‘objective’ epistemic. As for German, the configurations discussed by Huitink (2008) are only attested for *kann* and *könnte*. This holds in a similar manner for the cases provided by Tancredi (2007). All the examples involve the same lexical item: *may*. In total, this picture corresponds exactly to the observation made by Lyons (1977, 801f.) who came to the conclusion that epistemic possible verbs are more flexible in their distribution.

Summarising, the availability of epistemic modal verbs in non-canonical distributions is not governed by an independent ‘objective’ epistemic sub-category. If this were the case, it would be expected that all of the items which are regarded as ‘objective’ epistemic modal verb should occur in these environments. The acceptability of epistemic modal verbs is rather due to an interplay of idiosyncratic features. The most flexible epistemic verbs in German reviewed here are the possibility verbs *kann* and *könnte*: they are the most frequent epistemic modal verbs in conditional *wenn*-clauses, in information-seeking questions, in the scope of a negation or free choice items and finally it is attested in non-finite contexts. It is followed by *dürfte*, which occurs in questions and many adverbial clauses, and the necessity modal *müssen*, which occurs rarely

in the scope of a negation or non-finite. The behaviour of each individual epistemic modal verbs with respect to the non-canonic environments that are relevant here is illustrated in much detail in Figure 6.1. The judgements reflect the findings of the corpus study presented in the preceding sections. A ‘yes’ indicates solid corpus data, a ‘no’ is a sign that no data has been found and that any constructed example appears to be ungrammatical to an average native speaker. A blank just displays that no investigation has been carried out so far and that it is not excluded that the respective pattern is indeed in use.

As it appears, objective epistemic modality is a dustbin category that encompasses all of the cases of epistemic modal verbs which could not be accounted for by traditional accounts for epistemic modality. The examples that should justify the existence of an independent category of ‘objective’ epistemic modality are very selective and sporadic. For hardly any characteristic has it been empirically proven that it applies to each of the modal verbs which is said to involve an ‘objective’ epistemic interpretation. Under these circumstances, it is recommended to refute the concept of objective epistemic modality unless it is demonstrated that each verb which is regarded as ‘objective’ epistemic occurs in all environments which are only compatible with ‘objective’ epistemic modality but never with ‘subjective’ epistemic modality.

6.22.5 ‘Objective’ modal verbs that are practical possibility or quantificational modal verbs

In what follows, it will be demonstrated that some of the instances which are generally considered as ‘objective’ epistemic modal verbs do not involve any epistemicity at all. Furthermore, it will turn out that they can be alternatively analysed as practical possibility or quantificational modal verbs.

As it has been shown in Section 4.1.3, the most efficient way to define epistemicity is to follow the assumptions by Westmoreland (1998, 12) and Ziegeler (2006, 90) who argue that a speaker who employs an epistemic operator signals that the modified proposition is not part of his knowledge. In order to apply this condition, the epistemic operator needs to be anchored with respect to an agent, which is the speaker in the most canonical case. This is the essence of what is called (‘subjective’) epistemic modality. At closer inspection, it turns out that quite a lot of the instances which are regarded as ‘objective’ epistemic modal verbs do not meet these criteria. Diewald (1999, 82–84) provides a couple of examples for ‘objective’ epistemic modal verbs in German which should highlight their particular nature, as it is illustrated in (258), (259) and (260):

- (258) Können die Personen bei dringendem Tatverdacht festgenommen werden?
 can the persons at immediate suspicion arrest-PPP PASS.AUX-INF
 ‘If they are suspected immediately, can it happen that they will be arrested?’
- (259) Ich wußte, daß die Personen bei dringendem Tatverdacht festgenommen
 I knew that the persons at immediate suspicion arrest-PPP
 werden können.
 PASS.AUX-INF can
 ‘I knew that, if the persons were immediately suspected, they could be arrested.’

environment	<i>kann</i> (very rare)	<i>muss</i>	<i>dürfte</i>	<i>könnte</i>	<i>mögen</i> (rare)	epist. adverbs	part. <i>wohl</i>
factive complement		yes	yes	yes	yes	yes	
causal		yes	yes	yes	yes		yes
temporal		(yes)	yes	yes			yes
conditional	no	no		?? yes	no		no
negation	yes	yes	no	no	no	no	no
questions	yes	no	yes	yes	no		yes
quantifiers	yes	no	no	yes	no	no	
infinitive	yes	yes	no				
German							
Öhlschläger (1989)	objective	objective	objective		only subjective	only subjective	
Diewald (1999)	objective	objective			only subjective	only subjective	
Dutch							
Nuyts (2001)							
Huitink (2008)	objective	objective					

Figure 6.1: Epistemic modal verbs in non-canonical environments

6 Twenty one commandments for epistemic modality

- (260) Es dürfte regnen können.
it may.SBJV.PST rain can-INF
'It is probable that it can rain.'

Aside from their dominant deontic interpretation, the modal verb *können* in (258) and (259) also exhibits a non-deontic possibility reading. But crucially, these utterances are compatible with situations in which the deictic centre exactly knows that the suspicious persons were indeed arrested in at least one case.²⁰⁰ Likewise, the example (260) can be paraphrased as *I assume that it happens sometimes here that it rains*. In both cases, *können* seems to act as a quantifier over time intervals. Accordingly, it behaves exactly like a quantificational modal verb in terms of Brennan (1993, 97). In contrast, an epistemic modal verb can never be uttered in a situation in which the deictic centre knows that the modified proposition is true. In such a context, it will always be conceived as infelicitous.

6.22.6 'Objective' epistemic modal verbs that are 'subjective' epistemic modal verbs

After having demonstrated that a large part of 'objective' epistemic modal verbs can be more efficiently captured as circumstantial modal verbs, it will be shown here that there is no vital reason that prevents us from analysing the remaining part as 'subjective' epistemic modal verbs.

Among the current most elaborate proposals towards 'objective' epistemic modality, it is almost the general consensus that the essential difference between these two different types of epistemic modal operators concerns the accessibility of the evidence. Nuyts (2001b, 393), Papafragou (2006, 1694) and Huitink (2008) argue that the main characteristic of 'objective' epistemic modal verbs is that the epistemic evaluation is based on an evidence that is accessible to a larger group of people. Following Fintel and Gillies (2011, 115), Papafragou (2006, 1694) concludes that 'subjective' epistemic modals are the limiting case in which the speaker is the only member of the group and hence bases the modal claim on his or her private beliefs.

In order to prove the existence of 'objective' epistemic modal verbs, it is necessary to demonstrate that there are instances which are only acceptable if there is at least one further attitude holder that makes the same epistemic conclusion as the specified deictic centre – and this is very hard to prove. In a 'subjective' scenario, the deictic centre draws the conclusion *p* based upon his private evidence *E*, as is illustrated in (261). In contrast, an 'objective' scenario includes more acts of concluding, as demonstrated in (262).

- (261) deictic centre d_i concludes *p* based on the private evidence E_i
(262) deictic centre d_i concludes *p* based on the public evidence *E*
referent x_1 concludes *p* based on the public evidence *E*
...
referent x_n concludes *p* based on the public evidence *E*

²⁰⁰As the utterance in (258) involves a question operator, a context shift is induced where the deictic centre is identified with the addressee, as it is shown in Section 6.11.

It merits closer attention that the objective scenario always includes the subjective scenario, depending on how one phrases the difference between private and public evidence. As it has already been pointed out in Section 6.15 and 6.22.3, the concept of public evidence is problematic and moreover it makes wrong empirical predictions. Furthermore, it is doubtful as to whether the mind has a discrete mechanism of reasoning which only operates based on the set of propositions labelled as public evidence and that ignores the remaining knowledge.

So how is it possible to account for the ‘objective’ resonance which epistemic modal verbs occasionally seem to be associated with? Alternatively, one could assume that the judgements and evaluation that have been undertaken by other referents are part of the deictic centre’s knowledge or private evidence. What the deictic centre does in his own act of epistemic reasoning is to refer to evaluations from other judges, as it is illustrated in (263).

- (263) deictic centre d_i concludes p based on the private evidence E_i
 (whereas E_i includes judgements by other referents x_1-x_n that are relevant to p)

As it has been demonstrated above, the individual knowledge (private evidence) independently plays a crucial role for the definition of (‘subjective’) epistemic modality. A speaker that employs an epistemic operator indicates that the modified proposition is not part of his knowledge. As for public evidence, this is not the case. Thus, it appears to be much more reasonable to adopt an account that is based on the knowledge of the deictic centre, rather than on the concept of public evidence which is problematic for a whole bunch of reasons.

The consequence of the proposal outlined here is that ‘objective’ or ‘inter-subjective’ epistemic modality becomes a subtype of ‘subjective’ epistemic modality – except for those examples that have already been identified as practical possibility or necessity modal verbs or quantificational modal verbs. Any approach that insists to claim the existence of an independent ‘objective’ epistemic modality has yet to demonstrate that there are distributions in which this difference plays a role. As it has been shown in the last sections, all of the environments that have been claimed to be restricted to ‘objective’ epistemic operators can host operators with a ‘subjective’ epistemic interpretation. Thus, a distinction between ‘objective’ and ‘subjective’ epistemic operators cannot be motivated by the distributions in which they occur. This makes any attempt to formulate such a distinction irrelevant for linguistic theory.

Interestingly, Nuyts (2001b, 393) relativises the importance of the acceptability in different distributions for the distinction between ‘subjective’ and ‘inter-subjective’ modal verbs. As he puts it, “these behavioural properties have little or nothing to do with the issue of subjectivity”. The difference between ‘subjective’ and ‘inter-subjective’ modality boils down to a difference in the accessibility of the underlying evidence that has no implication for the syntactic or semantic behaviour of these items.

6.22.7 Conclusions

In the previous sections, it has been demonstrated that the assumption of an independent ‘objective’ epistemic modality is misleading. Firstly, all of the instances of modal verbs which were claimed to involve an ‘objective’ epistemic modal interpretation do not constitute a consistent class. In particular, most of the essential characteristics that are attributed to this class only apply to single members but never to all of them. As it has been illustrated, these inconsistencies are

not surprising: On the one hand, the class of ‘objective’ epistemic modal verbs encompasses items which indicate that the modified proposition is part of the speaker’s knowledge. Accordingly, they fulfil the central criterion for being a ‘subjective’ epistemic modal verb. On the other hand, this class contains items which do not fulfil this criterion. Thus, they behave like circumstantial modal verbs in the most crucial respect. Finally, some idiosyncratic properties of some particular epistemic modal verbs have been mistaken to be essential characteristics of ‘objective’ epistemic modality.

Aside from its lack of consistency, the concept of ‘objective’ epistemic modality faces at least two more serious challenges: it has been illustrated above that it is grounded on problematic concepts such as ‘public’ evidence and it is not plausible from a diachronic perspective.

But what necessitates the assumption of an independent ‘objective’ epistemic modality in the first place? Such an assumption becomes necessary if one considers that epistemic modifiers are a type of operator that is external to the proposition, or even external to the illocution. Most accounts in the tradition of Lyons (1977) conclude that epistemic modality is a proper illocutionary force and utterances that contain an epistemic modifier are to be seen as an independent type of speech act. As it is commonly assumed that illocutionary operators are excluded from a couple of environments such as questions or embedded clauses, such approaches would expect that epistemic modal verbs being illocutionary operators should also be exempt from these distributions. It has become apparent that there were some instances of epistemic modal verbs attested in these non-canonical distributions. Maintaining the hypothesis that epistemic modal verbs are illocutionary modifiers, these authors have concluded that these instances have to be another type of epistemic modal operator. This is the easy solution of this conflict: epistemic modal verbs are speech act modifiers and whenever they occur embedded in contexts from which they should be excluded, they involve another type of epistemic modality.

Refuting the concept of ‘objective’ epistemic modality, an alternative explanation becomes necessary for all those instances of epistemic modal verbs which occur embedded in complement clauses, adverbial clauses, in questions or in the scope of a negation. Firstly, it cannot be challenged that epistemic modal verbs are more easily interpreted in some environments rather than in others. Yet, the question arises as to how this difference of acceptability can be accounted for. As it has been illustrated above, the essential nature of epistemic operators is to indicate that the embedded proposition is not part of the knowledge of a particular attitude holder. In order to specify an epistemic operator for its attitude holder, the variable for the deictic centre has to be bound by an appropriate attitude holder. As it seems, the establishment of such a binding relation underlies specific conditions. Obviously, the deictic centre of an epistemic operator will always be anchored to the most local referent that is an appropriate attitude holder. This referent is the speaker in the case of non-embedded utterances that contain an epistemic operator. However, if this utterance is embedded by a predicate which involves an argument which can be interpreted as an epistemic agent, the most local attitude holder is the referent of this argument. Some operators may alter these conditions, such as question operators. Other operators may block the identification of the deictic centre, such as volitional operators. This account is further supported by the fact that even elements which are commonly considered as unambiguously ‘subjective’ epistemic occur in non-canonical contexts, such as epistemic adverbs *vielleicht* or epistemic discourse particles *wohl*. These occurrences remain unaccounted for under an account that is based on the distinction between ‘objective’ and ‘subjective’ epistemic modality. Thus,

it is more efficient to explain the different degrees of acceptability of epistemic modal verbs in non-canonical contexts in terms of anchoring conditions. How such analysis could be spelled out in more detail will be demonstrated in Section 8.

In order to maintain an account that distinguishes between an ‘objective’ and a ‘subjective’ epistemic modality, it would be necessary to prove a couple of hypotheses. Firstly, it remains to be shown that neither can be captured by the analysis for epistemic modals or the analysis for practical possibility/ necessity or quantificational modal verbs presented here. Secondly, it has to be demonstrated that the degree of accessibility of the underlying evidence has an impact on the acceptability of epistemic modal verbs in non-canonical contexts. Thirdly, it should be pointed out in great detail that characteristics which are attributed to the class of ‘objective’ epistemic modal verbs indeed apply to each of its members. Unless this is done, the concept of objective epistemic modality remains full of pitfalls and illusions. Thus, it is appropriate to abandon this idea.

6.23 Summary

The main result of this corpus survey is that epistemic modal verbs are much more flexible with respect to the environments in which they can occur. There are no more than eight out of twenty one non-canonical environments in which epistemic modal verbs could not be attested: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisations, (iv) they are exempt from adverbial infinitives, (v) finally, they cannot be embedded under circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. These conclusions are very similar to the ones drawn by Eide (2005, 9) for Norwegian. Apart from that, there are a couple of further environments in which epistemic modal verbs are at least exceptional, if not impossible such as event related conditionals, participles under a perfect tense auxiliary and temporal *wenn*-clauses. In all the remaining environments, epistemic modal verbs become interpretable if particular conditions are fulfilled.

How can the decrease of acceptability of epistemic modal verbs in non-canonical distributions be accounted for? There are a couple of competing accounts. Approaches in the tradition of Lyons (1977) assume that there are two types of epistemic modalities: ‘subjective’ epistemic modality which has an independent illocutionary force and which is external to the proposition. Accordingly, it is expected that ‘subjective’ epistemic modal modifiers should be excluded from the scope of operators that only bear scope over the proposition. In order to account for the existence of epistemic modal verbs which nevertheless occur in these environments, authors that defend such an approach assume that these occurrences involve a different type of epistemic modality: ‘objective’ epistemic modality. But as the results of the corpus study have illustrated, the concept of ‘objective’ epistemic suffers from essential shortcomings: first of all, the essential characteristics postulated for the class of ‘objective’ epistemic modal verbs do not apply to all the elements that are considered as members of this class. Furthermore, all of the known examples for ‘objective’ epistemic modal verbs can alternatively be captured as either circumstantial verbs or canonical (‘subjective’) epistemic modal verbs. This indicates that the concept of ‘objective’ epistemic modality should be abandoned unless it is shown that there is a consistent

distribution	deictic centre
infinitive (embedded by attitude predicate)	matrix argument
information seeking polarity question	addressee
information seeking <i>wh</i> question	addressee
non-factive complement clauses	matrix argument
factive complement clauses	matrix argument other salient referent speaker
event related causal clause	matrix argument speaker
event related conditional clause	addressee? speaker??
temporal clauses (with out generic <i>wenn</i> -clauses)	speaker
generic <i>wenn</i> -clauses	matrix argument
restrictive relative clause	speaker

Table 6.1: Anchoring of epistemic modal operators in embedded contexts

class of verbs to which it applies. Likewise, the constraints postulated by Coates (1983, 242) (*The Principle of Inviolability of Epistemic modality*) and Drubig (2001, 11) ('restriction to assertive contexts') cannot explain the occurrences of epistemic modal verbs in non-canonical contexts. In a similar fashion, accounts which assume that epistemic modal verbs are realised as a proper functional category which is restricted to finite environments fail to account for the data presented in this section, such as the analyses elaborated by Wurmbrand (2001, 184) and Erb (2001, 102).

All these accounts face a further challenge. As it has been demonstrated in the preceding sections, the deictic centre, which is in charge of the epistemic evaluation, is not identified in the same way in every context: whereas it is anchored to the speaker in non-embedded assertions, it is anchored to an appropriate matrix argument if the epistemic operator occurs in an embedded clause or to the addressee in information seeking questions. Hence, the orientation of the deictic centre is governed by the environment, as it is illustrated in Figure 6.1. This phenomenon remains unexplained in all the analyses sketched above. Any account towards epistemic modality has to involve some sort of variable designated for the attitude holder which undertakes the epistemic evaluation.

Moreover, most of the accounts discussed above assume that the class of epistemic modal verbs is homogeneous or that there are homogeneous 'objective' and 'subjective' epistemic subclasses. But as it has turned out, each lexical item is acceptable in different non-canonical distributions. Whereas epistemic *dürfte* is more compatible than the average with temporal clauses, it cannot occur non-finite or in the scope of a negation or an universal free choice item.²⁰¹ In contrast, epistemic *kann* is frequent in the scope of a negation or a free choice item, but it hardly occurs in adverbial clauses. Furthermore, epistemic *könnte* turns out to be very flexible in being acceptable in event related conditional clauses, in information seeking questions and in the scope of a universal free choice item, yet it is impossible in the scope of a negation. In opposi-

tion, epistemic *muss* is attested in the scope of a negation but excluded from information seeking questions. In order to account for the behaviour of epistemic modal verbs in non-canonical distributions, it is necessary to take into account all of the idiosyncratic lexical feature the respective verb involves. In quite a lot of contexts, an epistemic modal verb is not excluded because of its epistemicity alone, but rather due to a complex interplay with other lexical properties such as the modal force or subjunctive meaning. Once again, any account toward an adequate description of epistemic modal verbs has to consider the idiosyncratic lexical properties of each single verb.

The alternative account developed here is based on the assumption that an epistemic operator has to always be interpreted with respect to the knowledge of a particular attitude holder. In order to do so, the attitude holder has to be identified. However, the establishment of such an anchoring relation between the variable for the deictic centre provided by the epistemic operator and an appropriate attitude holder seems to be subject to clear conditions. As it will be demonstrated in further detail in Chapter 8, the epistemic operator has to be linked to the most local index which refers to an appropriate attitude holder. In such a configuration, certain operators must not intervene. Epistemic modal operators fail to be embedded under circumstantial modal verbs, predicates of desire, imperative operators and optative operators for the same reason. A volitional modal operator intervenes between the epistemic modal operator and the most local appropriate referent which is an attitude holder. Likewise, adverbial infinitives are headed by a modal operator. As a consequence, this modal operator intervenes between the epistemic modal operator and any attitude holder which is realised externally to the infinitive complement. Quite a lot of the non-canonical distributions reviewed above appear to involve an intervening modal operator which prevents the epistemic modal operator from being anchored to an appropriate attitude holder. Nevertheless, this is not the only reason as to why epistemic modal operators can be excluded in a particular environment. The reason as to why they do not occur with verbless directional phrase complements and as to why they cannot be separated from their infinitive complements in *wh*-clefts may have something to do with their selectional restrictions. The type of complement which they occur with in these environments is not suitable to denote a proposition.

Finally, the question as to what position epistemic modal operators occupy with respect to the proposition will not be fully solved here. There is much evidence in favour of the perspective developed by Papafragou (2006, 1693). She suggests that epistemic modal operators are part of the proposition as they can occur in central adverbial clauses and in the scope of a negation. The corpus study presented here could provide further support for this position. However, the data from epistemic modal operators in information seeking questions could be interpreted in a different manner. Epistemic modal operators in these configurations seem to yield the same interpretation as the one suggested by Zimmermann (2004, 263) for the discourse particle *wohl* in questions. As he argues, these operators have to be outside the proposition in order to make the right prediction in a Hamblin style analysis. As this matter is not a trivial one, the solution to this issue will be left to future research.

²⁰¹ Yet, there are authors such as Öhlschläger (1989, 88, 208) who argue that epistemic *dürfte* can be interpreted in the scope of a negation. As it has been demonstrated in Section 6.10, it is far from obvious to which extent his examples obtained from introspection indeed involve a wide scope interpretation of the negation.

7 Reportative and evidential modal operators

Whereas the preceding section were devoted to the environments in which epistemic modal verbs fail to occur, the upcoming Section deals with environments from which verbs with reportative and evidential semantics are banned. As it happens, there are contexts in which epistemic modal verbs are ruled out but in which reportative modal verbs occur. This contrast enables us to determine the nature of epistemic modal verbs on the one hand and reportative modal verbs and evidential verbs on the other hand.

7.1 Reportative *wollen* and *sollen*

As it has been shown in Section 4.2.3 and 4.2.6, *wollen* and *sollen* introduce an experiencer argument to which a volition can be attributed. Alternatively, the experiencer argument can be associated with a claim. The latter pattern is called reportative. Analogous patterns with the counterpart of *sollen* can also be found in other Germanic languages such as Dutch, Danish, Norwegian and Icelandic, as has been pointed out by Mortelmans et al. (2009) and Eide (2005, 393).

In Chapter 5, it has been demonstrated that the volitional interpretations of *wollen* and *sollen* relate to their reportative variants in an analogous way as the remaining circumstantial modal verbs relate to their epistemic variants. Volitional and the other circumstantial modal verbs fail to embed predications between an identified individual and a predicate that refers to a state that cannot be changed or to an event in the past. In contrast, reportative instances of *wollen* and *sollen* are perfectly acceptable with such types of predicates just as epistemic modal verbs are.

Yet, there are differences between reportative modal verbs and their epistemic counterparts. They become most notably evident as soon as the environments are taken into consideration in which these operators cannot occur. As pointed out by Doherty (1985, 118–119), Öhlschläger (1989, 236) and Reis (2001, 294, 296), the reportative uses of *wollen* and *sollen* systematically occur in environments from which epistemic modal verbs are categorically banned. From this it follows, that reportative modal verbs differ in essential respects. In what follows, only a selection of the non-environments for epistemic modal verbs which have been discussed in the previous section will be reviewed here. In particular, the following Section will focus on environments in which reportative modal verbs are attested and epistemic modal verbs are not.

Two types of environments have to be distinguished. Firstly, there are environments in which epistemic modal verbs are categorically ruled out and their reportative counterparts are not, such as (i) adverbial infinitives and infinitives which are embedded under an auxiliary, (ii) past participles that are embedded under a perfect tense auxiliary, (iii) nominalisations and (iv) optatives.

And secondly, environments can be found in which both types of modal verbs are acceptable but in which they yield different interpretations. In most of these environments, reportative modal verbs do not undergo a context shift such as, (v) in past tense contexts, (vi) in questions and (vii) in antecedents of event related conditionals.

7.1.1 Infinitives

As it has been demonstrated at length in Section 6.1, the use of epistemic modal verbs in non-finite contexts is fairly restricted. Such employments are only well attested in environments in which they are embedded by an attitude verb that introduces an appropriate referent that can serve as attitude holder. Accordingly, they could not be attested under verbs that lack such an attitude holder argument, such as tense auxiliaries, in corpora of Contemporary German. At this point, the example (7) in Section 6.1 will be ignored as it has a rather doubtful status. Likewise, epistemic modal verbs fail to be embedded in adverbial infinitives. In contrast, reportative modal verbs can occur in both contexts.

Infinitive complements of the auxiliary *werden*

As the examples (1) and (2) given by Curme (1922, 322) illustrate, the reportative modal verbs can be embedded under the tense auxiliary *werden*. As auxiliaries lack any argument structure, *werden* does not introduce any argument that could be interpreted as attitude holder. Accordingly, there would be no viable referent that could be identified as the deictic centre. As a result, an epistemic modal verb is excluded from such an environment. However, reportative modal verbs are not subject to this condition and, as a consequence, they can be embedded under verbs and auxiliaries that do not provide any attitude holder argument. Yet, another configuration that lacks an appropriate argument that can be identified as deictic centre is provided by Welke (1965, 81). In the example (3), the *zu*-infinitive complement is selected by the noun (*Illusion*) ‘illusion’, which does not involve any appropriate argument. An analogous example is given in (4):

- (1) Er wird es wieder nicht gehört haben wollen.¹
 he will it again NEG heard have want-INF
 ‘He will claim again that he didn’t hear it.’
- (2) Ich werde es wieder getan haben sollen.²
 I will it again do-PPP have-INF shall-INF
 ‘It will be said again that I did it.’
- (3) Alles schon endgültig durchschaut haben zu wollen, ist höchstens
 everything already definitely look.through-PPP have-INF to want-INF is at.most
 die Illusion selbstzufriedener Kleingeister.³
 the illusion complacent small.minds
 ‘The claim of having already understood everything is an illusion of complacent small minds.’

¹Gloss translated by Curme.

²Gloss translated by Curme.

³As quoted in Welke (1965, 81).

- (4) Und schließen einen damit aus. Machen einem die Vermessenheit klar,
and lock one with.that out make one the impudence clear
etwas begriffen haben zu wollen.⁴
something understand-PPP have-INF to want
'[they] exclude you therefore. [they] make it clear to you how impudent it is to claim that they
have understood something.'

Letnes (2002, 108) points out that, besides from its canonical future interpretation, *werden* can alternatively be interpreted as epistemic modal verb in Curme's example (1).

Eide (2005, 393) provides similar examples of the Norwegian reportative modal verb *skulle* 'shall', 'is.claimed.to' which occur in non-finite environments.

Adverbial infinitives

Crucially, reportative *wollen* is attested in adverbial infinitives which are headed by the complementiser *ohne* 'without', as is illustrated in (5) and (6).

- (5) Ohne das Finale von „Casablanca“ jemals gesehen haben zu wollen, läßt
without the final fo Casablanca ever see-PPP have-INF to want let
Schlesinger seine bittersüße Romanze wie ein Remake mit der Bergmann-Tochter
Schlesinger his bittersweet romance as a remake with the Bergmann.daughter
ausklingen. Wer's glaubt wird selig, der blutleere Versuch eines
die.away the blood.empty attempt
romantischen Thrillers wird dadurch allenfalls nostalgisch.⁵

'Despite Schlesinger's claims that he never saw the end of "Casablanca", his bittersweet romance ends as if it was a remake with Bergmann's daughter – Schlesinger's claims are hard to believe and his attempt to create a romantic thriller brings about a resonance of nostalgia.'

- (6) Schließlich gab Sabine Marker nach und setzte ihre Unterschrift auf die Erklärung,
finally gave Sabine Marker after and put her signature on the declaration
ohne gewusst haben zu wollen, was sie da unterzeichnet.⁶
without know-PPP have-INF to want-INF what she there signs
'Finally, Sabine Marker complied and put her signature under the declaration and now she
claims that she did not know what she was signing.'

Adverbial *ohne zu* infinitives provide an interesting case. They involve a subject argument which is non overtly expressed and which needs to be controlled by an NP. In the most canonical case, this is the subject argument of the matrix clause. Accordingly, the matrix clause has to contain a predicate that introduces an animate subject argument which can be interpreted as an attitude holder.

These patterns could only be attested with reportative *wollen*. It is not solved yet, whether they are also compatible with *sollen*.

⁴DeReKo: P96/AUG.30600 Die Presse, 17.08. 1996.

⁵DeReKo: NUN93/SEP.01173 Nürnberger Nachrichten, 17.09. 1993.

⁶DeReKo: NUN10/OKT.03036 Nürnberger Nachrichten, 29.10. 2010.

7.1.2 Past participles

As shown in Section 6.2, the use of epistemic modal verbs as past participles is fairly limited. Such configurations are acceptable, only if the perfect tense auxiliary *haben* is inflected for subjunctive of the past. Yet, epistemic modal verbs are ungrammatical as soon as they are embedded under a perfect tense auxiliary which is inflected for the indicative. As a consequence, epistemic modal verbs are hardly compatible with the canonical perfect tense in Contemporary German.

Yet, this is not the case with reportative modal verbs. As illustrated by Reis (2001, 294), both reportative *wollen* and *sollen* can be embedded under an indicative perfect tense auxiliary displaying the IPP effect (7)–(8). An authentic example is provided by Vernaleken (1861, 96), cf. (9):

- (7) Hans hat mal wieder an allem unschuldig sein wollen.
 Hans has once again on everything innocent be-INF want-PPP(ipp)
 ‘He will claim again that he didn’t hear it.’
- (8) Hans hat mal wieder an allem unschuldig sein sollen.
 Hans has once again on everything innocent be-INF shall-PPP(ipp)
 ‘It will be claimed again that he didn’t hear it.’
- (9) Einige haben bemerken wollen, dass die thiere die eigenschaft der
 some have notice-INF want-PPP(ipp) that the animals the property the-GEN
 einwohner ihrer länder haben.⁷
 inhabitants-GEN their-GEN countries-GEN have
 ‘Some claim to have noticed that the animals have the properties of the inhabitants of their particular countries have.’

A similar collection of examples can be found in Fagan (2001, 200, 225), who demonstrates that reportative and epistemic modal verbs differ with respect to the degree of acceptability in perfect tense environments.

7.1.3 Nominalisations

As it has already been illustrated in Section 6.5, epistemic modal verbs fail to undergo nominalisations. In opposition to this, reportative *wollen* and *sollen* are attested in such configurations: *Bescheidwissenwollen* ‘answer.know-INF.want-INF.NOUN’ (10), *Nicht-gewussthaben-Wollen* ‘NEG.know-PPP.have-INF.want-INF.NOUN’ (11) and *Wissensollen* ‘know-INF.shall-INF.NOUN’ (12).

- (10) Dieser Mann, der so entschieden die Unmittelbarkeit der Begegnung
 this man who so resolutely the immediacy the-GEN encounter-GEN
 gegen jede Art von Bescheidwissenwollen, Wahrheitsanspruch und
 against each type of answer.know-INF.want-INF.NOUN truth.claim and

⁷Johann Winkelmanns, *Geschichte der Kunst des Alterthums*. Dresden: bei Walther, p.19 1. Kapitel, 3. Stück, (1764).

Rechthaberei verteidigt, soll also keine Ahnung haben, wie alt seine Tochter
 bossiness defends shall thus no idea have-INF how old his daughter
 ist (nämlich 18)⁸
 is (namely 18)

‘This man, who defends any type of pretentiousness, truth claim and bossiness in such a resolute manner, does he have really no idea how old his daughter is (namely 18)?’

- (11) Inzwischen hat es auch in Deutschland – Stichwort Daniel Goldhagen („Hitlers
 meanwhile has it also in Germany keyword Daniel Goldhagen Hitler-GEN
 willige Vollstrecker“) und Jonathan Littell („Die Wohlgesinnten“) – viel
 willing executioners“ and Jonathan Littell the kindly.ones – much
 Selbstbesinnung und heftige Debatten um individuelle und kollektive deutsche
 reflection and fierce debates about individual and collective german
 Nachkriegs-Lebenslügen zwischen Nicht-Wissen und
 post.war.live.lies between NEG.know-INF and
 Nicht-gewussthaben-Wollen gegeben.⁹
 NEG.know-PPP.have-INF.want-INF.NOUN give-PPP

‘Meanwhile, there have also been discussions in Germany about individual and collective
 lifelong lies, ranging from ignorance to the denial of knowledge, which have been triggered by
 Daniel Goldhagen “Hitler’s Willing Executioners” and Jonathan Littell “The Kindly Ones”.’

- (12) Gesamthaft genommen ergibt sich, dass individuelles Wissenssollen
 in.total taken yields REFL that individual know-INF.shall-INF.NOUN
 oder Wissenkönnen in bezug auf den Raubgutcharakter der bei
 or know-INF.can-INF.NOUN in relation to the loot.character the-GEN at
 Fischer gekauften Bilder dem Kläger nicht nachgewiesen ist.¹⁰
 Fischer bought picture the complainant NEG approved is

‘In total, it turns out that it has not been proven that anyone could or should have known that
 the pictures bought from Fischer were loot.’

At this point the question arises, why reportative modal verbs are acceptable in such an environment whereas epistemic modal verbs are ruled out. This could be due to the degree of argument structure the respective verbs involve. Reportative *wollen* and *sollen* both introduce arguments on their own which encode the deictic centre. Accordingly, the variable for the deictic centre which is introduced by the modal operator can be bound locally. This is not the case with epistemic modal verbs. Their variable for the deictic centre remains unbound.

7.1.4 Optatives

As already shown in Section 6.14, epistemic modal verbs cannot occur in optatives. In contrast, reportative *wollen* is marginally acceptable in such patterns. Scholz (1991, 276) has illustrated this claim with the following example.

⁸DeReKo: NUN03/DEZ.00184 Nürnberger Nachrichten, 02.12. 2003.

⁹DeReKo: RHZ09/AUG.06760 Rhein-Zeitung, 10.08. 2009.

¹⁰DeReKo: E96/OKT.26335 Zürcher Tagesanzeiger, 16.10. 1996.

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- (13) ? Wollte Karl doch nicht immer der Beste gewesen sein!¹¹
want-SBJV.PST Karl PART NEG always the best be-PPP be-INF
'(I wish) Karl would not have always claimed to be the best.'

Even if such utterances are rather rare, they are possible and to a significantly higher degree acceptable than epistemic modal verbs in optatives are. At this point, the question arises what enables reportative *wollen* to occur in such a context. In the most canonical case, the optative reflects a wish of the speaker. Accordingly, optatives introduce some sort of a volitional operator that takes scope over the proposition. As it has been argued by Cinque (1999, 87) and Eide (2005, 9), epistemic modal verbs cannot be embedded under a circumstantial modal operator. As it appears, reportative *wollen* is exempt from this condition.

Once again, it seems that the reason for the different behaviour of epistemic modal verbs and reportative modal verbs is due to the status of the variable for the deictic centre which they introduce. In the case of reportative modal verbs, this variable is already bound by an argument of the modal verb itself whereas, for epistemic modal verbs, this variable is left unbound. Obviously, no unbound variable is admitted under a circumstantial modal operator.

7.1.5 Past Tense

As it has been shown in Section 6.3, epistemic modal verbs are fairly restricted in past contexts. They can obtain two types of interpretation. In the more canonical reading, they involve a context shift which regards the Time of Evaluation. Accordingly, the presence of past morphology indicates that the speaker or some other deictic centre specified by the context made an assumption in the past. This assumption is reported at the Time of Utterance. Typically, the pronunciation of the utterance is temporally detached from the time of the epistemic evaluation. And most often, the person who makes the utterance is identical to the person who undertakes the evaluation. This interpretation can be called *past speech event reading*. Apart from that, there is a second interpretation, the *past event reading*. In this configuration, the past morphology on the epistemic modal verb indicates that the Topic Time of the embedded event is shifted to the past. However, this interpretation does only arise under conditions which have not been investigated yet. With *konnte*, these readings hardly exist. They are only attested with *musste* and *mochte*.

Turning to the reportative modal verbs, the situation is different. They are characterised by two different properties. Firstly, both verbs *wollte* and *sollte* are only attested in one interpretation when they bear past morphology. It roughly corresponds to the *past speech event reading*. The epistemic evaluation by deictic centre is shifted to the past. In the case of *wollte*, the deictic centre is instantiated by the referent of the subject argument of the reportative modal verb, in the case of *sollte* it is identified with an argument referent that remains covert and that is specified by the context. This is illustrated in example (14) for *wollte*, in example (15) for *sollte* and in example (16) for both verbs.

- (14) Dem gegenüber meinten der 22-jährige Hauptangeklagte, der als einziger in
this opposite said the 22-year.old main.accused who as only in

¹¹ As cited in Scholz (1991, 277). The acceptability judgement reflect those of the author.

U-Haft sitzt, und sein Kompagnon, Wolfgang Fasching und imprisonment.on.remand sits and his companion Wolfgang Fasching and dessen Freund hätten sich aktiv eingemischt und einen der his friend have-SBJV.PST REFL actively intervened and one the-GEN beiden von hinten festgehalten. Während der Hauptbeschuldigte nur den both-GEN from behind grabbed while the main.accused only the Freund des FPÖ-Mandatars weggestoßen haben wollte, gab sein friend the-GEN FPÖ-mandatory-GEN away.pushed have-INF want-PST gave his Kompagnon zwei Faustschläge gegen Wolfgang F. zu. Aber: Einen Aschenbecher companion two fist.punches against Wolfgang F. to but a ashtray wollte keiner der beiden vor dem Lokal benutzt haben. Als want-PST none the-GEN both-GEN in.front.of the bar use-PPP have-INF as Wolfgang F. und sein Begleiter am Boden lagen, wollten sie auch nicht auf Wolfgang F. and his escort on.the floor lied want-PST they also NEG at die beiden eingetreten haben. Sie seien vielmehr nach den Fausthieben the both kick-PPP have-INF they be-PRS.SBJV rather after the fist.punches geflüchtet.¹²

escape-PPP

‘In opposition to that, the 22 year old main accused, who is the only one in imprisonment on remand, and his companion, said that Wolfgang Fasching and his friend had actively intervened and that they grabbed one of the two. Whereas the main accused claimed to have only pushed away the friend of the FPÖ-mandatory, his companion admitted two punches against Wolfgang F.. And they claimed that they did not use an ashtray in front of the bar. Likewise, they claimed that they did not kick the two when they were already lying on the floor. Rather, they would have escaped right after the punches.’

- (15) In Handschellen betrat der 26-jährige Angeklagte gestern den in handcuff entered the 26.year.old accused yesterday the Verhandlungssaal im Amtsgericht Gifhorn. Er sollte Haschisch an einen trial.room in.the district.court Gifhorn he shall-PST hashish to a Minderjährigen verschenkt haben – ein Verbrechen, für das er sich vor dem minor offer-PPP have-INF a crime for that he REFL at the Schöffengericht verantworten musste und das mindestens mit einem court.of.lay.assessors face.charge-INF must-PST and that at.least with a Jahr Freiheitsstrafe geahndet wird.¹³
- year prison.sentence punished is

‘The 26 year old accused entered the trial room at the district court Gifhorn in handcuffs. He was claimed to have offered hashish to a minor which is a crime for which he had to face a charge at the court of lay assessors and for which one is punished with a prison sentence of at least one year.’

¹²<http://www.oe24.at/oesterreich/chronik/wien/Hooligan-verpruegelte-FP-Politiker-Prozess/55847185>, accessed on 10th February 2012.

¹³DeReKo: BRZ09/MAR.01458 Braunschweiger Zeitung, 04.03. 2009.

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- (16) Swerkow erzählte von irgendeiner üppigen Dame, die er zu guter Letzt so weit gebracht haben **wollte**, daß sie ihm eine Liebeserklärung machte far get-PPP have-INF want-PST that he him a love.confession made (natürlich log er wie gedruckt). Und wie ihm in dieser Affäre sein intimer (of.course lied he as printed) and how him in this affair his intimate Freund, irgendein Fürstchen, the Husarenoffizier Kolja, der dreitausend friend some Count-DIM the hussar.officer Kolja who three.thousand Leibeigene besitzen **sollte**, besonders hilfreich gewesen wäre.¹⁴ bondsmen own-INF shall-PST particularly helpful be-PPP be-SBJV.PST
 ‘Swerkow talked about some voluptuous lady. He claimed that he finally made her confess to him her love (Of course he was lying through his teeth.) And how in this affair an intimate friend, some Count, the Hussar officer Kolja, who was claimed to own three thousand bondsmen, particularly bore a helping hand.’

However, reportative modal verbs differ in a major respect from epistemic modal verbs with respect to the *past speech event reading*. Epistemic modal verbs introduce a variable for the deictic centre and this variable is most typically anchored to the speaker. In contrast, the variable for the deictic centre which is introduced by reportative modal verbs is always instantiated as an argument referent of the modal verb itself. Whereas the variable is instantiated across several boundaries in the case of epistemic modal verbs, the instantiation of the variable for the deictic centre is a very local configuration in the case of reportative modal verbs. As for epistemic modal verbs, the variable remains open and unbound when the past tense operator is applied. In opposition, the variable for the deictic centre is already instantiated, when a past operator is combined with a reportative modal verb.

From this it follows, that a deictic centre that is associated with a reportative modal verb can never be identical to the speaker, and that the person who utters the sentence is always distinct from the person who undertakes the epistemic evaluation.

Furthermore, the different status of the variable of the deictic centre explains two riddles. Firstly, the observation made by Reis (2001, 294, 296) becomes less mysterious, who has demonstrated that reportative modal verbs occur more readily in past tense contexts. If the variable of the deictic centre is already identified of a very local level, no further conditions for the identification have to be considered. Secondly, it can be explained why epistemic modal verbs undergo a context shift in their *past speech event reading*, which has been discussed in Section 6.3. In this interpretation, epistemic modal verbs become more like reportative modal verbs: the deictic centre can be identified with a referent that is different from the speaker. At this point, it remains mysterious what enables the variable to be instantiated by another referent. One could assume that a past tense operator that bears scope over an epistemic operator prefers that the variable should already be instantiated rather being left open. Accordingly, it is plausible to conclude that a rule of accommodation in the manner suggested by Lewis (1979, 172) and Kratzer (1981, 61) applies which identifies the variable. Even if one assumes that epistemic modal verbs in reported indirect speech are licenced by some type of covert super ordinate at-

¹⁴Fyodor Mikhaylowich Dostoyewsky *Aufzeichnungen aus dem Kellerloch*, translated by Svetlana Geier, 87. 2003.

titude predicate or verb of saying, one still remains concerned with an open variable under a past tense operator, which is not tolerated in canonical contexts. Accordingly, it is essential to provide an analysis on how the variable of the deictic centre is bound in these contexts.

7.1.6 Questions

As discussed in Section 6.11 and Section 6.12, epistemic modal verbs underly certain restrictions when they are embedded in information seeking questions. There are only three epistemic uses which are attested in questions: *kann*, *könnte*, *dürfte*. Epistemic necessity modal verbs do not seem to be compatible with such an environment

Following the assumptions made by Becker (1836, 181) and Bech (1949, 5, 39), volitional verbs *wollen* and *sollen* and their reportative counterparts involve a necessity operator, as demonstrated in Section 4.2.3 and Section 4.2.6. In contrast to epistemic necessity modal verbs, reportative modal verbs can occur in polarity questions and *wh*-questions, as shown by Doherty (1985, 118–119) and Reis (2001, 296). Both authors stress that reportative modal verbs are significantly more acceptable in information seeking questions than epistemic modal verbs are. Reis (2001, 296) provides the examples (17) and (18).

- (17) Will er mal wieder in Prag gewesen sein?
shall he once more in Prague be-PPP be-INF
'Does he claim again to have been to Prague?'
- (18) Soll er mal wieder in Prag gewesen sein?
shall he once more in Prague be-PPP be-INF
'Is he allegedly in Prague again?'

Such configurations are also attested in corpora for *wollen* (19) and *sollen* (20)–(21) in polarity questions.

- (19) Will Uderzo mit dieser Abrundung seines (und Goscinnys) Lebenswerks
wants Uderzo with this completion his-GEN and Goscinnny-GEN lifework
vielleicht wirklich endgültig den letzten Band herausgebracht haben?¹⁵
maybe indeed definitely the last volume edit-PPP have-INF
'Does Uderzo really want to say that this is definitely the last volume which he has edited of his and Goscinnny's lifework?'
- (20) Mehr Sorgen macht Mercedes die Unfallursache. „Die Felge hatte erst 14
more worries makes Mercedes the accident.cause the rim had only 14
Kilometer drauf, sie war also brandneu“, verrät Teamchef Ron Dennis,
kilometres on she was thus brand.new team.manager reveals Ron Dennis
der glaubt, dass ein kleines Teil (Stein oder Kohlefaser) zwischen Bremsscheibe
who believes that a small part stone or carbon between brake.disc

¹⁵DeReKo: RHZ96/OKT.06061 Rhein-Zeitung, 10.10.1996.

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und Felge zum Bruch führte. Experte Keke Rosberg (59) findet es absurd:
and rim to.the break lead expert Keke Rosberg (59) considers this absurd
„Soll da ein Spatz reingeflogen sein oder was?“¹⁶
shall there a sparrow in.flown-PPP be-INF or what
‘Mercedes is more concerned about the cause of the accident. “The rim has only done 14 kilometres, thus, it was brand new.” team manager Ron Dennis reveals, who believes that a small piece of carbon or a stone came between the brake disc and the rim and caused the break. The expert Keke Rosberg (59) considers this to be absurd: “Does somebody really want to claim that a sparrow flew into it? ” ’

- (21) Er behauptete, die Mutter habe das Kind häufig misshandelt. Soll Monja H. ihr
he claimed the mother has the child often abused shall Monja H. her
eigenes Kind getötet haben? Das glaubt der Staatsanwalt nicht.¹⁷
own child kill-PPP have-INF that believes the prosecutor NEG
‘He claimed the mother has regularly abused the child. Does he really want to say that she has killed her own child? The prosecutor does not believe this.’

Moreover, reportative *wollen* and *sollen* can be found in *wh*-questions, as it is illustrated in (22)–(26):

- (22) Wo will Grass eine Tabuisierung von Israel-Kritik entdeckt haben? Kein
where wants Grass a taboo of Israel.criticism find-PPP have-INF no
anderes Land wird so viel kritisiert wie Israel.¹⁸
other country is so much criticised as Israel
‘Where does Grass claim to have found a criticism of Israel? No other country is subject to as much criticism as Israel is.’
- (23) Die Begründung mit der mangelnden „medialen Rezeption“ ist doch unsinnig. Wer
the statement with the lacking medial reception is PART insane who
will die gemessen haben?¹⁹
wants that measure-PPP have-INF
‘The statement about the lacking “medial reception” is insane. Who claims to have measured this?’
- (24) Mobbing-Opfer sollten aufschreiben, wenn sie jemand verletzt hat. Meist
mobbing.victims should down.write if they somebody injured has mostly
fragt das Gegenüber im Gespräch: „Wann soll das gewesen sein?“. Dann sind
asks the counterpart in.the talk when shall this be-PPP be-INF then are
Notizen hilfreich.²⁰
notices helpful

¹⁶DeReKo: HMP08/APR.02557 Hamburger Morgenpost, 29.04. 2008.

¹⁷DeReKo: HMP06/MAR.00369 Hamburger Morgenpost, 03.03. 2006.

¹⁸DeReKo: RHZ12/MAI.09565 Rhein-Zeitung, 09.05.2012.

¹⁹WDD11/H55.66116: Diskussion: Hiltrud Breyer/Archiv, In: Wikipedia –
URL:http://de.wikipedia.org/wiki/Diskussion:Hiltrud_Breyer/Archiv: Wikipedia, 2011.

‘Victims of mobbing should write down whenever they have been injured. Mostly, the counterpart will ask: When is it claimed to have happened?/When do you claim to have happened? In this situation, it is helpful to have notices.’

- (25) Bei einem Freistoß für uns forderte er zweimal die neun Meter Abstand.
 at.the a free.kick for us reclaimed he twice the nine meters distance
 Wo soll da die Kritik gewesen sein?²¹
 where shall there the criticism be-PPP be-INF
 ‘At a free kick, he reclaimed twice a distance of nine meters. What is claimed to be critical about that?/Is there anything that could be considered as criticism?’
- (26) „Man hat Sie gesehen an diesem Montag früh. Zur Tatzeit. Auf dem
 one has you seen on this Monday morning at.the.time.of.offence on the
 Kirchplatz.“ Also doch nicht die Willke. Katalina Cavic. Aus irgendwelchen
 church.square thus NEG the Willke Katalina Cavic for some
 Gründen fand sie das schade. „Und wer soll mich gesehen haben?“ Sie zog
 reasons found she that pity and who shall me see-PPP have-INF she raised
 die Augenbrauen hoch. „Das tut nichts zur Sache“, sagte Köster streng.²²
 her eyebrow high that does nothing to.the cause said Köster severely
 ‘“You were seen on Monday morning. At the time of offence. At the church square.” Thus, it wasn’t Wilke. Katalina Cavic. For some reason, she was disappointed. “And who is claimed to have seen me?” She raised her eyebrow. “This doesn’t change anything.” Köster answered severely.’

The behaviour of reportative modal verbs in questions differs from the one of epistemic modal verbs in two essential respects. Firstly, epistemic necessity modals are not compatible with such an environment. In opposition, reportative modal verbs are commonly considered as specific types of necessity modal operators. Nevertheless, they are acceptable in all types of information seeking questions.

Secondly, epistemic *kann*, *könnte* and *dürfte* are subject to a context shift, whenever embedded in information seeking questions. The deictic centre is no longer identified with the speaker but, rather, it will be anchored to the addressee. In contrast, reportative modal verbs do not involve such a context shift when they occur in information seeking questions. In the case of reportative *wollen*, the deictic centre remains to be identified with the referent of its subject argument, as is illustrated in (19) and (22). It is not easy to find an appropriate gloss for these examples, as the interaction of the reportative modal operator and the question operator is a little bit obscure and remains to be investigated in more detail. In general, reportative *wollen* is not very frequently attested in questions.²³

The case of *sollen* is a little bit different. In canonical declarative clauses, the deictic centre introduced by *sollen* is linked to a salient referent which does not need to be overtly specified.

²⁰RHZ07/FEB.05994 Rhein-Zeitung, 07.02.2007.

²¹NON09/OKT.14910 Niederösterreichische Nachrichten, 26.10.2009.

²²BRZ07/MAR.00092 Braunschweiger Zeitung, 23.03.2007.

²³An investigation based the tagged archive T of the DeReKo carried out on out 26th May 2012 did not yield any results. It employed the queries Will /s0 (MORPH(V PCP PERF) sein) and and Will /s0 (MORPH(V PCP PERF) haben).

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The behaviour of *sollen* does not change in questions: in (20)–(21) and (24)–(26), the deictic centre is instantiated by a salient individual that is provided by the context. Of course, one could argue that there are plenty of examples in which the deictic centre of reportative *sollen* tends to be identified with the addressee, as is illustrated in the examples (24) or (26). Yet, this is no particular property of reportative *sollen* in questions. As the deictic centre can be identified with any referent which is contextually supplied, it can also be anchored to the addressee, even in declarative clauses. Summing up, it turns out that reportative modal verbs do not undergo any context shift whenever they are used in questions whereas epistemic modal verbs always will.

The only issue which remains to be settled, is why it is so difficult to obtain a precise paraphrase of reportative modal verbs in questions. This could be due to a phenomenon that has been unmasked by Schenner (2009, 188), who has illustrated that reportative modal verbs that are embedded in complement clauses can yield three different types of interpretations: (i) an *assertive* interpretation in which the deictic centre is salient from the context and not identical to the attitude holder specified in the matrix clause (ii) a *global* which is in large parts analogous to the *assertive* interpretation but which is restricted to contexts in which the matrix predicate is (implicitly) negated. The reportative modal verb conveys a meaning like *as it is alleged*. (iii) Finally, there is a *concord* interpretation in which the deictic centre of the embedded verb is identified with the attitude holder argument of the matrix predicate. It remains to be checked, to what extent the first two interpretations may occur in questions and to what extent they could resolve the difficulties to paraphrase. As questions are negative polarity environments, it is fairly plausible that the reportative instances above involve a *global* interpretation.

7.1.7 Event related conditional clauses

As it has been shown in Section 6.17, epistemic modal verbs are hardly compatible with antecedents of event related conditional clauses. The very few examples that come into consideration are characterised by two properties: firstly, they all contain an epistemic instance of the form *könnte* and they appear to be impossible with epistemic necessity modal operators. Secondly, all of the attested examples involve a context shift in which the deictic centre is linked to the addressee, rather than to the speaker. This is reminiscent of the behaviour of epistemic modal verbs in questions. And indeed, as it has been pointed out above, there are substantial parallels that indicate a close relation between the two clause types.

Turning to reportative modal verbs, they are also attested in event related conditional clauses. Yet, they behave differently from epistemic modal verbs in conditionals in two essential respects. Firstly, they involve a modal necessity operator. Secondly, they do not undergo a context shift. They exhibit a similar behaviour as reportative modal verbs in questions, as illustrated in (27) and (28):

- (27) Entsprechend panisch reagieren viele, wenn in der Region ein „Kinderansprecher“
correspondingly panic react many if in the region a child accoster
aufgetaucht sein soll.²⁴
appear-PPP be-INF shall

²⁴DeReKo: RHZ07/OKT.04281 Rhein-Zeitung, 05.10. 2007.

‘In an according panic-fuelled manner, many people react if there is a rumour about a man who accosts children in the region.’

- (28) Ein Sicherungsverfahren wird dann durchgeführt, wenn der Angeklagte bei
a protection.action is then out.carried if the accused at
Begehung der Tat schuldunfähig im Sinne von § 20 StGB
commitment the-GEN crime-GEN criminally.incapable in.the sense of § 20 StGB
gewesen sein soll, aber eine isolierte Maßregel der Besserung und
be-PPP be-INF shall but a isolated measure the-GEN amendment-GEN and
Sicherung verhängt werden muss, weil der Täter aufgrund
protection-GEN impose-PPP PASS.AUX-INF must because the culprit due
seines Zustandes für die Allgemeinheit gefährlich ist.²⁵
his state for the community dangerous is

‘An action of protection is undertaken in the case in which the accused is claimed to be criminally incapable in the sense of § 20 StGB during the committing of the crime and if a measure of the amendment and protection has to be imposed because the culprit is dangerous for the community due to his state.’

In a similar vein, Öhlschläger (1989, 236) argues that reportative modal verbs are more readily acceptable in antecedents of conditional clauses than epistemic modal verbs are. Yet, his examples involve echoic antecedents and, thus, they cannot be event related conditionals. Rather, they should be analysed as speech act conditionals which behave fairly differently in syntactic and semantic respect.

Likewise, a speech act related interpretation is also possible for the examples above, as the antecedents can alternatively be interpreted in an echoic manner. Nevertheless, there are good reasons that they are event related conditionals. As Eisenberg (2004, 346) has pointed out, there are two types of correlates which can occur in the consequent of conditional clauses: *dann*-correlates and *so*. Whereas the first type is typical for event related or temporal conditionals, the latter is characteristic of epistemic conditionals. A similar observation has been made by Reis and Wöllstein (2010, 143). As the conditional in example (28) involves a consequent clause which contains the correlate *dann*, an event related interpretation appears to be more favourable.

At any rate, if the examples above and the ones with epistemic modal verbs discussed in Section 6.17 turn out to involve speech act related conditionals, this does not affect that epistemic modal verbs and reportative modal verbs behave differently with respect to this environment. Whereas epistemic modal verbs in conditional clauses undergo a context shift, reportative modal verbs do not.

7.1.8 Summary

In this section, it has been shown that reportative modal verbs and epistemic modal verbs differ with respect to the environments from which they are excluded. Generally speaking, reportative modal verbs are more flexible and less restricted. On the one side, there are environments in which epistemic modal verbs are totally ruled out and in which reportative modal verbs are

²⁵DeReKo: WPD/PPP.03963 Wikipedia, 2005.

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attested such as (i) adverbial infinitives, (ii) past participles that are embedded by a past tense auxiliary, (iii) nominalisations and (iv) optatives. On the other side, there are environments, in which reportative modal verbs yield a different interpretation than epistemic modal verbs such as (v) past tense contexts, (vi) questions and (vii) antecedents of conditional clauses.

Furthermore, it has turned out that reportative *wollen* and *sollen* do not behave in a uniform manner. As it seems, *wollen* is more flexible than *sollen*. This results in the following hierarchy of flexibility:

- (29) reportative *wollen* > reportative *sollen* > other epistemic modal verbs

How can the different behaviour of these verbs be accounted for? Evidently, these differences are due to procedures of how the variable of the deictic centre is instantiated. As far reportative modal verbs are concerned, the variable of the deictic centre is anchored to an argument referent that is introduced by the modal verb itself: in the case of reportative *wollen*, the deictic centre is linked to the overt subject argument, in the case of reportative *sollen*, it is linked to a covert argument which is contextually identified. As it appears, this process of identification is subject to further restrictions which could explain why reportative *sollen* is less readily acceptable compared to reportative *wollen*. The saliency of the deictic centre appears to be important at this point. Crucially, the variable is bound in a very local domain.

Turning to epistemic modal verbs, the variable of the deictic centre can be either linked to the speaker, to the addressee or to another referent. As it appears, there are very strict conditions which have to be met in order to identify the deictic centre. In the most canonical case, the variable for the deictic centre introduced by the epistemic modal operator is bound over a large domain. This means in turn, the variable remains open for a long time. There are good reasons to assume that there are certain operators such as circumstantial modal operators or certain tense operators which do not tolerate open variables of this type in their domain. Accordingly, all verbs that introduce variables that are bound at a local level such as reportative modal verbs can occur embedded under such operators. In contrast, verbs that introduce variables that cannot be identified in the scope of that operator and that are otherwise left open are not acceptable in such contexts.

Apart from the diagnostics discussed here, there are more statements about reportative modal verbs in non-canonical environments. On the one hand, there are authors such as Öhlschläger (1989, 236) who stresses the differences between reportative modal verbs and epistemic modal verbs. As he argues, reportative are more readily acceptable in event-related causal *weil*-clauses and in patterns in which they receive the nuclear stress. On the other hand, there are authors such as Ehrich (2001, 167) who are dedicated to the environments from which reportative modal verbs are excluded such as the scope of a negation.

7.2 So-called Evidentials *drohen*, *versprechen* and *scheinen*

As it has been shown in Section 4.2.11 and 4.2.12, the raising verbs *scheinen*, *dünken* on the one hand and *drohen*, *versprechen* and *verheißen* differ from the traditional modal verbs in essential respects, regardless of what has been claimed in earlier literature. The empirical data revealed in the last years refutes in particular the hypothesis advocated by Askedal, (1997b; 1998, 61)

or Wurmbrand (2001, 205) according to which these raising verbs constitute a uniform class together with epistemic modal verbs.

In the following Section, it will be demonstrated that the raising variants of these verbs differ significantly with respect to the non-canonical environments from which epistemic modal verbs are banned.

In particular, these raising verbs are attested in contexts in which epistemic modal verbs have proven to be unacceptable: (i) they can be embedded as past participles under past tense auxiliaries. Moreover, (ii) they are frequently attested in antecedents of event related conditionals. Apart from that, (iii) there are contexts in which these raising verbs yield an interpretation which differs from the one of canonical epistemic modal verbs, such as in past tense contexts.

In what follows, the three frequent verbs *scheinen*, *drohen* and *versprechen* will only be considered. Thus, the more archaic patterns *dünken* and *verheißen* will be ignored.

7.2.1 Past Participles

As it has been shown in Section 6.2, the use of epistemic modal verbs as past participles are fairly restricted. Basically, such uses can only be found embedded by present tense auxiliaries that are inflected for subjunctive of the past. In canonical present perfect tense or past perfect tense contexts, epistemic modal verbs cannot occur in German. Likewise, Askedal (1997b, 14), Fagan (2001, 220 Fn. 34) and Wurmbrand (2001, 205) claim that the raising uses of *drohen* and *versprechen* are banned from non-finite environments.

As illustrated by Reis (2005b, 133; 2007, 38) and Colomo (2011, 260ff.), the past participle of the raising pattern of *drohen* is well attested in German. The participle *gedroht* can be found in four different environments: (a) present perfect indicative (30)–(32), (b) present perfect subjunctive of the present (33), (c) past perfect indicative (34)–(40), (d) past perfect subjunctive of the past (41). In contrast, epistemic modal verbs are only attested in environment (d), which represents the least important context for *gedroht*, which mainly occurs in past perfect contexts.

- (30) Der zweitägige Volksentscheid in Rumänien über eine neue EU-gemäße
the two.day referendum in Romania about a new EU-conform
Verfassung hat an einer zu geringen Beteiligung zu scheitern gedroht.²⁶
constitution has at a to small participation to fail-INF threaten-PPP
'The two-day referendum in Romania about a new EU-conform constitution was about to
fail because of a participation that was too small.'
- (31) Wegen eines Lecks im Schiffsrumpf hat im Main-Donau-Kanal an der
due a leak in.the body has in.the Main.Donau-Channel at the
Schleuse Hilpoltstein (Landkreis Roth) ein Tankfrachter zu sinken
water.gate Hilpoltstein (administrative.district Roth) a tank.ship to sink
gedroht.²⁷
threaten-PPP

²⁶DeReKo: RHZ03/OKT.14345 Rhein-Zeitung, 20.10. 2003.

²⁷DeReKo: NUN09/FEB.02429 Nürnberger Nachrichten, 21.02. 2009.

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‘Due to a leak in the body, a tank ship was about to sink in the Main-Donau-Channel at the water gate Hilpoltstein (administrative district Roth).’

- (32) Die spanischen Erpressungsversuche, die in letzter Minute den Beitritt zu the Spanish extortion.attempts REL.PRN in the last minute the to verzögern gedroht haben, zeigen, wie unfertig diese Union ist.²⁸
procrastinate threaten-PPP have illustrates how incomplete this Union is
‘The Spanish attempts to extort which almost happened to procrastinate the entry in the last minute almost illustrate how incomplete this Union is.’
- (33) Die Frau habe mit den Armen gezappelt und umzukippen gedroht.²⁹
the woman has-SBJV.PRS with the arms fidget-PPP and to.fall-INF threaten-PPP
‘The woman had fidgeted with the arms and was about to fall.’
- (34) und so schied ich mit günstigem Wind von dem Ufer, welches mir and so departed I with beneficial wind from the shore which me lästrygonisch zu werden gedroht hatte.³⁰
laestrygonic to become threaten-PPP hatte
‘and so I departed from the shore that was about to become laestrygonic to me, supported by beneficial wind.’
- (35) Dabei hatte das Gewitter am späten Nachmittag die Veranstaltung schon actually had the thunderstorm on.the late afternoon the event already zu vereiteln gedroht.³¹
to thwart-INF threaten-PPP
‘Actually, the thunderstorm on the late afternoon was already about to thwart the event.’
- (36) Am 28. Mai hatten die Hochwasserdämme des an der Ortschaft on.the 28th May had the flood.dykes the-GEN at the locality vorbeifließenden Mains nach heftigen Regenfällen zu brechen gedroht.³²
bypassing Main-GEN after strong rainfall to burst-INF threaten-PPP
‘On 28th of May, the flood dykes of the Main that bypasses the locality were about to burst.’
- (37) Somit endete ein Spiel für die Berner in euphorischem Jubel, das zu einem so ended a game for the Bernese in euphoric exultation that to a weiteren Ärgernis der noch jungen Saison zu werden gedroht further annoyance the-GEN still young saison to become-INF threaten-PPP hatte.³³
had
‘And so ended the game for the Bernese with euphoric exultation that was about to become another annoyance in this still very young season.’

²⁸DeReKo: P94/DEZ.42489 Die Presse, 24.12. 1994.

²⁹DeReKo: BRZ08/DEZ.10451 Braunschweiger Zeitung, 19.12. 2008.

³⁰DeReKo: GOE/AGI.00000 Goethe: Italienische Reise, [Autobiographie], (Geschr. 1813–1816), In: Goethes Werke, Bd. 11. – München, 1982 [p. 35].

³¹DeReKo: R97/JUL.54255 Frankfurter Rundschau, 15.07. 1997.

³²DeReKo: NUN06/SEP.01329 Nürnberger Nachrichten, 12.09. 2006.

³³DeReKo: SOZ07/JUL.04839 Die Südostschweiz, 26.07. 2007.

7.2 So-called Evidentials *drohen*, *versprechen* and *scheinen*

- (38) Nachdem er unter Martin Andermatt zu versauern gedroht hatte, blühte
 after he under Martin Andermatt to INF threaten-PPP had blossomed
 er zuletzt unter dem neuen Chef Petkovic auf.³⁴
 he recently under the new boss Petkovic out
 ‘After he was about to waste away under Martin Andermatt, he recently blossomed under the
 new boss Petkovic.’
- (39) Direktor Karl-Heinz Waibel erinnerte an die von Raiffeisen spontan
 director Karl-Heinz Waibel reminded at the from the Raiffeisen
 bereitgestellte 1 Mill. S zur Bewerbung des Frühjahrsskilaufs,
 spontaneously 1 million Shilling to advertisement the-GEN spring.skiing-GEN
 nachdem Schnee- und Lawinenchaos die Gäste abzuschrecken gedroht
 after snow and avalanche.chaos the visitors to.off.frighten-INF threaten-PPP
 hatten.³⁵
 had
 ‘Director Karl-Heinz Waibel reminded about the Million Shilling provided by Raiffeisen for
 the promotion of the spring skiing project after the snow and avalanche chaos was about to
 frighten off the visitors.’
- (40) Das Bauvorhaben hatte sogar komplett zu platzen gedroht.³⁶
 the building.project had even completely to fail-INF threaten-PPP
 ‘The building project was even about to entirely fail at some point.’
- (41) Die Schließung sei notwendig geworden, weil es aggressive,
 the closing-down is-SBJV.PRS necessary become-PPP because it aggressive,
 lautstarke und mit Alkohol verbundene Aktivitäten auswärtiger
 loud and with alcohol combined activity from.outside-GEN
 Jugendlicher gegeben habe, die aus dem Ruder zu laufen
 adolescents-GEN give-PPP have-SBJV.PRS REL.PRN out the rule to run-INF
 gedroht hätten.³⁷
 threaten-PPP have-SJBV.PST
 ‘Reportedly, the closing down became necessary because of aggressive, loud activities in
 combination with alcohol caused by adolescents from outside that were about to get out of
 control otherwise.’

There are a couple of circumstances that deserve a closer consideration. Firstly, the great majority of the occurrences involve the past perfect tense. Secondly, the infinitive complement is very often realised by the verb *werden* ‘become’. Thirdly, most of the examples which have been found in the corpus study stem from Switzerland, Austria or Southern Germany.

As has already been shown in Section 4.2.12, the raising pattern of *versprechen* occurs significantly more rarely than the one of *drohen*. Moreover, it is almost restricted to infinitive complements that are realised by *werden*. Yet, there are a few instances of past participle *versprochen*

³⁴DeReKo: SOZ08/OKT.00350 Die Südostschweiz, 02.10. 2008.

³⁵DeReKo: V99/MAI.22846 Vorarlberger Nachrichten, 12.05. 1999.

³⁶DeReKo: NUZ09/SEP.02880 Nürnberger Zeitung, 30.09. 2009.

³⁷DeReKo: BRZ08/FEB.13559 Braunschweiger Zeitung, 26.02. 2008.

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used as a raising verb, as is illustrated in (42)–(43). Once again, the preferred configuration is the past perfect tense.

- (42) Was ein sehenswertes Derby der Handball-Landesliga zu werden
 what a worth.seeing derby the-GEN hand.ball.regional.league to become-INF
 versprochen hatte, verkam in den Augen manches Zeugen zur Lachnummer.³⁸
 promise-PPP had became in the eyes some-GEN witness to.a laughingstock
 ‘What promised to become an exciting derby in the regional league of hand ball turned for
 many witnesses into a laughingstock.’
- (43) Was am Samstag noch ein veritables Verkehrschaos zu werden versprochen
 what on Saturday still a true traffic.chaos to become-INF promise-PPP
 hatte und als solches auch vermeldet worden war, stellte sich Sonntag und
 had and as such also announced PASS.AUX was put on Sunday and
 Montag als halb so schlimm dar.³⁹
 Monday as half so bad there
 ‘What had promised to become a real traffic chaos on Saturday and what was also announced
 as such, turned out to be not as bad on Sunday and Monday.’

As Reis (2005b, 133; 2007, 38) observes, the past participle is possible with the raising verbs *drohen* and *versprechen*, but it is not attested with the raising verb *scheinen*. As she argues, none of the three forms come into consideration: neither the regular form of past participle *gescheint*, the irregular one *geschienen*, nor the IPP pattern *scheinen*.

Even if Reis’ claims are well supported for Contemporary German, it merits closer attention that the raising verb *scheinen* could be used as a past participle in earlier stages of German. As illustrated below, the participle *geschienen* was in use as a raising verb in the 18th and 19th century. This form occurs in different configurations: in perfect tense indicative (50), in perfect tense subjunctive of the present (44), in past perfect tense indicative (49). Apart from that, Lessing frequently uses *geschienen* with an ellipsis of the tense auxiliary (46)–(48). Of course, in these examples it is doubtful to what extent *geschienen* can still be considered as a genuine past participle.

- (44) Voltaire sagte, Frélon werde in der englischen Urschrift am Ende
 Voltaire said Frélon PASS.AUX.SJBV.PRS in the English original at.the end
 bestraft; aber so verdient diese Bestrafung sei, so habe sie
 punished but so deserved this punishment be-SBJV.PRS so have-SBJV.PRS she
 ihm doch dem Hauptinteresse zu schaden geschienen; er habe sie also
 him yet the main.interest to harm-INF seem-PPP he have-SBJV.PRS she thus
 weggelassen.⁴⁰
 omitted
 ‘Voltaire said Frélon was punished in the end in the English original. However, even if this
 punishment was justified it seemed to have harmed the main interest. Thus, he omitted it.’

³⁸DeReKo: RHZ00/NOV.20239 Rhein-Zeitung, 28.11. 2000.

³⁹DeReKo: P92/JAN.00445 Die Presse, 07.01. 1992.

⁴⁰Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p. 96, (1767).

- (45) Seitdem die Neuberin, sub auspiciis Sr. Magnifizenz des Herrn Prof. Gottscheds, den Harlekin öffentlich von ihrem Theater verbannte, haben alle deutsche Bühnen, denen daran gelegen war, regelmäßig zu heißen, dieser Verbannung beizutreten geschienen. Ich sage, geschienen; denn im Grunde hatten sie nur das bunte Jäckchen und den Namen abgeschafft, aber den Narren behalten.⁴¹
 since the Neuberin sub auspiciis his magnificence the-GEN Sir Prof. Gottsched-GEN the harlequin publicly from her theatre banned have all German stages REL.PRN there.on lied was regularly to be.called-INF this ban to.join-INF seem-PPP I say seemed because in.the reason had they only the colourful jacket and the name abolish-PPP but the fool keep-PPP
 ‘Since the Neuberin sub auspiciis of His Magnificence Sir Prof. Gottsched has publicly banned the harlequin from her theatre, all the German stage that wanted to be considered as conform with the rules seemed to have joined this ban. I say ‘seemed’ because basically they have only abolished the colourful jacket and the name, but the have kept the fool.’
- (46) er muß sich gedulden, bis es der Ausgang lehre, daß er da seiner Königin am getreuesten gewesen sei, als er es am wenigsten zu sein geschienen.⁴²
 he must REFL be.patient-INF until it the outcome teach-SBJV.PRS that he there his Queen at.the faithful-SUP be-PPP be-SBJV.PRS when he it at.the least to be-INF seem-PPP
 ‘He must be patient until it becomes clear that he was most faithful to his Queen when he seemed to be it the least.’
- (47) Bis auf den Augenblick, da er den Antenor ersticht, nimmt er an den Verbrechen seines Herrn auf die entschlossenste Weise teil; und wenn er einmal Reue zu empfinden geschienen, so hatte er sie doch sogleich wieder unterdrückt.⁴³
 until of the instant where he the Antenor stabs takes he at the crimes his-GEN master-GEN at the resolute-SUP manner part and when he once remorse to feel-INF seem-PPP so had he she yet immediately again suppressed
 ‘Until the moment when he stabs Antenor, he resolutely participates at the crimes of his master and when he seemed to feel remorse once in a while he had immediately suppressed it.’
- (48) Wenn wir also die Schönheiten dieser Figur durch und durch untersuchen, so werden wir mit Grunde urteilen, daß das, was man bisher für unbeschreiblich will we with reason judge that this what one up.to.now for indescribably

⁴¹ Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p. 138, (1768).

⁴² Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, II, p.74, (1768).

⁴³ Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p.148, (1767).

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vortrefflich an ihrem allgemeinen Anblicke gehalten, von dem hergerühret hat,
excellent at their general view considered from this arose has
was ein Fehler in einem Teile derselben zu sein geschienen.⁴⁴
what a mistake in a part the.same-GEN to be-INF seem-PPP

'If we investigate the beauty of this figure over and over, we will conclude that what was considered as indescribably excellent arose from that which seemed to be a flaw in the part of this figure.'

- (49) Schon in den Grundzügen der romantischen Erfindung erkannte ich den
already in the foundations the-GEN romantic-GEN concept recognised I the
Dichter nicht wieder, der bis dahin allen Dingen eine erheiternde Seite
poet NEG more the until then all things a exhilarating side
abzusehen gewußt, mit dem Mysticismus des Christentums sich
to.off.see-INF know-PPP with the mysticism the-GEN Christianity-GEN REFL
nie befaßt, überhaupt zur religiösen Poesie weder Anlage noch Neigung
never occupy-PPP even to.the religious poetry neither talent nor affinity
zu haben geschienen hatte.⁴⁵
to have-INF seem-PPP had

'Already in the foundations of the romantic concept I could not recognise the poet who until then knew to see an exhilarating side in all things who never occupied himself with the mysticism of Christianity and who seemed to have no talent or affinity to religious poetry.'

- (50) Ich hoffe nicht, daß Fritsche aus seiner sehr knauserigen Oekonomie auch diesen
I hope NEG that Fritsche of his very parsimonious economy also this
zurückbehalten hat. Hat er das, so habe ich freilich bisher Unrecht zu haben
kept had had he this so have I of.course so.far wrong to have-INF
geschienen⁴⁶
seem-PPP

'I do not hope that Fritsche kept it due to his parsimonious economy. If he had so, I seemed to have been wrong, of course.'

7.2.2 Event related conditional clauses

As shown in Section 6.17, epistemic modal verbs are subject to restriction with respect to their acceptability in antecedents of event related conditional clauses. This behaviour is obviously due to the necessity to identify the variable for the deictic centre within a given context. The identification of the open variable underlies a couple of strict conditions. Accordingly, the sentence will be ungrammatical if these conditions are not fulfilled and the variable remains unbound.

In contrast to epistemic modal verbs, the raising verb *drohen* can be used in antecedents of event related conditional clauses without any restrictions, as illustrated in the examples (51)–(53) given below. In all these examples, it is possible to substitute the subordinator *wenn* by

⁴⁴Gotthold Ephraim Lessing, *Laokoon: oder über die Grenzen der Mahlerey und Poesie*, p. 230, (1766).

⁴⁵Ernst Schulze, *Cäcilie*, I, preface, p. XII (1818).

⁴⁶Moritz Weinhold, *Achtundvierzig Briefe von Johann Gottlieb Fichte und seinen Verwandten*, p. 19, (1862).

7.2 So-called Evidentials *drohen*, *versprechen* and *scheinen*

falls. This ensures that the *wenn*-clauses under investigation are really event related conditional clauses, rather than generic temporal clauses.

- (51) Darin wird auch festgehalten, was passiert, wenn die Firma ihre Ziele nicht erreicht oder das Unternehmen sogar zu scheitern droht.⁴⁷
in.this is also recorded what happens if the company her goals NEG reaches or the company even to fail-INF threatens
'In this document, it is also specified what will happen if the company does not accomplish its goals or if the company threatens to fail.'
- (52) Unterstützung erhielt der Nachwuchs von erfahrenen Feuerwehrmännern, aber nur dann, wenn etwas schief zu laufen drohte, wie etwa bei der Fahrzeugtechnik.⁴⁸
support got the offspring by experienced fire.men but only then if something bad to go-INF threatened as for.instance at the automotive.engineering
'The offspring was supported by experienced fire men only if something threatened to turn bad, as, for instance, regarding the automotive engineering.'
- (53) Wenn jemand plötzlich im Wasser Probleme bekommt und zu ertrinken droht, kommen sie und helfen.⁴⁹
if somebody suddenly in.the water problems gets and to drown-INF threatens come they and help
'If somebody runs into problems while being in the water and threatened with drowning, they will come and help.'

Moreover, the raising verb *drohen* abundantly occurs in generic temporal *wenn*-clause which is another environment which is hardly compatible with epistemic modal verbs.

Likewise, raising patterns of *versprechen* are attested in the antecedent of event related conditionals. Again, the conjunction *wenn* can neatly be replaced by *falls* which clearly indicates that the examples below are really event related conditional clauses, rather than generic temporal *wenn*-clauses.

- (54) Man werde nur dann zukaufen, wenn dies profitabel zu werden verspreche.⁵⁰
one will-SBJV.PRS only then back.buy if this lucrative to become-INF promise-SBJV.PRS
'As it is said, they will only buy it back if this business promises to be lucrative.'
- (55) Wo man singt, da lass Dich nieder, sagt ein Sprichwort, und diesem folgt
where one sings there let you down says a saying and this follows

⁴⁷DeReKo: M07/OKT.05535 Mannheimer Morgen, 24.10. 2007.

⁴⁸DeReKo: RHZ06/OKT.28361 Rhein-Zeitung, 30.10. 2006.

⁴⁹DeReKo: BRZ09/OKT.08437 Braunschweiger Zeitung, 19.10. 2009.

⁵⁰DeReKo: HAZ08/MAR.02647 Hannoversche Allgemeine, 13.03. 2008.

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denn auch jung und alt gerne; zumal dann, wenn die Nächte sommerlich
then also young and old willingly especially then when the nights summerly
warm zu werden versprechen.⁵¹
warm to become- promise

'A saying says, "where they sing, there you shall settle down" which old and young people obey willingly, specially if the nights promise to become summerly warm.'

Finally, the raising patterns of *scheinen* can also be found in antecedents of event related conditional clauses, as it is exemplified in (56)–(57).

(56) Wenn er Fähigkeiten zu haben scheint, die man sich nicht erklären kann,
if he abilities to have seems REL.PRN one REFL NEG explain can
dann nennen wir ihn einen Zauberer oder Magier.⁵²
then call we him a sorcerer or magician
'If he seems to have abilities that cannot be accounted for, we call him a sorcerer or magician.'

(57) Wenn es einem aber vor allem darum zu gehen scheint, fragwürdige
if it one yet above all about.that to go-INF seem questionable
Entscheidungen der SPD-Landesregierung zu rechtfertigen, dann schreibt
decisions the-GEN SPD.regional.government to justify then writes
man in seinem Leserbrief natürlich etwas anderes.⁵³
one in his letter.to.the.editor of.course something else
'If it appears to be only about that to justify questionable decisions of the regional government led by the SPD, than you will write something else in your letter to the editor.'

Aside from event related conditional clauses, the three raising verbs *drohen*, *versprechen* and *scheinen* are also abundantly attested in generic temporal *wenn*-clauses, which is another related environment from which epistemic modal verbs are excluded. These facts clearly indicate that these raising verbs significantly differ from epistemic modal verbs.

At this point the question arises, why these raising verbs are acceptable in event related conditional clauses whereas epistemic modal verbs are not. As it has been illustrated above, epistemic modal verbs introduce a variable for the deictic centre which has to be anchored to an appropriate attitude holder. This process of identification underlies strict conditions. If these conditions are not fulfilled, the variable remains unbound and the linguistic structure cannot be interpreted. As it has been shown, the antecedents of event related conditional clauses are environments in which these conditions are difficult to meet for epistemic modal verbs. Evidently, *drohen*, *versprechen* and *scheinen* differ with respect to the nature of the deictic centre and how it is identified.

Turning to *drohen* and *versprechen*, Reis (2005b, 140; 2007, 18) has pointed out a whole range of essential analogies which they share with aspectual verbs. Accordingly, she suggests to consider the two raising verbs as aspectual verbs. In Section 4.2.12, more arguments in favour of such an analysis have been presented. If *drohen* and *versprechen* are considered as aspectual

⁵¹DeReKo: A98/JUN.36812 St. Galler Tagblatt, 04.06. 1998.

⁵²DeReKo: BRZ07/NOV.01811 Braunschweiger Zeitung, 15.11. 2007.

⁵³DeReKo: RHZ09/OKT.09156 Rhein-Zeitung, 10.10. 2009.

verbs, the necessity to assume a deictic centre decreases. Assuming that these lack such a deictic centre, there is no variable which needs to be bound and, correspondingly, they are not subject to the conditions of variable binding.

As far as *scheinen* is concerned, the situation is different. As it has been demonstrated in Section 4.2.11, *scheinen* can optionally realise its deictic centre as a dative NP. Accordingly, it is plausible to assume that the deictic centre is always represented as an argument of the raising verb, even if it is not overtly realised. As it appears, this argument position is usually filled with a generic pronoun which refers to a contextually given group of persons or the totality of all human beings. Apart from that, any analysis which treats *scheinen* as an epistemic modal verb ignores one important detail: it can alternatively select hypothetical comparative clause. Thus, it appears to be more appropriate to consider *scheinen* as a verb that compares two state of affairs. The one which the speaker is considering and the one to which it resembles. In other words: the state of affairs under consideration exhibits the same characteristics as the characteristics of the state of affairs expressed by the embedded proposition.

7.2.3 Past Tense

As it has been observed by Reis (2005b, 129; 2007, 13) and Colomo (2011, 241ff.), the raising pattern of *drohen* and *versprechen* behave in a very different manner compared to epistemic modal verbs when they are inflected for the past tense. As Reis argues, the past tense of the raising verb *drohen* does not convey ‘a report of speaker inferences on the basis of present knowledge but an objective report of a past event’. This indicates that *drohen* and *versprechen* are not to the same extent evaluated with respect to the speaker’s knowledge as epistemic modal verbs are.

In a similar manner, *scheinen* is attested in past tense context in which it does not undergo a context shift which is typical to epistemic modal verbs in such an environment, as it has been demonstrated at length in Section 6.3.

- (58) Mozart schien das Leben in Italien zu genießen.⁵⁴
 Mozart seem-PST the life in Italy to enjoy-INF
 ‘Mozart seemed to enjoy the life in Italy.’
- (59) Mozart [...] schien sich in Mailand so wohl zu fühlen, daß er seiner
 Mozart seem-PST REFL in Milan so well to feel-INF that he his
 Schwester mitteilte, daß er ‘keine lust mehr auf salzburg habe’.⁵⁵
 sister told that he no desire anymore on Salzburg have-SBJV.PRS
 ‘Mozart seemed to feel so well in Milan that he told his sister that he did not feel like going
 back to Salzburg.’
- (60) Allerdings schien Mozarts Vater auch vom neuen Plan nicht wirklich
 however seem-PST Mozart-GEN father also by.the new plan NEG truly
 überzeugt zu sein.⁵⁶
 convince-PPP to be-INF

⁵⁴Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 66, (2005).

⁵⁵Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 111, (2005).

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‘However, Mozart’s father did not seem to be very convinced about the new plan.’

- (61) Berufliche Angelegenheiten schienen den Vater in dieser Situation freilich
professional affairs seem-PST the father in this situation of.course
nicht zu interessieren.⁵⁷
NEG to interest-INF

‘Of course, the father did not seem to be interested in business in this situation’

- (62) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr Gefallen
the longer Leopold-GEN stay in Vienna lasted the more pleasure
schien er an diesem Leben zu finden.⁵⁸
seem-PST he an that live to find-INF

‘The longer Leopold’s stay continued, the more he seemed to like this sort of life.’

The examples (58)–(62) are particularly revealing regarding the nature of the evaluation at work in the case of *scheinen* because they involve an author who talks about a period in which he did not live yet. Accordingly, the past tense form *schien* in (58) does not reflect an assumption of the author which has been made when Mozart was in Italy. As a consequence, it does not yield a *past speech event* reading or a reported indirect speech interpretation, which is the natural interpretation for epistemic modal verbs in this context.

Alternatively, one could assume that *schien* reflects an assumption of Mozart’s contemporaries. But also such an interpretation is not the adequate one. At this point, the question arises what the precise contribution of the past tense marker exactly is in these contexts. It appears to be similar to the *past event reading*, an assumption undertaken by the speaker at utterance time based on some evidence from the past. It is not clear how such an analysis can look like in more detail.

Based on the hypothesis that *scheinen* is a verb which compares between two state of affairs, an attractive solution can be found. If the main contribution of *scheinen* is the expression of a comparison between two state of affairs, it is expected that the past tense operator would indicate that one of the two state of affairs ceased to exist. Accordingly, the example (58) could be rephrased in the following way: There was a state of affairs which was similar to the hypothetical state of affairs in which Mozart liked the life in Italy. Moreover, the referent who can perceive the comparison can optionally be encoded by a dative NP.

In German, it is possible to employ *scheinen* with respect to past events or states in two different ways. The past can be expressed as past tense morpheme on the verb *scheinen*, as is illustrated above. Moreover, the infinitive complement can be realised as perfect tense infinitive, as illustrated below. Although the meaning of these two alternatives seems to overlap, they are by no means synonymous. As demonstrated in (64), there are even contexts in which the past tense form *schien* cannot be substituted by a present tense form *scheint* which embeds a perfect tense infinitive. Interestingly, a replacement is significantly more acceptable with epistemic modal verbs which are evaluated in utterance time (65)–(67):

⁵⁶Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 118 (2005).

⁵⁷Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 218, (2005).

⁵⁸Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 274, (2005).

- (63) Mozart scheint das Leben in Italien genossen zu haben.
Mozart seem the live in Italy enjoy-PPP to have-INF
'Mozart seems to have enjoyed the life in Italy.'
- (64) # Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr Gefallen scheint
the longer Leopold-GEN stay in Vienna lasted the more pleasure seem
er an diesem Leben gefunden zu haben.
he an that live find-PPP to have-INF
'The longer Leopold's stay continued, the more he seemed to like this sort of life.'
- (65) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr Gefallen dürfte
the longer Leopold-GEN stay in Vienna lasted the more pleasure might
er an diesem Leben gefunden haben.
he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he seemed to have liked this sort of life.'
- (66) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr Gefallen könnte
the longer Leopold-GEN stay in Vienna lasted the more pleasure could
er an diesem Leben gefunden haben.
he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he could have liked this sort of life.'
- (67) ? Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr Gefallen muss
the longer Leopold-GEN stay in Vienna lasted the more pleasure must
er an diesem Leben gefunden haben.
he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he must have liked this sort of life.'

These contrasts follow naturally if *scheinen* is analysed as verb that establishes a comparison between a given state of affairs and a hypothetical state of affairs.

7.2.4 Summary

As this section has briefly demonstrated, the raising verbs *scheinen*, *drohen* and *versprechen* behave differently from epistemic modal verbs. There are a couple of environments in which they occur and in which epistemic modal verbs are categorically ruled out such as past participles which are embedded by indicative perfect tense auxiliaries or event related conditional clauses. Besides from that, there are environments in which these raising verbs yield interpretations in which they differ from genuine epistemic modal verbs, such as in past tense contexts.

From this it follows that *drohen*, *versprechen* and *scheinen* cannot be analysed as epistemic modal verbs, as it is advocated by Askedal (1997b, 14, 1998, 61) and Wurmbrand (2001, 205). Alternatively, there are good arguments to treat *drohen* and *versprechen* as aspectual verbs, as it has been suggested by Reis (2005b, 140; 2007, 18). In contrast, *scheinen* is most efficiently captured as a verb that establishes a comparison between a given state of affairs and a hypothetical state of affairs. The referents who can perceive this comparison can optionally be realised as a dative NP. As a consequence, *scheinen*, *drohen* and *versprechen* will not receive any further consideration in the upcoming sections.

8 Anchoring the deictic centre

In the preceding sections, it has been shown that epistemic modal verbs are excluded from a whole range of environments: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisations, (iv) they are exempt from adverbial infinitives, finally, they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. In contrast, reportative modal verbs are attested in some of these environments: in nominalisations (iii), in adverbial infinitives (iv), embedded under tense auxiliaries (v), optative operators (viii).

Moreover, it has been demonstrated that there are environments in which epistemic modal verbs and reportative modal verbs obtain different interpretations. In most of these environments, reportative modal verbs do not undergo a context shift such as in past tense contexts, in questions and in antecedents of event related conditionals.

The aim of the following section is to provide an explanation for the following observations.

1. Why are epistemic modal verbs excluded from these environments?
2. Why are reportative modal verbs nevertheless possible in certain of these environments?
3. Why do the two types of modal verbs differ in their interpretations in certain contexts?
4. Why do reportative *wollen* and reportative *sollen* have different preferences for these environments?

As it turns out, these all modal operators introduce can be characterised as operators which introduce a variable for the deictic centre. In order to apply the Condition for Deictic Centres (CoDeC), this variable needs to be instantiated. This operation of identification needs to fulfil certain anchoring conditions. If these conditions are not met, the variable remains unbound. As it appears, there are particular contexts that do not tolerate an unbound variable of the deictic centre.

8.1 The speaker, the addressee and arguments

As it is obvious, epistemic modal verbs are evaluated with respect to a certain attitude holder. In the most frequent case, this is the speaker. Yet, there are contexts in which the epistemic modal verb is evaluated with respect to a referent different from the speaker. Accordingly, the epistemic operator must be some sort of variable which identifies the attitude holder who makes a commitment to a certain believe.

8.1.1 Declarative speech acts

In their most frequent use, epistemic modal verbs are part of a declarative speech act. There is a widely spread consensus that the epistemic modal verb is evaluated with respect to the speaker's knowledge in these configurations.

- (1) So kann die Motte in Wipshausen einmal ausgesehen haben.¹
so can the Motte in Wipshausen once out.look-INF have-INF
'The Motte in Wipshausen could have looked like this once upon the time.'
- (2) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich um einen Mann
the clothes indicate then also to.it at that it REFL about a man
gehandelt haben müsste.²
deal-PPP have-INF must-SBJV.PST
'The clothes indicate that it must have obviously been a man.'
- (3) Der Wunsch nach Ungestörtheit dürfte schließlich dem Liebespaar auf so
the wish for privacy might finally the love.couple for such
tragische Weise das Leben gekostet haben.³
tragic manner the live cost-PPP have-INF
'The wish for privacy might have finally caused the death of the lovers, who died in such a tragic manner.'

In all of the representative examples given above, the attitude holder who undertakes the epistemic assumption is identified with the speaker. Thus, the speaker indicates that the embedded proposition is not part of his own knowledge.

8.1.2 Interrogative speech acts

Much rarer, there are epistemic modal verbs that occur in information seeking questions. As it has been illustrated in great detail in Section 6.11 and 6.12, the epistemic modal is not evaluated with respect to the speaker. Rather, the attitude holder who carries the believe is identified with the addressee.

- (4) a. MOPO: Wer könnte die Fälschung der Wahl veranlasst haben?
who could the fraud the-GEN election arranged have
b. Steinbach: Nur einer: Revolutionsführer Ajatollah Ali Chamenei.⁴
only one revolution.leader Ajatollah Ali Chamenei
'Who could have arranged the fraudulent elections?'
'Only one, the leader of the revolution Ajatollah Ali Chamenei.'

¹DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11.08. 2009.

²DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29.06. 2009.

³DeReKo: NON09/JAN.04467 Niederösterreichische Nachrichten, 12.01. 2009.

⁴DeReKo: HMP09/JUN.01442 Hamburger Morgenpost, 17.06. 2009.

A speaker which uses an epistemic modal verb in an information seeking question indicates that he does not expect that the addressee has enough knowledge to commit himself to a precise answer. Rather, the speaker asks the addressee about his assumptions. Accordingly, the speaker does not attribute the embedded proposition to the addressee's knowledge. It has been illustrated in Section 6.11 and 6.12 that question operators are operators that induce a general type of context shift in which the addressee becomes the most salient referent.

8.1.3 Complement clauses

As it has been shown in Section 6.15, the epistemic modal verb is not evaluated with respect to the speaker. Based on the observations made by Lasersohn (2005, 277), Stephenson (2007, 489) argues that an embedded epistemic modal verb is always evaluated with respect to an attitude holder argument of the immediately super-ordinate predicate. Likewise, Zimmermann (2004, 265) argues that related epistemic modifiers such as the discourse particle *wohl* may never take scope out of a complement clause.

- (5) Und er erzählt, dass dieses Rätsel bald gelöst sein könnte.⁵
And he tells that this riddle soon solv-PPP be-INF could
'And he said that this riddle could be solved soon.'
- (6) Polizeisprecher Thomas Figge erklärte gestern auf Anfrage, dass der
police.spokesman Thomas Figge declared yesterday on demand that the
33-Jährige mindestens Tempo 100 gefahren sein muss.⁶
33.year.old at.least tempo 100 drive-PPP be-INF must
'The police spokesman Thomas Figge declared yesterday, on demand, that the 33 year old
must have driven at least 100 km/h.'

In both examples, the epistemic modal verb is embedded under a predicate which involves a subject referent which can be interpreted as an attitude holder. Accordingly, the variable of deictic centre provided by the epistemic modal verb is anchored to the subject referent *er* 'he' in example (5) and to the subject referent police spokesman *Thomas Figge* in example (6). In the examples above, the speaker signals that he does not attribute the embedded proposition to the knowledge of the respective subject referents.

8.1.4 Reportative modal verbs

As it has been demonstrated in Section 4.2.3 and Section 4.2.6, reportative modal verbs attribute a claim to one of their arguments. In the case of *wollen*, the claim is associated with the subject argument referent (7) and, in the case of *sollen*, the claim is associated with a covert argument which is contextually identified (8).

⁵DeReKo: NUN03/AUG.02519 Nürnberger Nachrichten, 28.08. 2003.

⁶DeReKo: BRZ09/MAI.05146 Braunschweiger Zeitung, 12.05. 2009.

8 Anchoring the deictic centre

- (7) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die hagere Gestalt
Badhapur is a Sadhu, a sage righteous 106 years wants the rawboned figure
mit dem langen grauen Haar schon alt sein.⁷
with the long grey hair already old be-INF

‘Badhapur is a Sadhu, a wise and righteous man. This rawboned figure with long grey hair claims to be 106 years old already.’

- (8) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl. F.) soll
Tom Cruise and Katie Holmes are shocked L R Hubbard small picture shall
Suris Vater sein.⁸
Suri-GEN father be-INF

‘Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri’s father.’

In the examples above, there appear to be two referents that come into consideration to be the deictic centre: Firstly, the deictic centre could be the speaker. Secondly, the deictic centre could be the attitude holder argument of *wollen* and *sollen*. As will be demonstrated in the next section, there are good reasons to adopt the latter type of analysis. According to this approach, the speaker indicates that he has no evidence whether the embedded proposition is really part of the verified knowledge of the EXPERIENCER argument. In example (7), he would convey that he does not know whether the proposition *Sadhu is 106 year old* is really part of Sadhu’s verified knowledge. Alternatively, it could be a false belief or Sadhu could be lying. In neither of the two case, the speaker would consider the proposition as Sadhu’s knowledge. In example (8), the speaker signals that he has no reason to assume that the proposition *L. R. Hubbard is Suri’s father* is really part of the covert argument referent’s knowledge. This will be shown in great detail in Section 8.2.2.

Summary

In this section, it has been demonstrated that epistemic modal operators are not always evaluated with respect to the speaker. There are particular contexts and configurations in which the operator is interpreted with respect to other referents: in information seeking questions, the relevant referent is the addressee; in embedded context, the epistemic agent is realised as an attitude holder argument of the super-ordinate clause. Finally, the operator is evaluated with respect to an argument of the modal verb in the case of reportative modal verbs. These facts reveal the nature of the syntactic and semantic representation of that attitude holder. As it can refer to different referents, it needs to be some sort of variable. In what follows, this variable will be referred to as the deictic centre. The ensuing sections are dedicated to the conditions which govern the instantiation of that variable.

⁷DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23.10. 1999.

⁸DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08.01. 2008.

8.2 The deictic centre

As it has been illustrated above, epistemic modal operators introduce a variable with respect to which they need to be evaluated. A similar concept has been introduced by Charles Fillmore (in the reprinted version: Fillmore (1997, 98)) in his *Lectures on Deixis* in the early seventies, in which he discusses the *deictic centre* for the first time. Subsequently, it has been elaborated in more detail by Levinson (1983, 64). A similar notion has already been developed by Bühler (1934, 102) who refers to it as *Origo*. Abraham (2011, xxxv) illustrates that the notion *Origo* is a potential mean for the description of epistemic modality. Even if the *deictic centre* is a concept that affects a lot of linguistic elements, this section will uniquely be addressed to its role for epistemic modal operators.

There are further reasons that make it plausible to assume that epistemic modal verbs introduce a variable for the deictic centre. Firstly, there is an independent need to assume that any modal operator specifies a modal source. As it will be shown in Section 8.2.1, this modal source is identical to the deictic centre in the case of epistemic modal verbs. Secondly, it has been illustrated throughout this study that epistemic modal verbs are characterised as operators that are evaluated with respect to the knowledge of someone. In particular, their use indicates that the speaker does not know whether the embedded proposition really holds. How this can be formulated in more precise terms will be pointed out in Section 8.2.2.

8.2.1 The modal source

Necessities and possibilities are often considered as abstract forces. Accordingly, the modal source is the source of these forces. As for circumstantial modal verbs, this modal source is typically instantiated by the individual who imposes the obligation in the case of *müssen* 'must', who grants the permission in the case of *dürfen*, to whom the volition is attributed in the case of *wollen* and *sollen*. An influential description of the modal source has been provided by Bech (1949, 4). He argues that, sometimes, the modal source is already specified in the lexicon entry. As Bech (1949, 37) exemplifies, *wollen* and *sollen* need to be analysed as necessity modal verbs. Accordingly, *wollen* and *sollen* can be considered as necessity modal verbs which specify their modal source as [+internal]. In contrast, there are other necessity modal verbs such as *müssen* which remain underspecified with respect to the modal source. Diewald (1999, 102) has shown that the modal source is always realised by the speaker in the case of epistemic modal verbs. In other words, the speaker is the referent who judges the embedded proposition with respect to its validity and who makes a commitment to the truth. In opposition, the discourse referent who makes the commitment to the truth in the case of reportative modal verbs is the referent encoded by the EXPERIENCER argument, as it has been observed Diewald (1999, 225).

Interestingly, the modal source has not received much consideration in the most popular approaches in formal semantics such as Kratzer (1981), Kratzer (1991), Brennan (1993) or Hacquard (2006). In one of the most prominent approaches on modality, Kratzer (1991, 649) assumes modal operators involve three relevant dimensions of modality: the modal force, the modal base and the ordering source. Yet, the modal source does not appear to play any crucial role in this account.

But since the past decade, there is a growing number of studies which have illustrated the

necessity of the concept modal source. In his formal semantic analysis, Westmoreland (1998, 74) illustrates that an epistemic operator has always to be evaluated with respect to a given person. Likewise, Abraham (2005, 263) argues that both circumstantial and epistemic modal verbs involve a modal source which is represented as a covert argument of the modal verb. In a similar fashion, Depraetere and Verhulst (2008, 3) demonstrates that each type of necessity has its source of modality, including epistemic necessities. Furthermore, Lasersohn (2005) indicates that predicates of personal taste have to be evaluated with respect to a judge, which is most typically instantiated by the speaker. Extending his analysis to epistemic modal verbs, Stephenson (2007, 497) shows that epistemic modal verbs also have to be evaluated with respect to some judge.

8.2.2 The Condition on Deictic Centres

Through out this study, it has been shown that the most efficient way to characterise epistemic modality is in terms of knowledge. A speaker which employs an epistemic modal verb indicates that he does not know whether the embedded proposition is true. This condition has been referred to as the *Condition on Deictic Centres (CoDeC)*. The next section is dedicated to issue as to how it can be formulated in an exact way. The section after that will illustrate how the CoDeC can be applied to reportative modal verbs.

Which propositions are not part of the knowledge?

In principle, there are three ways to formulate the CoDeC. The open question is which propositions are exactly not part of the deictic centre's knowledge. Is it only the positive proposition (9a)? Is it rather the negated proposition (9b)? Or have both of them to be excluded from the deictic centre's knowledge (9c)?

- (9) Three ways to formulate the CoDeC:
- a. p is not part of the deictic centre's knowledge
 - b. $\neg p$ is not part of the deictic centre's knowledge
 - c. neither p nor $\neg p$ part of the deictic centre's knowledge

As it appears, there are advocates for each of the three positions. As most of the authors are not very explicit about this matter, it is not always clear whether the classifications given below really reflect their intention. Nevertheless, they can roughly be associated with one of the three options. The first position, according to which the positive proposition is only excluded (9a) appears to be defended by Krämer (2005, 60, 133) and Ziegeler (2006, 90). A compatible account has been elaborated by Diewald (1999, 207) who claims that, in the case of epistemic modal verbs, the deictic centre values the embedded proposition as [\pm non-factive]. In a less explicit way, Erb (2001, 161), Fintel and Gillies (2010, 353), Kratzer (2011) argue for an fairly similar analysis based on the concept of direct evidence rather than knowledge. The second position, according to which the negated proposition is only excluded, (9b) is explicitly advocated by Martin (2011, Sec. 3.1.), who explicitly claims that a speaker which employs an epistemic modal verb 'is not sure in EVAL-T that P is false'. Finally, the third position according to which both propositions

are excluded (9c) appears to be entertained by Westmoreland (1998, 12), though he does not make any explicit claim about this matter.

As there are configurations in which the speaker knows the embedded proposition to be false, the alternatives (9b) and (9c) are less plausible. It has been shown in much detail in Section 4.2.1, 4.2.2, 4.2.6 and 6.4 that epistemic modal verbs can be combined with false proposition if they are inflected for the subjunctive of the past. In particular, this affects the three forms *könnte*, *müsste* and *sollte*. A representative example is given below (10):

- (10) Wenn alle Meldungen über Schwangerschaften der Oscar-Preisträgerin
 if all reports about pregnancies the-GEN oscar-winner
 gestimmt hätten, müsste sie mittlerweile 30 Babys bekommen
 attune-PPP have-SBJV.PST must-SBJV.PST she meanwhile 30 babies get-PPP
 haben. Kidman ist Mutter zweier adoptierter Kinder.⁹
 have-INF. Kidman is mother two-GEN adopted-GEN children
 ‘If all those reports about the Oscar winner’s pregnancies had been true, then she would be supposed to have 30 babies by now. Kidman is mother of two children that she has adopted.’

As this instance clearly points out, the author of that utterance knows that Nicole Kidman has not 30 children. Of course, one could argue that this peculiar behaviour is the effect of the subjunctive of the past form. But an appropriate analysis remains to be developed.

The second position, according to which the negated proposition is only excluded, (9b) is the least plausible one. Apart from the difficulties just mentioned, it cannot account for the fact that an epistemic modal verb hardly ever embeds a proposition which is known to be true. The first option has the great advantage to capture subjunctive of the past modals as well without any further stipulations. And as it will be shown in the following sections, it is able to capture the behaviour of reportative modal verbs as well.

At this point, it is possible to formulate the *Condition for Deictic Centres* as it is suggested below:

- (11) Condition on Deictic Centres (CoDeC)
 The use of an epistemic operator indicates that the embedded proposition is not part of the deictic centre’s knowledge.

This conditions neatly captures the behaviour of epistemic modal verbs in declarative clauses, in questions and in embedded complement clauses. In the following section, it will be demonstrated that it is also capable of accounting for the behaviour of reportative modal verbs.

The deictic centre in reportative modal verbs

As it has been indicated above, reportative modal verbs crucially differ from epistemic modal verbs with respect to the deictic centre because they involve two different potential candidates which come into consideration for the deictic centre: the speaker and the referent encoded by the EXPERIENCER argument provided by the reportative modal verb.

⁹DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31.12. 2007.

8 Anchoring the deictic centre

By means of the diagnostics presented in the previous section, it will become more evident which of the two candidates acts as the deictic centre for reportative modal verbs. Once again, the relevant aspect concerns the knowledge of the referents. Granted that the CoDeC as it is formulated above, two hypotheses will be examined: (i) the use of a reportative modal verb implies that *p* is not part of the speaker's knowledge and (ii) the use of a reportative modal verb implies that *p* is not part of the EXPERIENCER's knowledge. Hypothesis (i) is refuted in case reportative modal verbs occur in contexts in which *p* is part of the speaker's knowledge, hypothesis (ii) is refuted in case reportative modal verbs occur in contexts in which *p* is part of the knowledge attributed to the referent encoded by the EXPERIENCER argument.

First of all, Ehrich (2001, 157), Colomo (2011, 241), Faller (2011, 4) and Faller (2012, 289) have pointed out that reportative modal verbs can embed propositions which the speaker knows to be false. Such configurations are attested in corpora, as is illustrated in (12)–(14). In this respect, reportative modal verbs differ from epistemic modal verbs that are inflected for the indicative.

- (12) Die Familie des angeblichen Verlobten weiß nichts von einer Tania Head.
the family the-GEN alleged fiancé knows nothing about a Tania Head
Die Bank Merrill Lynch, bei der sie gearbeitet haben will, hatte sie
the bank Merrill Lynch at REL.PRN she work-PPP have-INF wants had her
nie auf der Gehaltsliste.¹⁰
never on the payroll
'The family of her alleged fiancé has never heard about Tania Head. At Merrill Lynch, where she claims to have worked, she was never on the payroll.'
- (13) Es war nicht korrekt, diesen Druck auf den angeklagten Kindermörder
it was NEG correct that pressure on the accused child.murderer
auszuüben. Aber dass sich dieser Strolch vor dem Polizei-Vize-Chef
to.exert-INF but that REFL that thug of the police-vice-boss
,„gefürchtet“ haben soll, ist Schauspielerei.¹¹
afraid.be-PPP have-INF shall is comedy
'It was not correct to exert pressure on the accused child murderer. But he is a comedian if the thug claims to have been "afraid" of the vice-boss of the police.'
- (14) bei mir in der Firma soll angeblich ein Paket bei mir abgegeben
at my in the company shall reportedly a parcel at me deliver-PPP
worden sein.... Stimmt nicht. Ich habe das Paket nie gesehen.¹²
PASS.AUX-PPP be-INF holds NEG I have the parcel never seen
'Reportedly, a parcel was delivered to me at my company Not true. I have never seen the parcel.'

These instances reflect situations in which the speaker knows the embedded proposition to be false and in which the knowledge of the referent expressed by the EXPERIENCER argument

¹⁰As quoted in Colomo (2011, 241): DeReKo: HAZ07/OKT.00069 Hannoversche Allgemeine, 01.10.2007.

¹¹As quoted in Colomo (2011, 241): DeReKo: RHZ04/DEZ.17444 Rhein-Zeitung, 18.12.2004.

¹²As quoted in Faller (2012, 289): Urbia.de forum post, <http://www.urbia.de/archiv/forum/th-3614401/Unterschrift-gefaelscht-Paket-verschwunden-Und-nun.html>, last accessed 25/7/2012.

is left unspecified. This referent could be know the embedded proposition to be false, thus he would be lying. Alternatively, he could also have a false belief and being convinced that the embedded proposition is true. As a consequence, the effect of the reportative modal verb is to label the commitment of that referent as unreliable. In a similar manner, Diewald (1999, 228) suggests that reportative *wollen* occurs even more often in environments in which the speaker raises doubt about the validity of the embedded proposition. An analogous reasoning is advocated by Öhlschläger (1989, 235). Even if the examples (12)–(14) are in slight favour of hypothesis (ii), according to which the relevant knowledge is the one associated with the EXPERIENCER argument, they do not refute hypothesis (i).

The hypothesis (i) is only refuted if there are contexts in which the embedded proposition is really part of the speaker's knowledge. As illustrated by the discourse given in (15), such cases exist. Assume that the speaker is a doctor who talks about a hypochondriac patient.

- (15) a. Der Schani ist ein alter Hypochonder, andauernd kommt er mit anderen
the Schani is a old hypochonder always comes he with other
Geschichten daher.
stories along
- b. Stell Dir vor, jetzt will_{quot} er Malaria haben.
imagine you PART now want he malaria have-INF
- c. Und soll ich dir was sagen? Er hat wirklich Malaria, ich habe gerade
And shall I you something say he has indeed Malaria I have just
die Blutproben vom Labor zurückbekommen.
the blood.test from.the laboratory back.get-PPP
- 'Schani is an old hypochondriac. Each time he comes to see me, he tells a different story. Imagine, he now **claims** to have malaria. But would you believe, I've just got back his blood test results from the laboratory and it says that he indeed has malaria.'

This example describes a context in which the referent encoded by the EXPERIENCER argument makes a non verified claim about himself. Crucially, the proposition *I have Malaria* is not part of his knowledge, either he does not know whether it holds or he has a false belief. In opposition, the speaker knows that this referent has indeed Malaria. Arguably, the context given in (15) could alternatively be interpreted in a way that the referent encoded by the EXPERIENCER argument already knew beforehand that he had malaria because he had already made another blood test at another hospital. This seems to refute hypothesis (ii). However, this context deserves a closer look. Even if it turns out that the referent encoded by the EXPERIENCER argument indeed already knew that he had malaria, the use of the reportative modal verb in (15) contributes some resonance of doubt. How can this be accounted for? It is important to distinguish between what this referent really knows and what knowledge the speaker attributes to that referent. As it turns out, the latter type of knowledge is only relevant to the interpretation of reportative modal operators. In employing a reportative modal verb, the speaker expresses that he has no compelling evidence that the modified proposition *p* is indeed part of the referent's knowledge. In some cases, he could have even explicitly known that *p* is not part of the referent's knowledge. However, up to now, there are no examples of reportative modal operators attested in which the speaker knows that the modified proposition is true and part of the knowledge that

is attributed to the referent encoded by the EXPERIENCER argument. Moreover, in such a context, a reportative modal operator would be redundant. As it seems then, a speaker who employs a reportative modal verb expresses that he does not attribute the modified proposition *p* to the knowledge of the referent encoded by the EXPERIENCER argument. Reportative modal operators reflect the perspective of the speaker rather than the objective truth. This explains why the speaker considers the information conveyed by reportatively modified propositions as not reliable even in contexts in which it later turns out that the referent encoded by the EXPERIENCER argument did indeed know that the proposition was true. Accordingly, the acceptability of reportative modal operators does not hinge on whether the referent encoded by the EXPERIENCER argument knows that he has malaria. Rather, the use of a reportative modal operator signals that the speaker does not attribute the modified proposition to the knowledge of the referent encoded by the EXPERIENCER argument.

Faller (2012, 289) provides an authentic example taken from the web. Just like with (15), example (16) exhibits a configurations in which the speaker knows the proposition to be true. Regarding the knowledge of the referent expressed by the EXPERIENCER, it is left unspecified: even if the option in which the uncle is lying is not very likely, it is nevertheless not excluded. In any case, the speaker conveys a glimpse of doubt whether the uncle's conclusion is well grounded on reliable evidence or if it is true by chance.

- (16) Die Standzeit soll sehr hoch sein laut Onkels Aussage und die Äste
 the service.life shall very high be-INF according Uncle's report and the branches
 werden überhaupt nicht gequetscht, habe ich auch selbst gesehen.¹³
 are at.all NEG crushed have I also myself seen
 'The service life is, according to Uncle's report, very high and the branches are not crushed
 at all, I have also seen it myself.'

However, it is necessary to remark that the validity of Faller's example is not beyond doubt. The phrase *habe ich auch selbst gesehen* could also refer to the second conjunct (*die Äste werden überhaupt nicht gequetscht*), which does not contain any reportative modal verb. According to this configuration, the embedded proposition would not automatically be knowledge of the speaker. Yet, the interpretation suggested by Faller is possible, even if it was not intended by the speaker.

Examples like (15) and (16) demonstrate two things: firstly, reportative modal verbs are compatible with situations in which the speaker knows that the embedded proposition is true. In such a context, the speaker signals that he does not know whether the proposition is really also part of the referent's knowledge or whether this referent lies, has a false belief or utters a proposition without having any evidence for its truth. Secondly, the speaker does not ascribe the embedded proposition to the knowledge of the referent encoded by the EXPERIENCER argument.

As a consequence, these observations are clearly in favour of hypothesis (ii). Thus, reportative modal verbs differ from their epistemic cognates in two important respects. Whereas, in the case of reportative modal verbs, it is the referent encoded by the EXPERIENCER argument which is committed to the truth of the embedded proposition, it is the speaker in the case of epistemic

¹³As quoted in Faller (2012, 289): Werkzeug-News.de forum post, <http://www.werkzeug-news.de/Forum/viewtopic.php?p=147095>, last accessed 25/7/2012.

modal verbs. Furthermore, the use of an epistemic modal verb signals that the embedded proposition is not part of the speaker's knowledge. In contrast, the use of reportative modal verbs indicates that the embedded proposition is not part of the knowledge ascribed to the referent expressed by the EXPERIENCER argument.

Even if the CoDeC can be applied to the reportative modal verbs, this does not entail that it makes the right prediction for all modifiers that are related to epistemic modal verbs which have been discussed in Chapter 5: as it turns out, they fail to capture the behaviour of relevance conditionals.

Summing up, the CoDeC can also be applied to reportative modal verbs. In this case, the deictic centre is instantiated by the referent expressed by the EXPERIENCER argument. Accordingly, reportative modal verbs are evaluated with respect to the knowledge of the referent encoded by the EXPERIENCER argument which is realised as the subject in the case of *wollen*, some other covert argument in the case of *sollen*.

8.3 A unified analysis for epistemic and reportative modality

As it was seen in the previous section, there are different referents with respect to which an epistemic operator can be evaluated. At this point, it still remains mysterious what precisely governs the identification of the deictic centre.

In the upcoming section, it will be demonstrated how deictic centres are anchored to appropriate referents. The identification is based on a *hierarchy of salience* which ranks the most likely candidates which come into consideration for the deictic centre, as it will be demonstrated in Section 8.3.1. This hierarchy turns out to be a powerful tool as it is not only capable of explaining the correct identification of the deictic centre, but it also accounts for the fact that epistemic modal verbs are excluded from the non-canonical environments and that reportative modal verbs can occur in some of these environments at the same time, as will be pointed out in Section 8.3.2.

8.3.1 Hierarchy of Salience

As it seems, the deictic centre of an epistemic operator is always anchored to the closest syntactically represented referent which can be interpreted as an attitude holder, whereas closeness is defined in terms of the syntactic clause hierarchy. Accordingly, the closest candidates are appropriate arguments which are introduced by the modal operator itself. Such configurations only exist with reportative modal verbs: whereas *wollen* involves an EXPERIENCER argument which is realised as subject, *sollen* involves a covert EXPERIENCER argument which is contextually supplied. The next candidates are appropriate arguments which are introduced by a predicate that embeds an epistemic modal verb. In the most typical case, these verbs are attitude predicates or predicates of communication. Finally, the last candidate is the most salient referent of the speech act which is the speaker in declarative clauses and the addressee in information seeking questions and conditionals. As there is always such a referent, epistemic modal verbs are by default evaluated with respect to the most salient referent of the speech act unless there is another appropriate candidate which occurs in a closer distance to the epistemic operator.

(17) Hierarchy of Saliency

1. the EXPERIENCER arguments of the predicate which introduce the epistemic modal operator
2. the EXPERIENCER argument of an attitude predicate in the super-ordinate clause
3. the most salient referent of the speech act

Regardless of which of these candidates, the epistemic modal operator will be anchored to, the CoDeC has to be applied. From this analysis it follows, despite their substantial differences reportative operators could be seen as epistemic operators which are already anchored at the level of the verb itself. Given these conditions of anchoring, it is finally possible to account for the incompatibility of epistemic modal verbs with the non-canonical environments discussed above.

8.3.2 Operators which impose selectional restrictions

As it has been illustrated in Chapter 6, epistemic modal verbs are excluded from eight environments: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisations, (iv) they are exempt from adverbial infinitives, finally, they cannot be (v) embedded under circumstantial modal and other auxiliary verbs, (vi) predicates of desire, (vii) imperative operators and (viii) optative operators. Regarding these contexts, the question arises what these configuration have in common.

At closer inspection, it turns out that the environments (iv)–(viii) involve some sort of circumstantial modal operator. Furthermore, this circumstantial modal operator bears scope over the epistemic modal operator. As it has been observed by many authors such as Cinque (1999, 87), Eide (2005, 9) or Colomo (2011, 111), the scope of a circumstantial modal operator is an environment from which epistemic modal operators are excluded. Based on the findings made in the previous sections, it is now possible to provide an explanation for this behaviour. Evidently, circumstantial operators are a type of operator which cannot embed unbound variables for the deictic centre:

- (18) Circumstantial modal operators fail to embed structures which contain an unbound variable for the deictic centre.

If this condition is right, it is expected that reportative modal verbs should be significantly more acceptable embedded under circumstantial modal operators. As it was seen in Section 7.1, they are attested in adverbial infinitives, embedded under auxiliaries, and in optatives.

The analysis developed above gains further support by the behaviour of epistemic *lassen*, which has been discovered by Reis (2001, 308). Interestingly, this pattern appears to be restricted to imperatives. As it has been demonstrated in Section 4.1.1 and 6.13, the traditional six modal verbs lack an imperative form, except for *wollen* which can rarely be found in such patterns if it is used without infinitive complement. According to the selectional restriction for circumstantial modal operators (18), it is expected that any epistemic operator that involves a bound variable for the deictic centre should be in principle acceptable in imperatives. As *lassen* has an independent imperative form and modal semantics, it provides an interesting case.

In case of epistemic *lassen*, the deictic centre is identified with the subject referent. As it is used as an imperative, the subject remains syntactically unrealised and it is identified with the addressee. If the CoDeC is correct, it is expected that the speaker does not attribute the embedded proposition *it costs 100,-* to the knowledge of the addressee. And indeed, this appears to be the case in (20).

- (19) A: Was kostet das Buch wohl?
 what costs the book maybe
- (20) B: Lass es mal 100,- kosten.
 let-IMP it PART 100 cost-INF
 A: ‘How much could the book be?’
 B: ‘Let it be 100,-/Assume that it costs 100,-.’

As predicted, the speaker expects that the embedded proposition is not part of the deictic centre’s knowledge. In these respect, *lassen* behaves just as canonical epistemic modal verbs do. In contrast, the deictic centre is realised as the subject argument of the epistemic modal verb in the case of *lassen*. As a consequence, the variable for the deictic centre is already instantiated within the scope of the imperative operator. As predicted by the analysis above, this results in a grammatical configuration.

In a similar vein, nominalisations could be regarded as an operation which only applies to verbs that contain no unbound variable for the deictic centre. This would neatly account for the fact that reportative modal verbs can be subject to nominalisation whereas epistemic modal verbs cannot.

There are only two of the non-canonical environments discussed in Chapter 6 which are not accounted for selectional restrictions of a super ordinate operator: (i) the fact that epistemic modal verbs cannot be separated from their infinitive complements in *wh*-clefts and (ii) their incompatibility with verbless directional complements. Neither of the cases can be accounted for in terms of anchoring of the deictic centre. Interestingly, these environments are equally unacceptable for reportative modal verbs. As it seems, the reason to their ungrammaticality is due to the selectional restrictions of the epistemic modal verb itself.

As it has been shown in Section 7.1.5, it appears to be possible under certain conditions to identify unbound variables of the deictic centre by a rule of accommodation, as it has been developed by Lewis (1979, 172) and Kratzer (1981, 61).

8.4 Alternative Analyses

There are other analyses which explain the restricted compatibility of epistemic modal verbs with environments discussed in Chapter 6. The most explicit accounts for German have been developed by Wurmbrand (2001, 182–204) and Erb (2001, 116–125), who argue that epistemic modal verbs have to be considered as auxiliaries which have lost all properties typical for the category verb. They exhibit an impoverished morphology and they cannot be used as non-finite form (infinitive, past participle) anymore. Both approaches follow Cinque’s (1999) cartographic tradition, assuming that the different types of modal verbs are merged as different functional

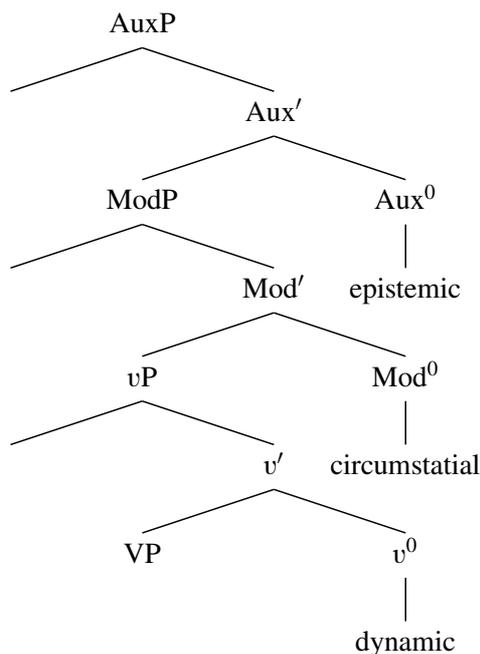


Figure 8.1: Wurmbrand (2001)

categories in the clausal hierarchy. In Wurmbrand's (2001, 183) analysis, epistemic modal verbs are merged in Aux^0 , circumstantial modal verbs with raising patterns in Mod^0 and circumstantial modal verbs with control patterns in v^0 , as is illustrated in Figure 8.1. Turning to Erb's (2001, 124) approach, she suggests that epistemic modal verbs are merged in a functional category for sentence mood M^0 , circumstantial modal verbs with raising structure in Mod^0 and circumstantial modal verbs with control structure in V^0 , as shown in Figure 8.2. In both analyses, modal verbs with control syntax are considered as lexical verbs, as they involve proper referential subject arguments.

In essence, Wurmbrand and Erb argue that epistemic modal verbs are functional elements rather than lexical verbs and accordingly they have lost the ability to occur in non-finite contexts. Askedal (1997b, 13; 1998, 60) has developed a similar perspective. Analogous approaches have been suggested for English, cf. Butler (2003) and Roberts (2003).

Unfortunately, these approaches face a whole range of serious challenges. Firstly, it has been demonstrated in Section 6.1 and Section 6.2 that epistemic modal verbs can occur in non-finite environments under certain conditions: if the matrix predicate involves an argument which can be interpreted as an attitude holder. The existence of non-finite occurrences of epistemic modal verbs cannot be explained under the assumption that epistemic modal verbs are not verbs but affix-like entities which are merged in functional projections for inflection or more abstract elements.

Secondly, it is not evident how these accounts treat reportative modal verbs. In particular, it is necessary to account for the parallel behaviour of reportative modal verbs and epistemic modal

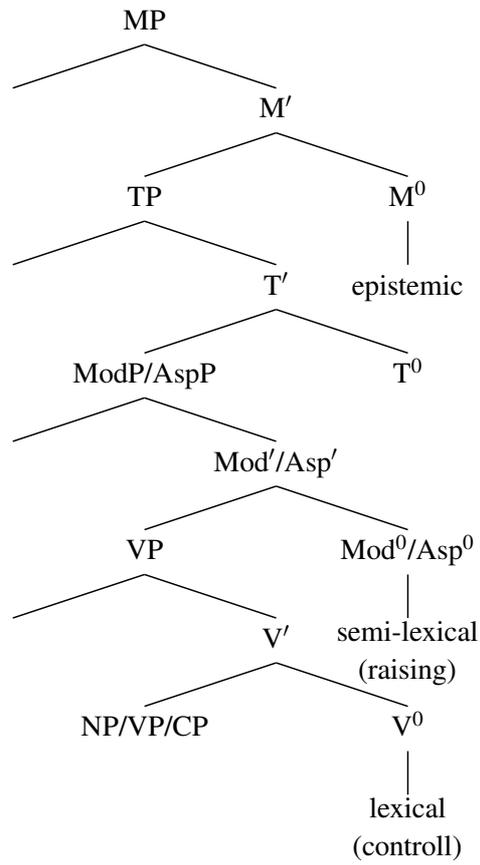


Figure 8.2: Erb (2001)

verbs. This concerns on the one hand their ability to embed predications between an identified individual and a predicate which refers to a state which is not likely to change or a predicate which refers to a past event. And on the other hand, their requirement to be anchored to some deictic centre. Given these properties, one could assume that reportative modal verbs are merged as a functional category which occupies a high position in the clausal hierarchy such as Aux^0 or M^0 . Yet, reportative modal verbs involve referential arguments: *wollen* selects an animate referential subject argument and *sollen* has an argument which is usually not overtly realised. Following the canonical assumption, higher functional projections do not contribute proper arguments. Accordingly, reportative modal verbs cannot be merged in the same functional projection as epistemic modal verbs. Alternatively, one could assume that reportative modal verbs are lexical categories and merged as V^0 or v^0 . In this case, the necessity of reportative modal verbs to be anchored to a deictic centre appears to be detached from the status of their category. Accordingly, variables for deictic centres could also be introduced by lexical categories. As a consequence, the question arises why epistemic modal verbs need to be functional categories at all.

Thirdly, it is not evident how these accounts could capture the fact that reportative modal verbs can be subject to nominalisation whereas their epistemic cognates fail to be. Moreover, these accounts even fail to explain why circumstantial modal verbs with raising structure can be nominalised, as nominalisation is traditionally considered as a operation which only applies to lexical categories but not to functional ones.

Fourthly, Wurmbrand's (2001, 183) and Erb's (2001) analyses cannot account for differences between reportative and epistemic modal verbs regarding non-finite environments. Whereas epistemic modal verbs are very restricted in this respect, reportative modal verbs can occur in a couple of contexts from which their epistemic counterpart are excluded such as in adverbial *ohne-zu* infinitives or embedded under auxiliaries. In general, it is not clear as to which extent these account are capable of capturing the differences between epistemic modal verbs and reportative modal verbs, as they have been described in Chapter 6 and Chapter 7.

Apart from that, cartographic approaches, as those presented here, are confronted with ordering paradoxes, as there are many more alternatives of combining modal verbs as these approaches would predict. This is discussed by Maché (2012, 132) in more detail.

Considering these challenges, it appears to be a more efficient solution to analyse all the different syntactic patterns of modal verbs as elements of the category verb. Reportative modal verbs and epistemic verbs are special in that they introduce a variable for a deictic centre which needs to be bound. Both types of verbs only differ with respect to the domain in which the deictic centre is actually instantiated.

8.5 Summary

In the previous section, it has been pointed out that the distributions of epistemic modal verbs and reportative modal verbs can be accounted for in terms of anchoring of the deictic centre. Epistemic modal operators introduce a variable for the deictic centre with respect to which they are evaluated. In order to be interpreted, this variable needs to be instantiated by an appropriate attitude holder. The instantiation of the deictic centre follows the Hierarchy of Salience accord-

ing to which the variable will be anchored to the closest appropriate argument which can be interpreted as an attitude holder. In the most canonical case, the variable will only be identified at the level of the speech act which results in configuration in which the deictic centre is anchored to the speaker.

Moreover, there are a whole range of contexts which do not tolerate unidentified variables. Circumstantial modal operators fail to embed linguistic structures which contain an open variable for a deictic centre. This explains the behaviour of epistemic modal verbs which are generally banned from the scope of a circumstantial modal operator. Furthermore, it has been shown that reportative modal operators can be considered as particular epistemic modal operators which introduce a variable for the deictic centre which is anchored to an argument of the modal operator itself. As a consequence, these variables introduced by reportative modal verbs are already instantiated at a very local level. In turn, this accounts for the fact that reportative modal verbs can occur in the scope of circumstantial modal operators as they do not contain any unbound variable. As it has been pointed out, nominalisation are another environment which is not compatible with unbound variables for the deictic centre. As a consequence, they do not apply to epistemic modal verbs whereas they do apply to reportative modal verbs. The behaviour of circumstantial modal operators and nominalisations could be captured in terms of selectional restrictions: these operators are restricted to linguistic structures which do not contain an open variable for the deictic centre.

From the facts discussed above it follows that, despite their substantial differences, reportative operators could be seen as epistemic operators which are already anchored at the level of the verb itself. Thus, neither epistemic modal verbs nor reportative modal verbs need to be regarded as functional categories. They can be neatly described as lexical verbs which are characterised by the fact that they introduce a variable for the deictic centre which needs to be bound according to a couple of given conditions.

9 On black magic – a diachronic explanation

Each syntactic pattern described in Section 4.2 corresponds to a different stage of grammaticalisation. Accordingly, the descriptions given in that section roughly reveal the historical development of each single verb. The grammaticalisation of epistemic modal verbs typically involves the steps indicated in (1). Similar approaches have been proposed by Lehmann (1995, 33) and Diewald (1999, 2, 34).

- (1) transitive verb \Rightarrow control verb with event modification \Rightarrow raising verb with event modification \Rightarrow epistemic verb.

For most of the verbs considered above, the path of development is slightly different or even more complex. An extensive description of an individual development has been given in Section 4.2.9, where *brauchen* is discussed, the youngest epistemic modal verb, which only grammaticalised in the 19th century. The following section will only address the last step of the grammaticalisation when circumstantial modifiers turn in to epistemic ones, as it has turned out in the previous chapters that the epistemic patterns are the most essential for the verbs under investigation here. As for the step from transitive verbs to verbs which select infinitive complement, the reader is referred to Paul (1920, 95) and Fritz (1997, 68), who argue that the bare infinitive complements have their origin in former accusative NPs.

As it has often been observed, it is fairly intricate to determine the precise interpretation of a given traditional modal verb. By means of the diagnostics developed in the Sections the Sections 4 to 8, the characteristics of circumstantial modal verbs and their epistemic modal counterparts were revealed. Moreover, it has been shown in which respect these two types of verbs differ. These differences are essential for the understanding of the diachronic development of modal verbs. Following the most prominent hypothesis advocated by Traugott (1989, 35), Sweetser (1990), Bybee et al. (1994, 195), Fritz (1997), Diewald (1999), Axel (2001, 45), epistemic modal verb have diachronically emerged from their circumstantial cognates.

In Section 9.1, a small corpus study on the behaviour of epistemic modal verbs from the 16th century will be presented. As it has been argued by Fritz (1991, 45), Fritz (1997, 94), Diewald (1999, 365), this is the crucial period in which the use of epistemic modal verbs became frequent in German. As it turns out, almost all of the epistemic modal verbs found in this corpus select stative predicates that refer to states that cannot be changed. In contrast, circumstantial modal verbs typically subcategorise infinitive complements that contain eventive predicates. Accordingly, there are good reasons to assume that the first epistemic modal verbs in history selected stative complements. A similar observation has already been made by Abraham (1991, 2001, 2005) and Leiss (2002).

In Section 9.2, an account will be provided which explains why the first epistemic modal verbs in history selected stative predicates. This approach is based a pragmatic rule of accommodation in the spirit of Lewis (1979, 172), which is considered as black magic by Kratzer (1981, 61).

9.1 Epistemic modal verbs in Early New High German

As it is known, polyfunctional modal verbs occurred in Germanic Language from Early Middle Age on. Krause (1997, 95) discusses a whole range of potentially epistemic modal verbs from Old High German. In most of the cases, the respective verb is *mugan*. Yet, as Axel (2001, 45 Fn. 31) has pointed out, the status of many of her examples is rather doubtful. At any rate, there are a few examples for *mugan* which are epistemic beyond doubt such as (2). Likewise, Denison (1993, 298) provides a range of instances from Old English. The most convincing examples involve the verb *magan*, as is illustrated in (3). This pattern is very similar to the German *Es kann sein* pattern which is almost always interpreted in an epistemic way, as it has been illustrated by Doitchinov (2001, 119) and in the examples (92)–(95) discussed in Section 4.2.1. Moreover, he discusses single occurrences of *sculan* and *willan*. Yet, their status appears to be less clear.

(2) Ther evangelio thar quit, theiz mohti wesan sexta zit¹
 the Gospel there says this may-SBJV.PST be-INF sixth hour
 ‘The Gospel says at this point that it might have been the sixth hour.’

(3) Swiþe eaþe þæt mæg beon þæt some men þencan...²
 very easily that may be-INF that some men think
 ‘It may very well be that some men think...’

As the data collected by Bolkestein (1980, 89–103, 123–133) shows, the ambiguity of related verbs has already been established in Latin: the necessity verbs *debere* ‘must’ and *oportet* ‘must’ could already alternatively be interpreted in a circumstantial and an epistemic manner. Accordingly, the development of ambiguous polyfunctional modal verbs in Germanic languages could be a result of language contact with Latin.

Yet, regarding for Western Germanic languages, epistemic modal verbs remain rare until the early 16th century. As Müller (2001, 244) has observed, there are only a few convincing occurrences of epistemic modal verbs in the Prose Lancelot, which was written in the 13th or 14th century. He discussed one example for epistemic *mögen* and one for reportative *sollen*. According to Müller (2001, 243), the scrutinised corpus contains 200.000 word form tokens. Likewise, Denison (1993, 298) has noticed that epistemic uses of modal verbs in English are only marginally developed in the Old and Middle English period. They are only systematically established in Early Modern English.

In a similar vein, Fritz (1991, 45), Fritz (1997, 94), Diewald (1999, 365) have demonstrated that epistemic modal verbs only became frequent in the course of the Early New High German period. According to these findings, the present study investigates Ulrich Schmid’s *Neuwe Welt*

¹*Otfrid* II, 14, 9–10 (around 870), as quoted in Krause (1997, 95), translated by JM.

²The Blickling Homilies 21.17 (around 980), as quoted in Denison (1993, 299).

published in 1567, which is a travelogue of Portuguese discoverers travelling to India.³ The underlying corpus encompasses the preface plus the first chapter, which comprise in total 44,687 word form tokens.

Regarding the genre, it should be seen more as a narrative text rather than as a journalistic report. The latter would rely on different sources or even just rumours, and in order to be objective it would evaluate them with regard to the preconceived convictions of the author. This is fairly different from a travelogue, which is normally founded on only one source of evidence: the sensory input and the immediate experience of the author himself.

In contrast to the investigation undertaken by Müller (2001, 244), there are at least seven unambiguously epistemic modal verbs among 44.000 word form tokens. The frequency of epistemic modal verbs in *Neuwe Welt* appears to be considerably higher than in the *Prose Lancelot*. As already in previous stages of Western Germanic languages, the verb which is most frequently attested with an epistemic interpretation is *mo^egen* (5 times), followed by *ko^ennen* (1) and *mu^essen* (1). As already with Old High German example (2) provided by Krause (1997, 95), an epistemic reading appears to become more likely if the respective verb is specified for the subjunctive of the past. Only two occurrences are inflected for the indicative present (4)–(5), one for the indicative past (6) whereas four occurrences exhibit the subjunctive of the past (7)–(10). This shows that the subjunctive of the past facilitates an epistemic interpretation.

- (4) Vnnd erstlich gibt er jhm sechtzig Kanons an gold / das ist ein Mu^entz die also
and first gives he him sixty Kanons of gold that is a coin that alike
heist / vnd mag zusammen drey Portugalesischer Croisaden seyn / das
be.called and may altogether three Portuguese Croisades be-INF that
were dreissig Ducaten.⁴
be-SBJV.PST thirty ducats
'At first he gives him sixty golden Kanons, that so-called coin might value about thirty Portuguese Croisades or thirty ducats.' (epistemic)
- (5) Vnd welches er nach dieser sach geda^echte / das were vrsach gnug /
and which he after this incident think-PST this be-SBJV.PST reason enough
wie vil er jetzundt vielleicht auff vns halten mag / das er vns hernach auch
how much he now maybe about us think-INF may that he us then also
verachtet.⁵
disdains
'And the thoughts which he had after this incident were reason enough that he would disdain us even afterwards – whatever he may think about us now.' (epistemic)
- (6) Vnd wie er im wenden war / da vernam er sieben oder acht Blut Schiffe / die
and as he at veer-INF was there noticed he seven or eight blood ships the
jm aus der Inseln mit auffgezogenen Segel nachfuhren / vnnd mochten von
him from the islands with hoisted sails followed and may-PST from

³I am grateful to Christiane Wanzeck who provided me with a hard copy of the original print from 1567.

⁴Ulrich Schmid, *Neuwe Welt*, p. 19b, (1567).

⁵Ulrich Schmid, *Neuwe Welt*, p. 21b, (1567).

9 *On black magic – a diachronic explanation*

des Nicolas de Cocillo schiff ein grosse meil wegs weit seyn.⁶
 the-GEN Nicolas de Cocillo ship a large mile way-GEN away be-INF
 ‘And as he was about to veer, he noticed seven or eight blood ships that followed him from the island with hoisted sails and they may have been about one large mile away from the Nicolas de Cocillo’s ship.’ (epistemic)

(7) Des Sontags / vngefährlich vmb Vesper zeit / kamen die vnsern bey drey
 the-GEN sunday-GEN about at vespers time came the ours by three
 Inseln / die alle sehr klein waren / vnd mo^echte eine von den andern
 islands the all very small were and may-SBJV.PST one from the others
 vielleicht vier meil weit seyn.⁷
 maybe four miles away be-INF
 ‘They arrived on sunday with vespers at three islands that were all very small and that might have been away four miles from each other.’ (epistemic)

(8) Es mo^echte wol seyn / daß sie etwan ein wenig auß dem weg
 it may-SBJV.PST well be-INF that she eventually a little of the way
 gefahren weren / vnd darumb ka^emen sie in das wetter /
 travel-PPP be-SBJV.PST and therefore come-SBJV.PST they in the weather
 das regiert gewoehnlich vmb die zeit⁸
 REL.PRN reigns usually around the time
 ‘It may be that they eventually deviated a little bit from the course and therefore they were exposed to the weather which usually at that period.’ (epistemic)

(9) [...] hielte er dafu^er / es mu^este der Ko^enig auß Portugal ein dapfferer
 thought he that it must-SBJV.PST the king of Portugal a brave
 geherzter Mann seyn.⁹
 hearted man be-INF
 ‘He thought that the King of Portugal must be a bold and brave man.’ (epistemic)

(10) darab der Oberst sehr froh ward / denn er gedachte bey jhm selbst / dieweil
 about.that the colonel very happy got for he thought by him self because
 er zu Leuten kommen were / die etlicher massen Schiffung hetten / so
 he to people come be-SBJV.PST the many size navigation had thus
 ko^endte Indien nicht mehr weit seyn¹⁰
 can-SBJV.PST India NEG more far be-INF
 ‘Therefore the colonel became very happy, for he thought that since he came to people with the knowledge of navigation India could not be that far any more.’ (epistemic)

⁶Ulrich Schmid, *Neuwe Welt*, p. 7b, (1567).

⁷Ulrich Schmid, *Neuwe Welt*, p. 7b, (1567).

⁸Ulrich Schmid, *Neuwe Welt*, p. 36a, (1567).

⁹Ulrich Schmid, *Neuwe Welt*, p. 15a, (1567).

¹⁰Ulrich Schmid, *Neuwe Welt*, p. 7a, (1567).

circumstantial modal verb	complement	percentage
<i>mo^egen</i> (91)	<i>seyn</i> (3), Kimean (3; <i>wissen, leiden</i>)	6,59%
<i>ko^enmen</i> (154)	<i>seyn</i> (3), Kimean (4; <i>haben, wissen</i>)	4,55%
<i>mu^essen</i> (33)	<i>seyn</i> (3), Kimean (2; <i>haben</i>)	15,15%
<i>wollen</i> (307)	<i>seyn</i> (7), Kimean (7; <i>haben</i>)	4,56%
<i>sollen</i> (179)	<i>seyn</i> (9), Kimean (3; <i>freuen, halten, haben</i>)	6,70%
<i>du^erffen</i> (22)	<i>seyn</i> (1)	4,55%

Figure 9.1: Circumstantial modal verbs with stative complements – in Schmid’s *Neuwe Welt* (1567)

As illustrated in (5), the concessive epistemic interpretation of *mag* was already available in the 16th century. In the example provided above, it occurs in a clause which has to be analysed as a concessive conditional along the lines suggested by König and van der Auwera (1988, 118) as it is introduced by a free choice item *wie vil*. The epistemic interpretation of *mag* in the pattern above is even more plausible regarding the fact that Menedéz-Benito (2010, 33) has shown that free choice items have a affinity to occur with possibility modal operators which can also be epistemic.

Moreover, it deserves closer attention that six out of the seven epistemic modal verbs attested in this corpus occur in non-embedded main clauses. There is only one epistemic modal verb which occurs in an embedded clause (9). Yet, the respective complement clause lacks a subordinative conjunction and exhibits a V2 order, which is generally be hold as characteristic of non-integrated complement clauses, as it has been pointed out by Antomo and Steinbach (2010, 12) and others. Rather, it should be analysed as a clause which is adjoined to the matrix VP.

Apart from that, these epistemic modal verbs collected above share another essential characteristic. All of them select stative predicates as complements: most notably the copula *seyn* ‘be’, as illustrated in (4) and (6)–(10) or predicate of mental state *halten* ‘consider’, as indicated in (5). Many of them refer to a state which cannot be changed or are not likely to be changed.

In contrast, Maché (2008, 401) has shown that circumstantial modal verbs in Schmid’s *Neuwe Welt* occur by far less frequently with stative complements. The precise figures are illustrated in Figure 9.1. This is on a par with the observations made by Abraham (1991, 2001, 2005) and Leiss (2002), who have demonstrated that circumstantial modal verbs have a preference for predicates with an eventive semantics.

Aside from the unambiguous occurrences of epistemic modal verbs, the corpus contains roughly ten more instances of modal verbs which could be interpreted in an epistemic manner under certain conditions. Interestingly, they are characterised by a couple of preferences. As Maché (2008, 393) has already pointed out, all of these ambiguous occurrences select eventive predicates as complement. Furthermore, they mostly occur embedded under attitude predicates. Finally, these modal verbs typically bear past subjunctive morphology. Maché (2008, 390) has already suggested that the choice of the subjunctive of the past morphology could be triggered by the syntactic context. As he has illustrated, *mo^egen* occurs in embedded clauses in 76 out of 99 cases, in which it is mostly specified for the subjunctive of the past.

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In what follows, some of the ambiguous instances will gain closer inspection. The most likely interpretation of *mo^egen* in (11) is an ability reading. This corresponds to the manner in which it was used in Old High German. At this period, the verb was frequently employed to attribute an ability to the subject referent. Moreover, the modal verb is realised as a IPP participle which is embedded by a perfect tense auxiliary with subjunctive of the past morphology. This is an environment which is not likely to host epistemic operators.

- (11) Bontaibo verwunderte sich sehr / wie sie zu wasser hetten kommen
 Bontaibo wondered REFL very how they at water had come-INF
 mo^egen / uñ fragten jn was sie sucheten / weil sie so weit
 may-PPP(ipp) and asked him what they searched because they that far
 gefahren weren:¹¹
 travel were
 ‘Bontaibo was very surprised as to what had enabled them to come across the sea and asked them what they were looking for, since they were travelling so far.’

Furthermore, there are usages of *mo^egen* which are fairly likely to be interpreted in a circumstantial manner. Some of them are reminiscent of possibility modal verbs which quantify over situations, such the English verb *can* which is discussed in Section 5.2. In (12)–(15), the speaker expresses that he knows about the possibility that the state of affairs expressed by the proposition can happen, under certain conditions.

- (12) Denn der Hafē wer besser daselbst / denn zu Calecut / da die seit
 for the harbour be-SBJV.PST better there than at Calecut where the coast
 sehr gefehrlich ist / vnnd die Schiff mo^echten vielleicht daselbst verderben.¹²
 very dangerous is and the ship may-SBJV.PST maybe there perish-INF
 ‘For that harbour was better than the one at Calecut where the coast is that perilous that the ship could maybe get lost.’
- (13) denn er wuste nicht / was jme etwan begegnen mo^echte.¹³
 for he knew NEG REL.PRN him eventually happen-INF may-SBJV.PST
 ‘For he didn’t know what could (perhaps) happen to him.’
- (14) Auch solte er bedencken / wie es nach seinē todt jnen allen ergehen
 also shall-SBJV.PST he reflect how it after his death them all go-INF
 mo^echte.¹⁴
 may-SBJ.PST
 ‘Moreover he should imagine how their fate would be when he died.’

¹¹Ulrich Schmid, *Neuwe Welt*, p. 20a, (1567).

¹²Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

¹³Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

¹⁴Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

- (15) denn sie furchteten / es mo^echte jhnen begegnen was jhn S.
 for they feared it may-SBJV.PST them happen-INF REL.PRN them S.
 Helenen Hafen begegnet war¹⁵
 Helena port happen-PPP was
 'For they were afraid it could (possibly/presumably) happen to them the same that happened to them at port S. Helena.'

Summing up, most of the examples (11)–(15) are fairly likely to be interpreted in a circumstantial manner. As a consequence, those instances which involve unambiguously epistemic modal verbs behave in a fairly uniform manner: they all select some sort of stative predicate which, in many cases, refers to a state which is not likely to be changed.

Regarding the situation of modal verbs in Early New High German, it appears to be plausible that the first epistemic modal verbs in history originally selected stative predicates. The circumstantial modal verbs found in Ulrich Schmid's *Neuwe Welt* dominantly occur with eventive predicates as complements, which conforms to the hypothesis formulated above, according to which circumstantial modal verbs are event modifiers, as it is illustrated in Section 5.2. In opposition to that, epistemic modal verbs are frequently attested with stative predicates which refer to a state which is not likely to change. Accordingly, the grammaticalisation of modal verbs could be considered as a change from event modifiers into propositional (or speech act) modifiers. The following section will provide a detailed scenario as to how epistemic modifiers have most likely evolved.

9.2 The Rule of Accommodation as a driving factor of language change

At this point, it is important to notice that circumstantial modal verbs can occasionally be combined with typical stative predicates such as *sein* or *haben*. Likewise, epistemic modal verbs are not restricted to stative predicates but they can sometimes also select eventive predicates.

At first glance, it appears that these configurations are in conflict with the hypothesis outlined in Section 5.2, according to which circumstantial modal operators are event modifier – why should an event modifier modify a state? There are several authors such as Kratzer (1995, 148) and Maienborn (2003, 178, 193, 216) which have suggested that very abstract stative predicates can be transformed into more eventive predicates by means of pragmatic mechanisms. As they assume, there is a class of stative predicates (Individual Level Predicates in terms of Carlson (1977), Kratzer (1995) and Diesing (1992) or Kimean State Predicates in terms of Maienborn (2003)) which do not involve a Davidsonian event argument. Following their ideas, an event modifier should not modify such a stative predicate because it lacks an event argument. Correspondingly, a circumstantial modal verb is restricted to the modification of predicates which involve an event argument. If it selects a stative predicate such as *sein*, this would result in a configuration which violates the selectional restrictions imposed by the circumstantial modal.

As suggested by Lewis (1979, 172) and Kratzer (1981, 61), there is a way of providing the required type of complement if such is missing. This rule can be applied under certain

¹⁵Ulrich Schmid, *Neuwe Welt*, p. 5b, (1567).

circumstances and it is known as the Rule of Accommodation:

Rule of Accommodation

If the utterance of an expression requires a complement of a certain kind to be correct, and the context just before the utterance does not provide it, then *ceteris paribus* and within certain limits, a complement of the required kind comes into existence.

As Kratzer (1981, 61) remarks, this rule *is black magic, but it works in many cases*. So it does in the case of circumstantial modal operators. Maienborn (2003, 178, 193, 216) has elaborated two pragmatic mechanisms that can supply a stative predicate with an event argument if such is missing. In her reasoning, any Kimean state predicate lacks an event argument in the lexicon, as illustrated in Maienborn (2003, 106). Accordingly, these predicates refer per default to temporally unbound states. They can be confined if a specific event argument is supplied. This can be provided by the Temporariness Effect, which introduces temporal boundaries for the state, as exemplified in: *She was tired*. Moreover, the Agentivity Effect can turn a mere state into a volitionally controlled action, which is, in turn, temporally restricted: *Dafna is being polite*. In other words, any predicate which is selected by a circumstantial modal verb will be interpreted as predicate which refers to a temporally restricted state or event.

As it has been shown Section 4.2.1 and 5.3, there are contexts in which the communicative effect of an epistemic possibility verb is almost identical to the communicative effect of a circumstantial possibility verb. Correspondingly, it is a challenging endeavour for the addressee to guess which alternative the speaker has realised and intended.

Such a contexts is the typical situation in which a reanalysis applies. There are two possible alternatives: the operator under consideration could be either interpreted as a practical possibility verb supported by pragmatic repair mechanism or as an epistemic modal verb. As the latter does not require a pragmatic repair mechanism in order to be acceptable, it is less complex.

As it has been demonstrated by Lightfoot (1979, 375), Roberts and Roussou (1999, 1022) and Roberts (2003, 16) language learner tend to assume the least complex linguistic analysis for the input to which they are exposed. Accordingly, any language learner would prefer the analysis build on the epistemic modal verb rather than the analysis which involves a circumstantial modal verb which is combined with an illicit complement and an opaque repair mechanism.

At this point, the question arises what role the subjunctive of the past plays in this scenario. As it was seen, the majority of epistemic modal verbs in earlier stages of German seems to be specified for the past. It could be possibly an indicator of decreased commitment. In Section 4.2.1 and 4.2.2, it was demonstrated that the subjunctive of the past indicates on epistemic modal verbs that some of the premises on which the evaluation is based are not verified.

9.3 Summary

Of course, the analysis outlined here remains very sketchy. In near future, when large scale electronic corpora for historical data will be available, it will be possible to provide an analysis which is grounded on a stronger empirical support. This section indicates which direction is

fruitful to pursue for future research on grammaticalisation. The type of the embedded predicate appears to play a key role in the development of epistemic modal verbs. As shown throughout the study, circumstantial modal operators are most likely to be seen as event modifiers, while epistemic modal operators are operators which act on the clause level. Accordingly, the grammaticalisation of epistemic modality can be captured as a change from event modification to clausal modification. This confirms the observation made by Abraham (1991, 2001, 2005) and Leiss (2002), who argue that aspectual semantics of the embedded predicate play a crucial role in the grammaticalisation of epistemic modality. Moreover, it was demonstrated in Chapter 8, epistemic modal verbs can still be considered as elements of the category verb. Accordingly, the process of grammaticalisation here can be considered as development which does not affect the syntactic category of the underlying verb.

The essential clue for understanding this development is that circumstantial modal operators are capable of selecting stative predicates as long as they can be reinterpreted as events by means of a pragmatic repair mechanism. As long as language learner are able to detect this mechanism, the modal operators will be attributed a circumstantial interpretation. In some contexts, however, the communicative effect of a circumstantial modal operator and an epistemic one is almost identical. It can happen, that the application of the repair mechanism becomes to opaque for the language learner. As a consequence, he would prefer an epistemic interpretation which is the less complex alternative in this case.

10 Summary

This must be the end. Finally, all of the potential modal verbs in German have been discussed in great detail, considering the most important findings from several centuries of research and grounded on broad empirical data. The result is the first comprehensive corpus based description of the so-called modal verbs in German. The underlying corpus is the archive W of the DeReKo corpus, which has been composed by the *Institut für Deutsche Sprache* in Mannheim and which encompassed about 2 billion word form tokens at the period when this research was carried out. In what follows, a short overview over the most important findings will be given.

In Chapter 4, it was suggested that there are two possibilities to define a class of modal verbs: a strong definition, which includes all possible uses of each single modal verb lexeme and a weak one, which only considers their epistemic interpretations. In the course of the study, it has been shown that only the weak definition is plausible. The epistemic interpretations of each traditional modal verb behave in a fairly homogeneous manner, as a consequence they can be grouped into a class. In contrast, their circumstantial interpretations are very idiosyncratic. While it is possible to consider the circumstantial readings of single lexical items as a class, such a venture would fail for the entire set of circumstantial modal verbs. As it is impossible to subsume the circumstantial modal verbs into a homogeneous class, the strong definition of modal verbs is not applicable for the traditional six elements in German. Pursuing a weak definition of modal verbs, two further elements have to be integrated: *brauchen* and *werden*. Moreover, it has been shown that epistemic *dürfte* has to be as an independent lexical item.

Moreover, it has been shown in Section 4.3 that the contradictions have already their origin in the term. In grammars of the 17th century, verbs with a preterite present inflection pattern have been subsumed into a particular class. At that time, the motivation was a mere morphological one. Only in the 19th century, grammarians tried to provide additionally a functional motivation for this class. Unfortunately, there was always a mismatch between those verbs with exceptional morphology and those verbs with a remarkable function. Correspondingly, former definitions which are only based on a single motivation result in a much more homogeneous class.

As it has been shown in the Chapter 4, the most remarkable property among the traditional modal verbs is the ability to express epistemic modality. Chapter 5 was dedicated to the examination of the nature of epistemic modality. Two characteristics have been identified: firstly, epistemic modifiers are capable of modifying predications between as identified individual and a predicate which refers to a state which is not likely to change or a predicate which refers to an event in the past. Secondly, the employment of an epistemic modifier indicates that the embedded proposition is not part of the deictic centre's knowledge.

Chapter 6 dealt with the environments from which epistemic modal verbs are banned. Among the 21 non-canonical environments which have been suggested in the literature, there are only eight in which epistemic modal verbs could not have been attested: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive com-

plements in *wh*-clefts, (iii) they do not undergo nominalisations, (iv) they are exempt from adverbial infinitives and they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators.

Furthermore, it has been demonstrated in Section 6.22 that the distinction between a subjective and an objective epistemic modality is misleading and that it cannot account for the distribution of epistemic modal verbs. In particular, the characteristics of objective modality do only apply to single verbs but never to all verbs which are considered as ‘objective’ epistemic. Most of these patterns can more efficiently be treated as (‘subjective’) epistemic instances which exhibit verb-specific idiosyncrasies. The remaining cases are circumstantial modal verbs.

In Chapter 7, it was shown that reportative modal verbs are systematically more flexible with respect to the non-canonical environments discussed above. In contrast to their epistemic counterparts, reportative modal verb are attested: in nominalisations (iii), in adverbial infinitives (iv), embedded under tense auxiliaries (v) and optative operators (viii).

As demonstrated in Chapter 8, the behaviour of epistemic and reportative modal verbs can most efficiently be captured in terms of anchoring conditions regarding the deictic centre. These operators introduce variables for the deictic centre which need to be bound to an appropriate attitude holder. Generally, this variable will be anchored to the most local argument which can be interpreted as an attitude holder. In case, there is none, it will be tied to the most salient referent of the speech act – otherwise the variable will be left uninstantiated. There are other operators, such as circumstantial modal operators or nominalisation operators, which fail to embed linguistics structures which contain an open variable for a deictic centre. As a consequence, epistemic modal verbs can be described as elements of the category verb which introduce a variable for deictic centre which needs to be identified. Thus, they need not be analysed as affix-like elements merged in a functional projection.

Subsequently, Chapter 9 has provided a scenario which can explain how epistemic modal operators emerge. Being event modifiers, circumstantial modal operators are restricted to the modification of events. Yet, they occasionally occur with stative predicates – as long as they can be reinterpreted as events by a pragmatic repair mechanism. If the application of this mechanism becomes to opaque, language learner are likely to reanalyse these modifiers as epistemic modal operators, in particular in contexts in which circumstantial and epistemic modal operators yield a similar communicative effect. As it was seen in Chapter 8, epistemic modal verbs are elements of the category V. Accordingly, the grammaticalisation of epistemic modal verbs can be considered as a process which leaves the syntactic category of the verb intact.

Considering the findings collected above, we are finally in the position to answer the questions raised in Section 2.1:

What is the nature of modal verbs? As for German, the strong definition of modal verbs results in a very imprecise concept which has no value for research. In contrast, the weak definition yields a homogeneous class in which encompasses all epistemic modal verbs. Accordingly, it is recommended to use the term *modal verb* with much awareness or even to abandon it.

What is the nature of epistemic modifiers? They are clausal modifiers which indicate that the embedded proposition is not part of the deictic centre’s knowledge.

What has triggered the grammaticalisation? In virtue of their nature as event modifiers, circumstantial modal verbs are restricted to the modification of events. Sometimes, however, they are combined with stative predicates which are interpreted as events by means of a prag-

matic repair mechanism. As long as language learner are able to detect this repair mechanism, they will analyse these patterns as circumstantial modification. As soon as, the application of the repair mechanism becomes to opaque, the language learner will reinterpret them as epistemic modification which appears to be the less complex and more plausible configuration in this situation.

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Zusammenfassung

Gegenstand dieser Arbeit ist es, die Entstehung der epistemischen Modalverben im Deutschen näher zu beleuchten. Um die Entwicklung von sprachlichen Formen untersuchen zu können, ist es zunächst unabdingbar, den gegenwärtigen Zustand dieser Verben genauestens zu erfassen. Die sogenannten Modalverben verfügen jeweils über verschiedene syntaktische Gebrauchsformen und können jenach Verb unterschiedliche Ausprägungen haben. So gibt es Formen, mit akkusativ NP, mit *daß*-Satz, mit Kontrollinfinitiven, mit ereignisbezogenen Anhebungsinfinitiven, mit reportativen Kontrollinfinitiven, reportativen Anhebungsinfinitiven und eben mit epistemischen Anhebungsinfinitiven. Wie schon an vielen Stellen gezeigt, spiegelt jede dieser syntaktischen Gebrauchsformen eine unterschiedliche Phase im Grammatikalisierungsprozeß wieder. Auf diese Weise lässt sich schon anhand von Sprachdaten aus der Gegenwart der Entwicklungsprozeß dieser Verben im Groben nachvollziehen. Grundlage für die Untersuchung stellt das Archiv W des *Deutschen Referenzkorpus (DeReKo)* dar, welches zum Zeitpunkt der Durchführung 2 Milliarden Wortform-Token umfaßte.

In diesem Sinne gilt es als erstes zu klären, was denn genau unter dem Begriff Modalverb zu verstehen ist. In der traditionellen Sicht werden sechs Verben zu dieser Klasse gezählt: *können*, *müssen*, *wollen*, *dürfen*, *sollen* und *mögen*. Wie sich jedoch zeigt, ist es nicht möglich, diese sechs Elemente zu einer einheitlichen, in sich stimmigen Klasse zusammenzufassen. Das liegt vor allem daran, dass jedes dieser sechs Verben mit unter sehr unterschiedliche syntaktische Gebrauchsformen mit sich bringt, aber auch an der großen Zahl der idiosynkratischen Eigenheiten. Abgesehen davon gibt es noch eine ganze Reihe von anderen Verben, die gleichartige Eigenschaften aufweisen.

Im Gegensatz dazu formen die epistemischen Varianten dieser Verben eine recht einheitliche Klasse. Folglich ist es viel sinnvoller, sich auf eine Klasse von epistemischen Modalverben zu beschränken und alle übrigen syntaktischen Gebrauchsformen jedes dieser Verben außer Acht zu lassen. Das hat jedoch zur Folge, daß weitere Verben, die ebenfalls über eine epistemische Lesart verfügen, hinzugezogen werden müssen, nämlich: *brauchen* und *werden*. Trotz zahlreicher Gemeinsamkeiten werden die Anhebungsverben *scheinen*, *drohen*, *versprechen* und *verheiß*en nicht hinzugezählt und im weiteren Verlaufe nicht mehr berücksichtigt.

Wie sich schließlich zeigt, ist der traditionelle Modalverbbegriff aus wissenschaftlicher Sicht nicht zu halten. Der Konflikt liegt bereits in seiner Geschichte begründet. Im 19. Jahrhundert wurde versucht, eine ursprünglich rein morphologisch begründete Klasse zusätzlich noch semantisch zu untermauern – doch von anfang an offenbarte sich ein Widerspruch zwischen diesen beiden Ansprüchen.

Um die Entstehung der epistemischen Lesarten zu verstehen, ist es am wichtigsten, den Unterschied zwischen den zirkumstantiellen und den epistemischen Gebrauchsformen herauszuarbeiten. Bei eingehender Betrachtung zeigt sich, daß zirkumstantielle Modalverben Ereignisse modifizieren, während hingegen epistemische Modalverben auf Satzebene arbeiten. Darüberhinaus zeigen epistemische Modalverben an, daß die eingebettete Proposition nicht Teil des Sprecherwissens ist. Um den genauen Status von epistemischen Modalverben zu bestimmen, ist

es notwendig, die Umgebungen zu ermitteln, in denen sie nicht auf treten können. 21 solcher Umgebungen wurden im Laufe der letzten Jahrzehnte vorgeschlagen. Wie sich im Zuge der Korpusstudie herausstellte, sind für die epistemischen Modalverben im Deutschen nur acht davon stichhaltig. Sie betreffen im Großen und Ganzen Kontexte, in dem epistemische Modalverben unter andere modale Operatoren eingebettet sind. Während epistemische Modalverben in derartigen Umgebungen völlig ausgeschlossen sind, sind ihre reportativen Gegenstücke darin gelegentlich anzutreffen.

Dieser Sachverhalt lässt sich folgendermaßen sehr wirkungsvoll erklären: epistemische Modaloperatoren führen eine Variable für ein deiktisches Zentrum ein und evaluieren die Gültigkeit der eingebetteten Proposition im Hinblick auf dessen Wissen. Im Regelfall ist das deiktische Zentrum identisch mit dem Sprecher und somit zeigt der Gebrauch eines epistemischen Modalverbs für gewöhnlich an, dass die eingebettete Proposition nicht Teil des Sprecherwissens ist. In jedem Falle muß diese Variable an einen passenden Einstellungsträger gebunden werden. In der Regel wird die Variable durch den Einstellungsträger instantiiert, der am lokalsten zum epistemischen Operator syntaktisch repräsentiert ist. Das kann sein: ein Argument des Modalverbs (wie im Falle von reportativen *wollen* und *sollen*), ein Argument eines unmittelbar syntaktisch übergeordneten Verbs oder der salienteste Referent des Sprechakts, zumeist verkörpert durch den Sprecher selbst. Auf diese Weise wird die Variable von reportativen Modalverben bereits auf sehr lokaler Ebene gebunden, während sie für epistemische Modalverben erst auf Sprechakzebene instantiiert wird.

Nun gibt es aber Operatoren, wie zirkumstantielle Operatoren oder Nominalisierungsoperatoren, die keine Strukturen einbetten können, die eine offene Variable für ein deiktisches Zentrum enthält. Daraus folgt, daß sie reportative Modalverben in jedem Falle einbetten aber nicht epistemische. Folglich läßt sich das Verhalten der epistemischen Modalverben in nicht kanonischen Umgebungen dadurch erfassen, daß sie Variablen einführen, die gebunden werden müssen. In weiterer Folge ist es nicht mehr von Nöten, epistemische Modalverben als affixartige Elemente anzusehen. Vielmehr können sie als Elemente von der Kategorie Verb betrachtet werden.

Im Anbetracht der gegenwärtigen Faktenlagen ergibt sich ein sehr klares Bild für die Grammatikalisierung der epistemischen Modalverben. Die Entwicklung ist ein Übergang von Ereignismodifikation zu Satzmodifikation. In diesem Prozeß bleibt jedoch die Kategorie des Verbs intakt. Diese Ergebnisse wurden anhand Ulrich Schmidts *Neuwe Welt* (1567) überprüft, ein Text aus der Periode, in der sich epistemische Modalverben schlagartig ausbreiteten. Wie sich zeigt, wählt der überwältigende Teil der epistemischen Belege stativ Prädikate als Argument, die für zirkumstantielle Modalverben nicht in Frage kommen. Es besteht kein Zweifel daran, daß die frühesten epistemischen Belege welche waren, die ein statives Komplement hatten. Jedoch treten vereinzelt auch zirkumstantielle Modalverben mit stativen Prädikaten auf. Das funktioniert so lange, so lange diese durch einen pragmatischen Reparaturmechanismus als Ereignisprädikate uminterpretiert werden können. Gelingt es einem Sprachlerner nicht mehr, diesen Mechanismus aufzuspüren, sind der Entstehung von epistemischen Modalverben Tor und Tür geöffnet.

Summary

The aim of this survey is to account for the grammaticalisation of epistemic modal verbs in German. In order to investigate the historical development of linguistic structures, it is indispensable to describe the synchronic status of these elements. The so-called modal verbs involve a whole range of different syntactic patterns, which can be realised in idiosyncratic ways, depending on the specific modal verb. These patterns comprise various complement types: accusative NPs, *daß*-complement clauses, event related control infinitives, event related raising infinitives, reportative control infinitives, reportative raising infinitives and, finally, epistemic raising infinitives. As it has been suggested at many occasions, each of these patterns reflects a different stage in the historical development of the modal verb. Accordingly, it is possible to roughly reconstruct the grammaticalisation of these verbs by means of synchronic language data. As a consequence, this study is based in large parts on synchronic data taken from the *Deutschen Referenzkorpus* ‘German Reference Corpus’ (*DeReKo*) which encompassed about 2 billion word form tokens at the time when the investigation here was undertaken.

First of all, it needs to be clarified what the term *Modalverb* precisely means. Traditionally, it is considered as a class which encompasses six elements: *können* ‘can’, *müssen* ‘must’, *wollen* ‘want’, *dürfen* ‘be.allowed.to’, *sollen* ‘shall’ and *mögen* ‘may’. Yet, it is demonstrated here that these elements do not constitute a homogeneous and consistent class. This is mainly due to the circumstance that each of these verbs can be realised with fairly different syntactic patterns. Furthermore, there are a whole range of related verbs which are characterised by very similar features.

In contrast, the epistemic uses of these verbs form a homogeneous and consistent class. As a consequence, it is much more efficient to focus on a class of epistemic modal verbs which ignores all of the remaining syntactic patterns of each verb. From this it follows that other verbs have to be integrated into this class: *brauchen* ‘need’ and *werden* ‘FUT.AUX’. Despite some similarities, the raising verbs *scheinen*, *drohen*, *versprechen*, *verheißten* should not be considered as members of that class.

As it turns out, the traditional concept of modal verb cannot be maintained from a scientific perspective. This conflict already has its origin in the development of the term “*Modalverb*”. In the 19th century, scholars tried to provide an additional semantic motivation for a class which was only motivated on morphological grounds. Unfortunately, the two motivations were in conflict from the onset on.

In order to understand the evolution of epistemic interpretations, it is necessary to investigate the difference between circumstantial and epistemic modal verbs. On closer inspection, circumstantial modal verbs turn out to be event modifiers and epistemic modal verbs clausal modifiers. Moreover, epistemic modal operators indicate that the embedded proposition is not part of the speaker’s knowledge. The status of epistemic modal verbs can be more thoroughly determined if the environments are considered in which they cannot occur. In the past decades, 21 non-canonical environments for epistemic modal verbs have been proposed. In the course of the corpus study presented here, it has revealed that there are only eight of them in which epistemic

modal verbs are really not attested. Most of these eight environments involve configurations in which the epistemic modal verb occurs in the scope of another operator, such as circumstantial modal operators or nominalisation operators. Interestingly, reportative modal verbs are attested in some of these contexts and they are significantly more acceptable.

This circumstance can most efficiently be captured in terms of anchoring conditions. Epistemic modal operators are operators which introduce a variable for a deictic centre with respect to whose knowledge the validity of the embedded proposition is evaluated. In the most canonical case, the deictic centre is identical to the speaker. Accordingly, the use of an epistemic modal verb indicates that the embedded proposition is not part of the speaker's knowledge. In any case, this variable needs to be anchored to some attitude holder. Generally, this variable is bound to the most local referent which can be interpreted as attitude holder: this can be an argument of the modal verb (such as in the case of reportative *wollen*), an argument of an immediately superordinate predicate or the most salient referent of the speech act, which is the speaker in the most typical case. As a consequence, the variable is bound in a very local configuration in the case of reportative verbs, but only at speech act level in the case of epistemic modal verbs.

As it appears, there are operators which fail to embed linguistic structures which contain open variables for deictic centres, such as circumstantial modal operators or nominalisation operators. From this it follows, that they can embed reportative modal verbs but never epistemic modal verbs, as their variable will not be instantiated at this moment. As a consequence, reportative modal verbs and epistemic modal verbs can both be considered as elements of the category verb.

Regarding these findings, the nature of the grammaticalisation process can more precisely be determined. The development of the epistemic interpretation can be rephrased as a change from event modification into clausal modification. Moreover, the syntactic category of the modal verb remains intact throughout the entire process. Finally, these results were checked against diachronic data from the 16th century, from the period when epistemic modal verbs became frequent in German. As it has turned out, the overwhelming majority of epistemic modal verbs in Ulrich Schmid's *Neuwe Welt* select stative predicates which are not compatible with circumstantial modal verbs. It is beyond doubt that the complements of the first epistemic modal verbs in history were stative predicates. Yet, occasionally, circumstantial modal verbs occur with stative infinitive complements as well. This functions as long as they can be reinterpreted as eventive predicates by means of a pragmatic repair mechanism. As soon as language learners fail to detect this pragmatic repair mechanism, the development of epistemic modal verbs becomes likely.