The syntax-semantics interface in the Chinese *ba*-construction

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Contents

Abbreviations and glosses

The glossing follows the Leipzig Glossing Rules; additionally, I use the following language- and phenomenon-specific glosses and abbreviations:

ADV	adverbial marker 地 *de*
ATTR	attributive particle 的 *de*
BA	把 *bǎ*
BACK	directional verb 回 *huí* (‘move back’)
BEI	被 *bèi*
CCL	*Corpus of the Center for Chinese Linguistics at Beijing University*
CONTINUE	metaphorical directional 下去 *xiàqù* (continuation of an action)
DEG	degree or resultative construction marker 得 *de*
DOWN	directional verb 下 *xià* (‘move downwards’)
EMPH	emphatic cleft construction 是。。。的 *shì . . . de*
FROM.HERE	deictic directional verb 去 *qù*
HSK8000	*Dictionary of Chinese Usage: 8000 Words – HSK Vocabulary Guideline* 汉语8000词词典
INTERR	sentence-final interrogative particle 吗 *ma*
LCMC	*Collection of Chinese Corpora of the University of Leeds*
LOC	locative postnominal particle
MOD	sentence-final particle 了 *le*
NEG.PFV	perfective negative particle 没 *méi*
RES	resultative complement in a resultative compound
TO.HERE	deictic directional verb 来 *lái*
TURN.INTO	valence-increasing resultative complement 成 *chéng*, denoting the transformation of an entity into another entity
UP	directional verb 上 *shàng* (‘move upwards’)

Introduction

In Indo-European linguistics, argument structure has long been considered as a level of linguistic representation in its own right. Early approaches, such as Fillmore's Case Grammar (Fillmore, 1968, 1971a,b), assume that universal mapping principles can predict the surface realization of a predicate's arguments from the lexical representation of this predicate. In turn, the lexical representation consists of a list of semantic role labels. This view obscurs the metalevel status of argument structure at the syntax-semantics interface. After the discovery of a range of phenomena that cannot be explained if semantic analysis stops at the level of semantic roles, researchers have paid more attention to the real-world properties of events, commonly referred to as "event structure". Thus, frequent primitive event components, multiple "tiers" of semantic roles (aspectual, causal) as well as typical modes of involvement of event participants have been considered as the syntactically relevant aspects of predicate meaning (Anderson, 1971; Ostler, 1979; Jackendoff, 1983, 1990; Dowty, 1991; van Valin, 1993; Tenny, 1992, 1994; Reinhart, 2000, 2001, 2002; Ackermann and Moore, 2001).

These more recent approaches still take participant structure as the main determinant of argument structure. This seems to be appropriate at the level of lexical representation; however, once we consider alternative argument realization patterns that reflect different construals of the same event, participant structure may not be sufficient to contrast these patterns against each other. Facing this problem,

authors have frequently recurred to pragmatic and information-structural treatments, explaining the motivation behind argument alternations by different discourse properties and patterns of profiling or emphasis of the participants.

If we consider Chinese, the traditional approach to argument structure appears to be even more problematic. Syntactic relations in Chinese are not as clearly defined as for Indo-European languages. Besides, the language comes with a rather unusual system of argument realization: while imposing strict constraints on constituent order, the language leaves a lot of freedom in the expression of arguments. Syntactic NP positions can be instantiated with a variety of semantic arguments; various options for argument sharing, omission, addition and splitting challenge approaches that view the lexicon as main determinant of argument structure and realization.

This study focusses on the Chinese *bǎ*-construction, which is one of the few marked options for argument realization in Chinese. The basic structure of the *bǎ*-construction, as contrasted to the basic SVO constituent order, is as follows:

(1) a. 他 吃 了 苹果。
Tā chī le píngguǒ.
he eat PFV apple
'He ate (the) apple(s).'

b. 他 把 苹果 吃 了。
Tā *bǎ* píngguǒ chī le.
he BA apple eat PFV
'He ate the apple(s).'

Thus, in the *bǎ*-construction, the object is preposed into the preverbal position, where it is marked by the morpheme 把 *bǎ*. Simple at first sight, the construction reveals a number of controversies upon closer consideration. Central issues such as meaning, syntactic structure and productivity constraints have been under in-

tensive debate since the first studies by Li Jinxi (1932), Wang Li (1943) and Lü Shuxiang (1948).

The guiding observation of the present study is that the *bǎ*-construction comes with a number of different options for argument distribution – it accommodates lexical predicates with different argument structures and, besides, may be used for the creation of additional argument positions. In view of this variety of possible argument distributions, argument structure in its traditional sense of mapping between semantic roles and syntactic relations seems not an appropriate tool if we aim at providing a uniform analysis. In the following, I maximally abstract from the argument structure of the instantiating lexical predicates and consider *bǎ* as a head that nails down central aspects of the semantics of its clause. Thus, some event-structural components can be independently contributed by *bǎ*. Besides, the *bǎ*-construction is pragmatically marked: it comes with specific information packaging patterns pertaining both to the event participants and the subevents and may contribute to subjectification and epistemic modality. Once we formulate the semantics of *bǎ* in an underspecified event-structural "template" that captures these facts, the possible argument distributions naturally follow from a compatibility requirement between this template and the entailments on participants that come from the instantiating lexical predicates.

The present text mainly uses data from the linguistic literature and from two online corpora, namely the Chinese Internet Corpus and the Lancaster Corpus of Mandarin Chinese, which are contained in the Collection of Chinese Corpora of the University of Leeds, and the corpus of the Center for Chinese Linguistics at Beijing University. A small part of data and judgements are taken from Google and native speakers and annotated as such; however, due to significant idiosyncratic and local differences in Chinese, these data are not considered as evidence in its own right and are used for the illustration and support of observations which

can be backed up by more reliable data.

The present study is organized as follows: in **Chapter 1**, I set the empirical background with a description of the generally acknowledged properties of the *bǎ*-construction. In order to facilitate the understanding of the following discussion and to avoid the isolated consideration of the *bǎ*-construction, this chapter also presents a range of other structures that frequently alternate or co-occur with the construction.

Chapter 2 presents an overview of the work on the *bǎ*-construction; although it is unrealistic to accommodate all existing analyses, I hope to provide an overview over the main issues and perspectives that can be used for further discussion. The chapter shows how the issues of syntactic status, productivity constraints and semantic contribution of *bǎ* have been treated in the literature.

Chapter 3 takes a theoretical stance and deals with the domain of argument structure, selection and realization. After describing the stages of the argument selection process, I present the traditional approach which uses semantic roles and mapping principles that go from semantic roles to grammatical functions. It is then shown that this approach raises a number of empirical and theoretical problems; these issues have led to the development of more sophisticated approaches to the semantic side of argument structure such as decomposition of predicate meanings and semantic roles.

Still, semantic decomposition does not explain the underlying motivation behind subcomponents of events and their configurations that are relevant for syntax-semantics mapping. Therefore, in **Chapter 4**, I concentrate on the semantic underpinnings of argument structure; I consider the semantic categories of aspectual classes, telicity, affectedness and transitivity and show how they have been formalized in the literature. Finally, I describe the main concepts of scalar semantics, a paradigm for event conceptualization which has recently attracted vivid interest

and provides a convenient abstraction for generalizations over different types of events.

Chapter 5 uses the theoretical notions elaborated in Chapters 3 and 4 and presents a model-theoretic formulation of the semantics of *bă*. A special focus is put on the semantic properties of lexical predicates that are acceptable in the *bă*-construction. I formulate a lexical entry which assumes that *bă* is a head and constrains the lexical predicate in the construction to contain a scale and to specify a difference value on that scale. Additionally, *bă* requires the presence of a causer argument which instantiates the sentence-initial position and may be selected either by the verb or by *bă* itself.

In **Chapter 6**, I present the HPSG framework and summarize existing approaches to the relevant issues, such as valence, argument distribution and linking. **Chapter 7** outlines some prerequisites that are required for a thorough analysis of the construction in HPSG. Specifically, I formalize the scalar notions that are necessary for the formulation of semantic constraints on the construction. The chapter also provides HPSG analyses of structures that often co-occur with the verb in the *bă*-construction and potentially impact on its acceptability.

Finally, in **Chapter 8**, I present an HPSG analysis of the *bă*-construction which implements the semantic constraint proposed in Chapter 5 and provides a syntactic frame for the *bă*-construction; the argument distribution is determined by the argument structure of the lexical predicate and a set of relations between argument roles and selectional restrictions.

Chapter 1

The data: *bǎ*-construction and related structures

This chapter sets the empirical background for the following theoretical discussion and analysis. The first part of the chapter deals with the general characteristics, central constraints and the historical origins of the *bǎ*-construction; in the second part, I briefly present a range of other structures whose basic understanding is necessary in order to integrate the *bǎ*-construction into the general system of Chinese grammar.

1.1 Basic properties of the *bǎ*-construction

1.1.1 Object preposing as the canonical form

In the canonical form, the *bǎ*-construction is a transitive clause pattern with the structure [Subject *bǎ* Object Predicate]; the following pair of examples shows an SVO clause and its "*bǎ*-counterpart":

(2) a. 他 吃 了 苹果。
Tā chī le píngguǒ.
he eat PFV apple
'He ate (the) apple(s).'

b. 他 把 苹果 吃 了。
Tā bǎ píngguǒ chī le.
he BA apple eat PFV
'He ate the apple(s).'

Semantically, the change in sentence structure mainly impacts on the referential properties of the object NP and the aspectual properties of the clause. Thus, whereas the object is underspecified with respect to definiteness or specificity in (2a), in (2b) it obligatorily receives a definite or specific interpretation, which also enforces a telic interpretation of the event.

The *bǎ*-construction cannot be arbitrarily formed from any SVO clause. The productivity of the construction is subject to constraints on three factors: the semantics of the predicate, the semantics of the *bǎ*-NP and pragmatic properties of the discourse context. Some of the frequently stated constraints are:

- Expression of affectedness, disposal or causation by the predicate (Wáng, 1943; Pān, 1981; Sòng, 1979, 1981; Hsueh, 1989; Shěn, 2002; Shī, 2010):

(3) 他 把 苹果 吃 / *找 了.
Tā bǎ píngguǒ chī / *zhǎo le.
he BA apple eat look.for PFV
'He ate / looked for the apple(s).'

- Aspectual delimitedness of the event (Mei, 1978; Hopper and Thompson, 1980; Szeto, 1988; Yong, 1993; Liu, 1997a):

(4) 他 把 苹果 吃 *(了).
Tā bǎ píngguǒ chī *(le).
he BA apple eat PFV
'He eats/ate the apple(s).'

- Specificity or genericity of the *bǎ*-NP (Liu, 1997a):

(5) ?他 把 一些 苹果 吃 了。
Tā bǎ yīxiē píngguǒ chī le.
he BA some apple eat PFV
'He ate some apples.'

These constraints are subject to issues of definition and have received different interpretations in the literature. I postpone their detailed discussion until Chapter 2, which summarizes the corresponding literature.

The "additional verbal dependent constraint"

The "additional verbal dependent constraint", first observed by Lǚ (1948), states that the *bǎ*-construction cannot be formed with a bare verb:

*[. . .[bǎ NP V]]

The following examples illustrate:

(6) a. 他 把 苹果 吃 *(了.)
Tā bǎ píngguǒ chī *(le).
he BA apple eat PFV
'He ate the apple(s).'

b. 他 把 我 气-*(死) 了。
Tā bǎ wǒ qì-*(sǐ) le.
he BA me annoy-dead.RES PFV
'He annoyed me to death.'

In (6a), the perfective aspect marker cannot be omitted. Similarly, in (6b), the verb cannot stand alone; it has to combine not only with the aspect marker, but also with an additional lexical dependent, for example a resultative complement.

Different "inventories" of possible additional complements have been proposed in the literature (Lǚ, 1948; Sybesma, 1999; Liu, 1997b; Li, 2001). For instance, Li (2001) states that the required additional element can be one of the following:

1. Resultative complement
2. Adverb of duration, frequency or manner
3. Verb reduplication, indicating short duration
4. "Outer" object: NP whose referent stands in a part-whole or inalienable possession relation to the *bǎ*-NP
5. Aspect markers: perfective 了 *le*, durative 着 *zhe*
6. Manner adverbs

At first sight, this set appears to be rather disparate and unstructured: it is difficult to think of criteria which would characterize its members. The list mixes grammatical elements (aspect markers) and lexical dependents. Besides, it does not single out the subset of dependents that can actually make the wellformedness contrast. Once we make these distinctions, the list of lexical dependents that can trigger an acceptability contrast reduces to the following:

1. Resultative complements
2. Expressions indicating short duration or punctuality of the event
3. Manner adverbs with degree modifier
4. Source/goal arguments, directional complements

To illustrate, the following examples show instantiations of the *bǎ*-construction with obligatory additional dependents:

(7) a. V + manner adverb modified for degree:

张三　　把 这 事　想　*(得　太 悲观)。
Zhāngsān bǎ zhè shì　xiǎng *(de　tài bēiguān).
Zhangsan BA this affair think　DEG too pessimistic

'Zhangsan thinks too pessimistically about this affair.'

b. V + punctualizer:

他 把 狗 看　了　*(一 眼)。
Tā bǎ gǒu kàn le　*(yī yǎn).
he BA dog look PFV　one eye

'He caught a glimpse of the dog.'

c. V + resultative complement:

张三　　把 马克 烦-*(死)　　了。
Zhāngsān bǎ Mǎkè fán-*(sǐ)　　le.
Zhangsan BA Mark annoy-dead.RES PFV

'Zhangsan annoyed Mark to death.'

d. V + goal argument:

阿明　把 自行车　骑-*(回 家)　了。
Āmíng bǎ zìxíngchē qí-*(huí jiā)　le.
he　BA bike　ride　back home PFV

'He rode the bike back home.'

e. V + source argument:

王　老师　把 手　离开 了　*(门把)。
Wáng lǎoshi　bǎ shǒu líkāi le　*(ménba).
Wang teacher BA hand leave PFV　door

'Teacher Wang took his hand from the door handle.'

f. V + directional complement:

阿明 把 钱 赢 了 *(回来)。
Āmíng bǎ qián yìng le *(huí-lái).
Aming BA money win PFV back-come

'Aming "won the money back".'

1.1.2 Argument distributions

So far, we have looked at "canonical" *bǎ*-constructions: the predicates were transitive verbs, possibly with additional dependents. The thematic structure of these clauses can be straightforwardly accounted for in terms of a bipartite distinction between AGENT and THEME; the distribution of semantic roles among the syntactic argument positions is as follows:

(8)

AGENT	*bǎ*	THEME	Pred
Tā	bǎ	píngguǒ	chī le.
he	BA	apple	eat PFV
He ate	the	apple.	

Besides this form, the *bǎ*-construction allows for a range of other argument distributions:

- In locative *bǎ*-clauses, the verb takes two internal arguments - a MATERIAL and a LOCATION argument. Both arguments can appear in the *bǎ*-NP position; the other internal argument is realized postverbally:

(9) a. Preposing of MATERIAL:

我 把 水 装 在 锅-里。
Wǒ bǎ shuǐ zhuàng zài guǒ-lǐ.
I BA water fill in pot-LOC
intended: 'I filled the water in the pot.'

b. Preposing of LOCATION:

我 把 锅子 装-满 了 水。
Wǒ bǎ guǒzi zhuàng-mǎn le shuǐ.
I BA pot fill-full.RES PFV water
'I filled the pot with water.'

These clauses are reminiscent of the locative alternation in English and other languages; however, the locative alternation operates on the same lexical predicate. In the *bǎ*-construction, the preposing of the LOCATION requires the matrix verb to be combined with an additional resultative predicate (e. g. 满 *mǎn*: 'full' in (9b)).

- Intransitive *bǎ*-clauses: the subject of a *bǎ*-clause can almost always be omitted; however, the construction still implies the existence of some causing or acting entity. Thus, the omitted causer or actor can often be recovered from context; otherwise, the use of the *bǎ*-construction simply stresses the fact that the described event was caused externally instead of happening by itself:

(10) a. 把 只 鸡 跑-掉 了。
Bǎ zhī jī pǎo-diào le.
BA one-CLF chicken run-loose PFV
'A chicken ran away.' (*implies*: 'Somebody let a chicken run away.')

b. 把 我 吓-死 了。
Bǎ wǒ xià-sǐ le.
BA me frighten-die.RES PFV
'I was frightened to death.' (*implies*: 'Something frightened me to death.')

- Causative *bǎ*-clauses: *bǎ* acts as causative device, selecting an additional cause argument in the subject position:

(11) 这 件 事 把 他 哭-累 了。
Zhè jiàn shì bǎ tā kū-lèi le.
this CLF affair BA he cry-tired.RES PFV
'This affair made him cry to the extent of becoming tired.'

- Clauses with additional NPs in postverbal position ("retained" or "outer" objects): the object of the verb is realized postverbally. The *bǎ*-NP is not an argument of the verb. It stands in a modification relation to the postverbal NP; common relations are the part-whole relation, inalienable possession, result and location:

(12) a. Part-whole:

阿明 把 五 个 苹果 吃 了 三 个。
Āmíng bǎ wǔ ge píngguǒ chī le sān ge
Aming BA five CLF apple eat PFV three CLF

'Aming ate three apples out of five.'

b. Result:

阿明 把 衣服 包 了 一 个 小包.
Āmíng bǎ yīfu bāo le yī ge xiǎobāo.
Aming BA clothes pack PFV one CLF small.package

'Aming packed the clothes into a small package.'

c. Location:

阿明 把 壁炉 生 了 火。
Āmíng bǎ bìlú shēng le huǒ.
Aming BA fireplace make PFV fire

'Aming made fire on the fireplace.'

Table 1.1 summarizes the possible distributions of arguments among the NP slots.

	Type of *bǎ*-construction	Roles				
		NP1	bǎ	NP2	V	NP3
1	Obj. preposing	Ag		Theme		-
2	Locatives	Ag		Mat		Loc
		Ag		Loc		Mat
3	Intrans.-unerg.	-		Ag		-
	Intrans.-unacc.	-		Exp		-
4	Causative (complex events)	Cause		Causee		-
5	Retained object	Agent		Modifier of theme		Theme

Table 1.1: Argument distributions in the *bǎ*-construction

1.1.3 Syntactic flexibility in the *bǎ*-construction

In line with the relatively fixed constituent order in Chinese, the syntactic flexibility of the *bǎ*-construction is very restricted; this makes it unavailable for a number of grammatical tests and obscures its syntactic status. Constituent order variation inside of the *bǎ*-construction is impossible: the sole possible order is NP *bǎ* NP V XP. The only option of syntactic action here is the omission of the clause-initial NP in cases where the agent or causer is irrelevant or can be inferred from context (see intransitive *bǎ*-constructions in the previous section, e. g. (10)). In the following, I show how the *bǎ*-construction combines with additional material and interacts with other syntactic structures.

Adjunct placement The *bǎ*-construction accommodates adjuncts in two positions, namely between subject and *bǎ* (13a) and between *bǎ*-NP and verb (13b):

(13) a. 阿明 也 把 苹果 吃 了。
Āmíng yě bǎ píngguǒ chī le.
Aming also BA apple eat PFV
'Aming also ate the apple(s).'

b. 阿明　把 苹果　也　吃 了。
Āmíng bǎ píngguǒ yě chī le.
Aming BA apple also eat PFV
'Aming also ate the apple(s).'

The position between *bǎ* and the *bǎ*-NP is not available for adjuncts:

(14) * 阿明　把 也　苹果　吃 了。
Āmíng bǎ yě píngguǒ chī le.
Aming BA also apple eat PFV
'Aming also ate the apple(s).'

The two examples in (13) have different readings: in (13a), the adverb *yě* is interpreted with wide scope:

(15) $[\![Aming]\!] \in \{x \mid \text{eat(apple)}(x)\}$
(*Aming is member of the set of entities who ate the apples.*)

In (13b), *yě* takes narrow scope:

(16) $[\![\text{apples}]\!] \in \{x \mid \text{eat}(x)(\text{Aming})\}$
(*The apples are in the set of entities that Aming ate.*)

Note that *yě* is a backward-referring adverb: it modifies constituents that precede it. Thus, the *bǎ*-construction is the default choice for expressing the narrow scope reading: it is normally not obtained in an SVO clause, where the only position available for the adjunct is between subject and verb:

(17) 阿明　也 吃 了　苹果。
Āmíng yě chī le píngguǒ.
Aming too eat PFV apple
'Aming, too, ate apples.'
#'Aming ate apples, too (among other things)'.

Negation and modality Negation particles and modal verbs can only be placed in the position between subject and *bǎ*:

(18) a. 他 没有 把 苹果 吃。
Tā méiyǒu bǎ píngguǒ chī.
he NEG.PFV BA apple eat
'He didn't eat the apple.'

b. 他 可以 把 苹果 吃。
Tā kěyǐ bǎ píngguǒ chī.
he can BA apple eat
'He can eat the apple.'

The immediate preverbal position is not available; this distinguishes the *bǎ*-construction from sentences with preverbal PPs, which can be followed by negators or modals:

(19) a. * 他 把 苹果 没有 吃。
Tā bǎ píngguǒ méiyǒu chī.
he BA apple NEG.PFV eat
'He didn't eat the apple.'

b. 他 在 食堂 没有 吃饭。
Tā zài shítáng méiyǒu chīfàn.
he at dining.hall NEG.PFV eat.rice
'He didn't eat at the dining room.'

Coordination Huang et al. (2009) give the following examples for coordination in the *bǎ*-construction:

(20) a. 他 把 门 洗-好, (把) 窗户 擦-干净 了。
Tā bǎ mén xǐhǎo, (bǎ) chuánghu cā-gānjìng le.
he BA door wash, (BA) window wipe-clean.RES PFV
'He washed the door and wiped the window clean.'

b. 你 把 这 块 肉 切-切, (把) 那 些 菜 洗-洗
Nǐ bǎ zhè kuài ròu qiēqiē, (bǎ) nà xiē cài xǐxǐ
you BA this CLF meat cut-cut, (BA) those CLF vegetables wash-wash
吧！
ba!
IMP
'Cut this meat a bit, and wash the vegetables!' (Huang et al., 2009, p. 166–167)

The sequence following *bǎ* can be coordinated; *bǎ* may or may not be repeated in the second conjunct.

Long distance dependencies The *bǎ*-construction allows for long-distance dependencies:

(21) 你 赶快 把 这 件 事 找 人 告诉 李四！
Nǐ gǎnkuài bǎ zhè jiàn shì zhǎo rén gàosu Lǐsī!
you quick *bǎ* this CLF affair find people tell Lisi
'You should quickly find somebody to tell Lisi about this affair!' (adapted from Bender, 2000, p. 113)

Here, the relation between the two verbs is a control relation; the direct object of the embedded VP is extracted and appears as *bǎ*-marked NP in the matrix clause. Long distance dependencies with the *bǎ*-construction seem to be rare in language use; they are mostly used in the imperative mode and are not fully productive:

(22) * 你 把 狗 找 人 打-死。
Nǐ bǎ gǒu zhǎo rén dǎ-sǐ.
you BA dog find people beat-dead.RES
'Find someone to beat the dog to death.'

1.1.4 Grammaticalization of the *bǎ*-construction

The diachronic development of *bǎ* provides important clues about its syntactic status in Modern Chinese. Originally, *bǎ* was a verb with the meaning *hold, manipulate*. Sun (1996) follows the view of traditional Chinese grammar and assumes that *bǎ* has developed into a preposition; he identifies three stages in the grammaticalization of *bǎ* which are shown in Table 1.2.

	1. Middle Chinese	2. Early Modern Chinese	3. Modern Chinese
Part of speech	Verb	Coverb	Preposition
Meaning	*hold*	*to take*	change of state

Table 1.2: The grammaticalization of *bǎ*

In clause structure, *bǎ* originally figured as a lexical predicate and has by now lost its lexical autonomy. This is parallelled by the canonical part-of-speech change from verb to preposition which is common for verbs with general meanings. Semantically, the original meaning of physical control or manipulation is replaced by the more abstract and general meaning of causation. The following examples illustrate the three stages:

(23) a. 1st century BC (Middle Chinese):

璧公　把　　小　器。
Bì gōng bǎ　　xiǎo qì.
Bi Duke BA(HOLD) small weapon

'The Duke Bi **held** a small weapon.'

b. 10th century CC (Early Modern Chinese):

去 把　　那 封　信书　来。
Qù bǎ　　nà fēng xìnshū lái.
go BA(TAKE) this CLF letter come

'Go **get** that letter.'

c. Modern Chinese:

他 把 苹果 吃 了。
Tā bǎ píngguǒ chī le.
he BA apple eat PFV

'He ate the apple.'

Following Lehmann (1985), Sun (1996) shows that *bǎ* has the typical features of lexemes that undergo grammaticalization processes. Thus, *bǎ* looses in semantic as well as in phonological substance: in Early Chinese, *bǎ* was pronounced with a full third tone – the longest in the inventory of Chinese tones. At present, *bǎ* is often pronounced with a neutral tone; besides, the 'a' is frequently reduced to a 'schwa'. The grammaticalization is accompanied by a loss of syntactic autonomy: before the 18th century, *bǎ* could be used without an overt nominal; the object of *bǎ* would then be recovered from context. However, the *bǎ*-NP is obligatory in Modern Chinese.

Sun (2008) proposes yet another explanation of the grammaticalization process of *bǎ*. He views the development of *bǎ*-sentences as "clause union" which happens when two clauses, each with an independent predicate and a separate event description, merge into one complex clause; semantically, the two events are constructed as a single event through the process of event integration. Event integration is particularly apt to occur when the two events have shared referents. Thus, the grammaticalization of *bǎ* seems to have proceeded from a verb with a rather general (functional) meaning that was subsequently used as an "auxiliary" device in serial verb structures and then, by referent sharing, evolved into the present-day form..

1.2 Related structures

1.2.1 Structures that (don't) alternate with the *bǎ*-construction

In this section, I describe syntactic structures whose meanings are similar to that of the *bǎ*-construction. Although there is often a relationship of structural substitutability between the *bǎ*-construction and these structures, it should be observed that the substitution always comes with semantic-pragmatic variation.

SVO clauses

The SVO clause is the most straightforward counterpart to the canonical object preposing form of the *bǎ*-construction. Many analyses consider the *bǎ*-construction as a "derivation" from the canonical SVO order; indeed, the traditional analysis of the *bǎ*-construction considers *bǎ* as a preposition that moves the object into preverbal position:

(24) S V O → S P[*bǎ*] O V

However, there are many cases in which the *bǎ*-construction does not have an SVO counterpart. First, the instantiation of the postverbal domain in Chinese is rather restricted. Some authors (Li, 1990; Sybesma, 1999) have claimed that it can be occupied only by one complement. If the clause contains a complement that can appear but in the postverbal position, the direct object has to be preposed, whereby the *bǎ*-construction seems to be the default, least marked choice:

(25) a. * 他 看 狗 得 很 详细。
Tā kàn gǒu de hěn xiángxì.
he look dog DEG very careful
'He had a careful look at the dog.'

b. 他 把 狗 看 得 很 详细。
Tā bǎ gǒu kàn de hěn xiángxì.
he *bǎ* dog look DEG very careful
'He had a careful look at the dog.'

Some argument structure patterns and ditransitive verbs require three syntactic argument positions; in these cases, the *bǎ*-construction can be used to create an additional position (cf. Section 1.1). In causative clauses, *bǎ* contributes a causal relation and selects the causer argument in sentence-initial position:

(26) 这 件 事 把 他 哭－累 了。
Zhè jiàn shì bǎ tā kū-lèi le.
this CLF affair BA he cry-tired.RES PFV
'This affair made him cry to the extent of becoming tired.'

Finally, information-structural and pragmatic factors may block the realization of the object in postverbal postion. Song (2006) analyzes a set of semantic types of resultative predicates which trigger the preposing of the object. He motivates this by the focus character of the clause-final position; thus, resultative predicates that denote a more specific and less predictable result are focussed and enforce object preposing:

(27) Excessive resultatives (带偏离补语 *dài piānlǐ bǔyǔ*):

a. * 他 炒-咸 了 菜。
Tā chǎo-xiàn le cài.
he fry-salted.RES PFV vegetables
'He fried the vegetables until they became oversalted.'

b. 他 把 菜 炒-咸 了。
Tā bǎ cài chǎo-xiàn le.
he BA vegetables fry-salted.RES PFV
'He fried the vegetables until they became oversalted.'

(28) Descriptive resultatives (描写性补语 *miǎoxiěxìng bǔyǔ*):

a. * 他 炸-黄 了 茄子片儿。
Tā zhá-huáng le qiēzipiànr.
he fry-yellow.RES PFV aubergine
'He fried the aubergines until they became yellow.'

b. 他 把 茄子片儿 炸-黄 了。
Tā bǎ qiēzipiànr zhá-huáng le.
he BA aubergine fry-yellow.RES PFV
'He fried the aubergines until they became yellow.'

(29) Spontaneously created resultatives (临时创作的动结式 *línshí chuàngzuò de dòngjiéshì*):

a. * 他 坐-灭 了 灯。
Tā zuò-miè le dēng.
he sit-extinguish.RES PFV light
'He extinguished the light while sitting down.'

b. 他 把 灯 坐-灭 了。
Tā bǎ dēng zuò-miè le.
he BA light sit-extinguish.RES PFV
'He extinguished the light while sitting down.'

(30) Resultative constructions with subjective emphasis on the complement:

a. * 我 早 就 吃-够 了 苦。
Wǒ zǎo jiù chī-gòu le kǔ.
I long.before already eat-enough.RES PFV sorrow
'I suffered enough sorrow long ago already.'

b. 我 早 就 把 苦 吃-够 了。
Wǒ zǎo jiù bǎ kǔ chī-gòu le!
I long.before already BA sorrow eat-enough.RES PFV
'I suffered enough sorrow long ago already.'

The *bèi*-construction

The *bèi*-construction is another extensively discussed argument structure pattern in Chinese which preposes the object into preverbal position. It is often considered on a par with the *bǎ*-construction (Lu, 1980; Hsueh, 1989; Kit, 1992); the two constructions expose similar semantic constraints but complementary discourse-structural patterns.

In the canonical *bèi*-construction, the logical object of the verb is placed in sentence-initial position; the particle 被 *bèi* is inserted between object and verb. The construction shares properties with passive constructions in other languages. It comes in two forms: in the "long" passive, *bèi* is followed by the agent NP:

(31) 张三　　被　李斯 打 了。
Zhāngsān bèi *Lǐsī* dǎ le.
Zhangsan BEI Lisi hit PFV
'Zhangsan was hit by Lisi.'

By contrast, in the "short" passive, *bèi* is followed directly by the verb; the agent is left unexpressed:

(32) 张三　　被　打 了。
Zhāngsān bèi dǎ le.
Zhangsan BEI hit PFV
'Zhangsan was hit.'

A major controversy in the literature is whether the two forms should be given an unified analysis: some authors, e. g. Ting (1995) and Her (2009), claim that (32) is derived from (31) by deletion of the agent NP. Other studies, e. g. Huang et al. (2009) come to the conclusion that the two constructions have different underlying structures: in the long passive, *bèi* is considered as the main verb subcategorizing for a clausal complement. In the short passive, *bèi* takes a VP complement whose empty object is controlled by the sentence-initial NP.

More detailed analyses of the construction can be found in Hashimoto (1987), Cheng et al. (1993), Feng (1995), Ting (1995), Feng (1998) and Huang (1999), *inter alia*.

Topicalization

Beyond the *bǎ*- and *bèi*-constructions, Chinese provides three unmarked strategies for placing the object in preverbal position and thus increasing its semantic and pragmatic prominence. First, the object can be preposed into the clause-initial position; this is the form of the standard topicalization structure:

(33) 衣服 他 洗 了。
Yīfu tā xǐ le.
clothes he wash PFV
'The clothes, he washed them.'

Second, the object can be placed in the position between subject and verb.[1] This is the same position that is occupied by *bǎ* with its NP:

(34) 他 衣服 洗 了。
Tā yīfu xǐ le.
he clothes wash PFV
'He washed the clothes.'

Finally, a structural parallel has been established between the *bǎ*-construction and unaccusative clauses ; Zhū observes that the string following *bǎ* can in most

[1]This structure is rather rare in real language use and is often judged unacceptable by native speakers. In view of the ambiguity that arises with respect to the subject/object distinction in the two described topicalization constructions, they are subject to selectional restrictions and often dispreferred by language users.

cases form an autonomous clause (Zhū, 1982, p. 91):[2]

(35) a. 他 把 衣服 洗-干净 了。
Tā bǎ yīfu xǐ-gānjīng le.
he BA clothes wash-clean.RES PFV
'He washed the clothes clean.'

b. 衣服 洗干净 了。
Yīfu xǐ-gānjīng le.
clothes wash-clean.RES PFV
'The clothes have been washed clean.'

Unaccusative clauses share two important constraints with the *bǎ*-construction: in unaccusatives, the subject must be definite or generic, just as the *bǎ*-NP in the *bǎ*-construction. Besides, the predicate must be "complex": it may not be instantiated by a single verb; the verb has to combine with additional elements.

Bender (2000) treats the *bǎ*-construction on a par with "unmarked passives", which correspond to Zhū's unaccusative sentences. She presents arguments from binding and ditransitive verbs. Thus, the *bǎ*-NP can bind the subject-oriented anaphor 自己 *zìjǐ*:

(36) 领导$_i$ 把 他$_j$ 下放到 了 自己$_{i/j}$ 的 老家。
Lǐngdǎo$_i$ bǎ tā$_j$ xiàfàngdào le zìjǐ$_{i/j}$ de lǎojiā.
boss BA he move PFV own ATTR home.place
'[The boss]$_i$ moved him$_j$ to his$_{i/j}$ hometown.'

[2] Alternatively, the subject NP can be omitted, while *bǎ* remains in place:

(i) 把 衣服 洗-干净 了。
Bǎ yīfu xǐ-gānjīng le.
BA clothes wash-clean.RES PFV
'The clothes have been washed clean.'

However, as pointed out by the author, this is a rather weak test because the reference of *zìjǐ* is determined on semantic-pragmatic rather than on syntactic grounds (cf. Huang 1994).

Another argument comes from ditransitive verbs: the *bǎ*-NP corresponds to the transferred entity argument; it cannot accommodate the recipient:

(37) a. 他把钱 给了我。
Tā bǎ qián gěi le wǒ.
he BA money give PFV me
'He gave me the money.'

b. *他把我给了钱。
Tā bǎ wǒ gěi le qián.
he BA me give PFV money
'He gave me money.'

This is paralleled by the fact that the unmarked passive cannot be formed with the recipient in subject position:

(38) a. *我给了钱。
Wǒ gěi le qián.
me give PFV money
'I was given money.'

b. 钱 给了我。
Qián gěi le wǒ.
money give PFV me
'The money was given to me.'

Zhāng (2009) observes a meaning difference between *bǎ*-construction and its unaccusative counterpart. He considers subject-oriented adverbials that signal the unintentionality of an act (不幸 *bùxìng*, 不巧 *bùqiǎo*: 'misfortunately', 'as luck would have it'; 不了 *bùliào*: 'accidentally'). The unaccusative clauses are ac-

ceptable with these adverbials, whereas the corresponding *bǎ*-constructions are not:

(39) a. (*把) 杯子 不幸 打破 了。
(*Bǎ) bēizi bùxìn dǎpò le.
BA cup accidentally break PFV
'Someone broke the cup accidentally.'

b. (*把) 稿纸 不巧 弄丢 了。
(*Ba) gàozhi bùqiáo nòngdiū le.
BA paper misfortunately loose PFV
'The paper was misfortunately lost.'

According to Zhāng (2009, p. 90), this pertains to the semantic contribution of *bǎ*, which signals that the causer is responsible for the action and thus may not have committed it unintentionally (cf. also Section 2.3.2).

Verb copy

We have seen that a conflict arises if we want to use a transitive verb, whose object is normally placed postverbally, together with an additional element that is restricted to occur in postverbal position. There seem to be two main strategies for "freeing up" the postverbal position for the additional element: the *bǎ*-construction and the verb copy construction, which has the following structure:

(40) Subj V Obj V-copy Add.dep.

The following illustrates:

(41) 他 看 书 看 了 两 个 小时。
Tā kàn shū kàn le liǎng ge xiǎoshí.
he read book read PFV two CLF hour
'He read for two hours.'

Negation particles and nonmovable adverbs are always placed before the second verb:

(42) 他 看 书 没 看 两 个 小时。
Tā kàn shū méi kàn liǎng ge xiǎoshí.
he read book NEG.PFV read two CLF hour
'He didn't read for two hours.'

The verb copy construction is perceived as less marked than the *bǎ*-construction. The main semantic difference seems to be the status of the object NP: in the *bǎ*-construction, the preposed object tends to be definite and topical, whereas the verb copy construction is preferred for indefinite, less salient objects. According to Li and Thompson, it is used if the object is nonreferential; specific referential objects normally trigger the *bǎ*-construction (Li and Thompson, 1981a, p. 447–448).

1.2.2 Complement structures

De-complements

The particle 得 *de* has a multifunctional use in Chinese; it is mainly used to combine verbs with expressions of manner (43a) and result (43b):

(43) a. 他 跑 得 很 快。
Tā pǎo de hěn kuài.
he run DEG very fast
'He runs very fast.'

b. 他 跑 得 很 累。
Tā pǎo de hěn lèi.
he run DEG very tired
'He ran and as a result became tired.'

The general structure is as follows:

(44) V + *de* + COMPL (AP/VP/S)

The complement can be an AP, a VP or a clause. The above examples show AP complements; the following illustrate VP (45a) and clause complements (45b):

(45) a. 他 累 得 都 不 能 睡觉。
Tā lèi de dōu bù néng shuìjiào.
he tired DEG even not able sleep
'He is so tired that he is even not able to sleep.'

b. 他 烦 得 我 都 不 想 再 听 了。
Tā fán de wǒ dōu bù xiǎng zài tīng le.
he annoy DEG me even not want again listen PFV
'He annoyed me to the degree that I didn't wish to listen anymore.'

Resultative complements

There are two possibilities to incorporate a resultative complement into a VP: compound formation and *de*-complementation. *De*-complementation has been described in the previous section. In resultative compounds, the resultative complement is directly appended to the verb:

(46) a. 他 跑-累 了。
Tā pǎo-lèi le.
he run-tired.RES PFV
'He ran to the extent of getting tired.'

b. 他 打-死 了 狗。
Tā dǎ-sǐ le gǒu.
he beat-dead.RES PFV dog
'He beat the dog to death.'

Chinese resultative structures have an underspecified argument distribution and are quite versatile in the linking options; in (46a), the resultative is predicated of the subject of the matrix verb, whereas in (46b), it is predicated of the object. Multiple readings are available in cases with symmetric selectional restrictions:

(47) 陶陶 追-累 了 悠悠 了。
Táotao zhuī-lèi le Yōuyou le.
Taotao chase-tired.RES PFV Youyou MOD
'Taotao chased Youyou and as a result, Youyou got tired.' or
'Taotao chased Youyou and as a result, Taotao got tired.' (Li, 1995, p. 256)

On the semantic side, a distinction can be made between resultatives with a purely "grammatical" semantics and resultatives that make a lexical contribution. Resultatives with a grammatical meaning serve to indicate some form of completion of the event and form a closed class; roughly, it contains the following elements: 完 *wán* ('to finish'), 到 *dào*, 好 *hǎo*, 得 *dé*, 着 *zhǎo* ('to succeed'). The following illustrates:

(48) a. 小李 把 作业 做-好 了。
Xiǎolǐ bǎ zuòyè zuò-hǎo le.
Xiaoli BA homework do-finish.RES PFV
'Xiaoli finished the homework.'

b. 老王 买-到 了 票。
Lǎowáng mǎidào le piào.
Laowang buy-succeed.RES ticket
'Laowang succeeded in buying a ticket.'

c. 他 看-完 了 文章。
Tā kàn-wán le wénzhāng.
he read-finish.RES PFV article
'He finished reading the article. '

The combination of "grammatical" resultatives with verbs is lexically restricted: most verbs cannot combine with the whole range of resultatives. For example, 好 *hǎo* mostly applies to events which describe the creation or transformation of an entity; it does not combine with verbs of consumption or destruction:

(49) 我 把 蛋糕 做/*吃-好 了。
Wǒ bǎ dàngāo zuò/*chī-hǎo le.
I BA cake make/eat-succeed.RES PFV
'I succeeded in making / eating the cake.'

Still, most verbs can combine with more than one of the elements:

(50) 我 把 信 写-好/完 了。
Wǒ bǎ xìn xiě-hǎo/wán le.
I BA letter write-succeed/finish.RES PFV
'I succeeded / finished writing the letter. '

The second semantic type are lexically contentful resultatives. These resultatives contribute an additional dimension and assert a change of state of their theme along this dimension. Naturally, this type of resultative comes with a greater flexibility of lexical combination:

(51) a. 阿明 把 衣服 洗-透明 了。
Āmíng bǎ yīfu xǐ-tòumíng le.
Aming BA clothes wash-transparent.RES PFV
'Aming washed the clothes until they got transparent.'

b. 他 把 茄子 片儿 炸-黄 了。
Tā bǎ qiēzi piànr zhá-huáng le.
he BA aubergine piece fry-yellow.RES PFV
'He fried the aubergines until they became yellow.'

As described in Section 1.2.1, many lexically contentful resultatives require the object to be preposed into preverbal position; this is frequently effected with

the *bǎ*-construction, which is one of the most common object preposing forms in Chinese and semantically overlaps with resultatives in its tendency to express bounded events.

Verb reduplication

Verb reduplication is a productive morphological process in Chinese; the reduplication form is AA for monosyllabic verbs and ABAB for bisyllabic verbs. Optionally, the morpheme 一 *yī* can be inserted between reduplicated monosyllabic verbs:

(52) a. 我 想 看-(一)-看 电视。
Wǒ xiǎng kàn-(yī)-kan diànshì.
I want watch-one-watch TV
'I want to watch a bit television.'

b. 我们 要 考虑-考虑 这 个 问题。
Wǒmen yào kǎolǜ-kǎolǜ zhè ge wèntí.
we must think-think this CLF matter
'We have to think a bit about this matter.'

Semantically, verb reduplication either marks "tentative" or delimitative aspect; it signals that the action happens "a little bit" (Li and Thompson, 1981a, p. 234).

Directional complements

Directional complements are morphemes that are appended to a verb and indicate the spatial or deictic orientation of the event described by the verb; some of the morphemes can also be used independently as main predicates. There are two closed classes of such morphemes:

- Non-deictic directionals: 进 *jìn* (‘move into’), 出 *chū* (‘move out’), 上 *shàng* (‘move up’, relative to external object), 下 *xià* (‘move down’), 回 *huí* (‘return’), 过 *guò* (‘pass by’), 起 *qǐ* (‘move up’, relative to agent of action)

- Deictic directionals: 来 *lái* (movement towards the speaker), 去 *qù* (movement away from the speaker)

The same instance of a verb may be complemented both with a deictic and a non-deictic complement; the “maximal” combination of elements in a motion predicate has the following order:

(53) main verb + nondeictic directional + deictic directional

Each “slot” in this chain can only be instantiated by one single element. The slots do not need to be filled; the following combinations are possible:

- main verb + nondeictic directional + deictic directional:

(54) 老王 跑-上-去 了.
Lǎowáng pǎo-shàng-qù le.
Laowang run-UP-FROM.HERE PFV
‘Laowang ran up.’

- nondeictic directional + deictic directional:

(55) 老王 上-去 了.
Lǎowáng shàng-qù le.
Laowang UP-FROM.HERE PFV
‘Laowang went (moved) up.’

- main verb + nondeictic directional, obligatorily followed by a goal NP:

(56) 老王　　跑-上　　*(楼梯).
Lǎowáng pǎo-shàng *(lóujī).
Laowang run-UP　　stairs
'Laowang ran up the stairs.'

- nondeictic directional, obligatorily followed by a goal NP:

(57) 老王　　上　　*(楼梯).
Lǎowáng shàng *(lóujī).
Laowang UP　　stairs
'Laowang moved up the stairs.'

We see that the position following the nondeictic directional may not be left empty; it has to be filled either by a deictic directional or a goal NP, which provides a bound to the path of the motion event. As generally recognized since Krifka (1989b), bounded paths entail the telicity of a motion event; thus, sentences containing directional complements describe telic events.

1.3 Summary

In this chapter, I have presented the basic syntactic and semantic characteristics of the *bǎ*-construction and placed it into the context of a range of other structures. Some of these structures alternate with the *bǎ*-construction, although they manifest differences in semantics, information structure and markedness; other structures are relevant because they frequently co-occur with the *bǎ*-construction and may be required to make a given predicate acceptable in the construction. So far, the exposition has touched upon uncontroversial and rather intuitive aspects of the *bǎ*-construction. The next chapter proceeds with a more detailed consideration

of the part-of-speech of *bǎ*, the semantic constraints on its use and the meaning of the construction.

Chapter 2

Previous studies of the *bǎ*-construction

2.1 Early studies

The early descriptions of the *bǎ*-construction in Modern Chinese (Wáng, 1943; Lǚ, 1948; Chao, 1968; Zhū, 1982) have identified some important points of debate. Thus, *bǎ* is treated as a preposition; Lǚ (1948) recognizes that the verb in the *bǎ*-construction may not be bare, and proposes a classification of 13 possible additional dependents. Since Wáng (1943), the meaning of the *bǎ*-construction is roughly characterized as disposal; however, since Lǚ (1948) it is assumed that disposal does not exhaustively account for all *bǎ*-sentences. Early research also recognizes that the *bǎ*-construction allows for different argument distributions (cf. Section 1.1); for example, Zhū identifies the following argument distributions besides the canonical form where the *bǎ*-NP corresponds to the patient of the verb:

- *bǎ*-NP as patient of main verb:

(58) 阿明　把 门　锁上　　了。
Āmíng bǎ mén suǒshàng le.
Aming BA door lock　　PFV
'Aming locked the door.'

- *bǎ*-NP as patient of whole predicate construction:

(59) 阿明　把 脚　走-大　　了。
Āmíng bǎ jiǎo zǒu-dà　　le.
Aming BA feet walk-big.RES PFV
'Aming walked until his feet became big.' (*idiom.*)

- *bǎ*-NP as subject of intransitive verb (agent for unergative, patient for unaccusative):

(60) a. Unergative:

保安　把 个　犯人　　跑　了。
Bàoān bǎ ge　fànrén　　pǎo le.
guard　BA CLF criminal run　PFV
'The guard let a criminal run away.'

b. Unaccusative:[1]

去年　　把 个　老王　　死 了。
Qùnián　bǎ ge　Lǎowáng sǐ　le.
last.year BA CLF Laowang die PFV
'We had Laowang die last year.'

[1]The presence of the classifier 个 *gè* in this example is pragmatically motivated. Phrases of the form (NP1) *bǎ ge* NP2 V_{intr} are rare in modern language use. For a more detailed description of *bǎ*-NPs with *gè*, the reader may refer to Shī (2006) and Zhāng (2009, Chapter 11).

Another concept that often recurs in the literature on the *bǎ*-construction is structural "substitutability" (变换性 *biànhuànxìng*): since the early studies, researchers have tried hard to find structures that could substitute or be substituted by the *bǎ*-construction; thus, Lǚ (1948) considers the *bǎ*-construction in relation to normal SVO sentences, whereas Zhū (1982) establishes a relation with unaccusative sentences. This procedure is problematic: indeed, most *bǎ*-constructions have structural "counterparts"; however, these almost always come with a meaning variation on the pragmatic and often also on the truth-conditional level (cf. Zhāng 2009, *i. a.*). For example, a *bǎ*-construction with an affectedness verb implies total affectedness, whereas the SVO counterpart, while also implying affectedness, does not quantify it:

(61) a. 他 喝 了 酒。
Tā hē le jiǔ.
he drink PFV wine
'He drank wine.'

b. 他 把 酒 喝 了。
Tā bǎ jiǔ hē le.
he BA wine drink PFV wine
'He drank the wine up.'

On the basis of these early studies and claims, subsequent research has raised numerous questions concerning both the syntactic structure and the meaning of the *bǎ*-construction; unfortunately, there has been less research about the interplay between syntax and semantics. Native linguists exploit the frameworks of Cognitive Grammar (Langacker, 1987; Talmy, 2000) and Construction Grammar (Goldberg, 1995) to formulate semantic descriptions of the construction (Guō, 2003; Zhāng, 2009; Shī, 2010, *i. a.*). On the other hand, syntactic treatments remain rather sketchy about the semantics of the construction. In the following, I

first summarize the discussion around the syntactic status of *bǎ* and then present the semantic analyses.

2.2 The syntactic status of *bǎ*

The general wisdom in descriptive lingusitics is that *bǎ* is a preposition; this is the "null hypothesis" adopted in Chinese textbooks, grammars etc. The theoretical discussion is more controversial: *bǎ* has been analyzed as verb, light verb, preposition and case marker – thus, there are four part of speech hypotheses which cover the main stages on the grammaticalization cline from verb to a functional item.

2.2.1 *Bǎ* as a verb

The analysis of *bǎ* as a full lexical verb has been adopted by Hashimoto (1971), Ross (1991), Yang (1995) and Bender (2000). This view is attractive given the original verbal status of *bǎ*. It can be argued that *bǎ* has undergone a process of semantic bleaching which changed its meaning to a more abstract one without changing its syntactic category. The original verbal status of *bǎ* is still visible in questions as the following, which have the pattern of a serial verb construction:

(62) 你 把 橘子 怎么样 了?
Nǐ bǎ júzi zěnmeyàng le?
you BA orange how PFV
'What did you do to the orange?' ('How did you proceed with the orange?')

Besides, *bǎ* retains its verbal status in a very limited range of almost lexicalized verb-object combinations, such as 把门 *bǎ mén* ('guard the door').

One important argument for *bǎ* being a verb is its ability to create additional argument positions. As shown in Section 1.1, there are instances of the *bǎ*-construction whose argument structure cannot be resolved in terms of the arguments of the lexical predicate; the surface NPs cannot be distributed among the argument positions of the verb:

(63) a. Causative sentences:

这 件 事 把 他 哭-累 了。
Zhè jiàn shì bǎ tā kū-lèi le.
this CLF affair BA he cry-tired.RES PFV

'This affair made him cry to the extent of becoming tired.'

b. Retained object sentences:

他 把 橘子 拨 了 皮。
Tā bǎ *jùzi* bō le pí.
he BA orange peel PFV skin

'He peeled the peel off the orange.'

c. Resultative NP sentences:

他 把 衣服 包 了 一 个 小包。
Tā bǎ *yīfu* bāo le yī ge xiǎobāo.
he BǍ clothes pack PFV one CLF small.package

'He packed the clothes into a small package.'

These cases suggest that *bǎ* has its own argument structure. Further, since the additional arguments are semantically related to the events described by the lexical predicate, the argument structure of *bǎ* seems to compose with the argument structure of the lexical predicate.

Arguing for the verbal status of *bǎ*, Bender (2000) provides a further structural argument from long-distance dependencies:

(64) 你 赶快 把 这 件 事 找 人 告诉 李四。
Nǐ gǎnkuài bǎ zhè jiàn shì zhǎo rén gàosu Lǐsī!
you quick BǍ this CLF affair find people tell Lisi
'You should quickly find somebody to tell Lisi about this affair!'

The object of *bǎ* corresponds to the semantic object of a verb that is embedded under the main lexical verb (告诉 *gàosu* 'tell'). The sentence-second position of the *bǎ*-NP is difficult to explain if *bǎ* is assumed to form a constituent with its NP: in Chinese, elements that are placed in the position between subject and verb do not participate in long distance dependencies. Consider the following SOV structure:

(65) a. 他 功课 已经 做-完 了。
Tā gōngkè yǐjīng zuò-wán le.
he homework already finish PFV
'He has already finished his homework.'

b. * 我 功课 觉得 他 已经 做-完 了。
Wǒ gōngkè juéde tā yǐjīng zuò-wán le.
I homework think he already finish PFV
'The homework, I think he already finished it.'

The verb whose object is preposed cannot be further embedded. However, the long distance dependency with *bǎ* is expected when *bǎ* is analyzed as a verb. This argument is weakened by the fact that long-distance dependencies in the *bǎ*-construction are only productive in a limited range.

Finally, *bǎ* behaves like a verb with respect to the class of "nonmovable" adverbs (Li and Thompson, 1981a, p. 322–340); this class includes manner adverbs as well as the adverbs 也 *yě* ('also'), 都 *dōu* ('all'), 再 *zài* ('again') etc. Normally, the only possible position for these adverbs is the immediate preverbal position:

(66) 我们 都 吃 了 苹果。
Wǒmen dōu chī le píngguǒ.
we all eat PFV apple
'We all ate apples.'

They may not occur before the sentence-second topic position:

(67) * 我们 都 苹果 吃 了。
Wǒmen dōu píngguǒ chī le.
we all apples eat PFV
'We all ate apples.'

However, they appear before *bǎ*:

(68) 我们 都 把 苹果 吃 了。
Wǒmen dōu bǎ píngguǒ chī le.
we all BA apples eat PFV
'We all ate the apples.'

In the following, I describe the analysis of *bǎ* as a verb proposed by Bender (2000) in the LFG framework. A major issue targeted by the analysis is the explanation of *bǎ*-clauses with "retained objects":

(69) 他 把 橘子 波 了 皮。
Tā bǎ júzi bō le *pí*.
he BA orange peel PFV skin
'He peeled the peel off the orange.'

Bender formulates the following lexical entry for *bǎ*:

(70) *bǎ* V (↑ PRED) = 'ba <(↑ SUBJ)(↑ OBJ)(↑ COMP)>'
(↑ OBJ) = (↑ COMP TOPIC)

Bǎ selects for a subject, an object and a predicative complement; in order to capture the "topical" character of the *bǎ*-NP, the object is identified with the topic

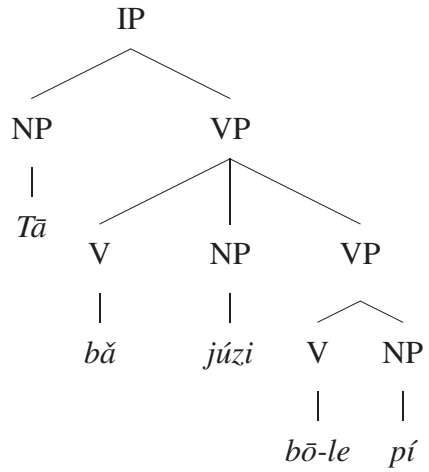
of the complement. The semantic characterization of *bǎ* is reminiscent of the original disposal analysis as proposed by Wáng (1943):

(71) (↑ SUBJ) is responsible for the fact that (↑ OBJ) turns out as (↑ COMP) describes.

The functional and constituent structures of *bǎ* are as follows:

(72) a. f_1:
$$\begin{bmatrix} \text{PRED} & \text{`}bǎ\text{<}(f_1\ \text{subj})(f_1\ \text{obj})(f_1\ \text{comp})\text{>`} \\ \text{SUBJ} & \text{`3sg`} \\ \text{OBJ} & \boxed{\text{A}}\text{`orange`} \\ \text{COMP}\ f_2\text{:} & \begin{bmatrix} \text{PRED} & \text{`peel<}(f_2\ \text{subj})(f_2\ \text{obj})\text{>`} \\ \text{SUBJ} & [\ldots] \\ \text{OBJ} & \text{`peel`} \\ \text{TOPIC} & \boxed{\text{A}} \end{bmatrix} \end{bmatrix}$$

b.



Bǎ heads the matrix VP: it is the outermost predicate in the structure and selects for a subject, an object and a complement. The complement is specified as selecting for a subject and an object. The topic of the complement VP is identified with the object of *bǎ* by functional control.[2]

[2]Functional control is defined by the *Extended Coherence Condition*, specified as follows:

All functions in f-structure must be bound:

Counterarguments to the verb analysis

An obvious and frequently cited counterargument to the verb analysis is that *bǎ* does not pass the three standard tests for verbhood in Chinese, namely aspect marking, the use in V-not-V questions and the ability to form a simple answer:

1. Verbs, but not *bǎ* can be marked for aspect:

   (73) 我们 吃 了 苹果。
   Wǒmen chī *le* píngguǒ.
   we eat PFV apple
   'We ate apples.'

   (74) *我们 把 了 苹果 吃。
   Wǒmen bǎ *le* píngguǒ chī.
   we BA PFV apple eat
   'We ate apples.' (*intended*)

2. Verbs, but not *bǎ* can be used in *yes-no*-questions with a V-not-V sequence:

   (75) 你 吃 不 吃 苹果?
   Nǐ chī bù chī píngguǒ?
   you eat not eat apples
   'Do you eat apples?'

   (76) *你 把 不 把 苹果 吃?
   Nǐ bǎ bù bǎ píngguǒ chī?
   you BA not BA apples eat
   'Do you eat apples?' (*intended*)

- An argument is bound by being argument of predicator.
- An adjunct is bound by occurring in an f-structure that contains a predicate.
- A topic or focus is bound by functional identification or anaphoric binding by a bound function.

The topic must be bound either by being an argument of a predicate or by being an adjunct.

3. Verbs, but not *bǎ* can be used in simple answers to questions:

(77) - 你 吃 了 苹果 吗?
- Nǐ chī le píngguǒ ma?
you eat PFV apples INTERR
'Do you eat apples?'

- 吃 了。/ 没 吃。
- Chī le. / Méi chī.
eat PFV / NEG.PFV eat

'Yes./No.'

(78) - 你 把 苹果 吃 了 吗?
- Nǐ bǎ píngguǒ chī le ma?
you BA apples eat PFV INTERR
'Do you eat apples?'

*- 把 了。/ 没 把。
- Bǎ le. / Méi bǎ.
BA PFV / NEG.PFV BA

'Yes./No.'

A second counterargument comes from complement extraction (Sun, 1996; Gao, 2000): VPs allow for complement extraction by means of topicalization, relativization, long distance dependencies etc., whereas PPs do not. The extraction of the *bǎ*-complement was possible until the 18th century:

(79) 更 须 把 来 看
gèng xū *bǎ* lái kàn
more need take FUT read
'even more necessary to read (it)' (Sun, 1996, p. 80)

By contrast, the *bǎ*-NP has to be overtly realized in Modern Chinese; thus, *bǎ* behaves more like a preposition in this respect.

These two arguments are based on characteristic properties of verbs. However, they operate with sufficient, but not necessary conditions for verbhood. As demonstrated by Tai (1982), the verbhood tests do not universally apply in Chinese–a number of items that are unequivocally considered as verbs do not pass these tests:

1. 是 *shì* ('to be') does not allow for aspect marking:

(80) * 他 是 了 学生。
Tā shì le xuésheng.
he be PFV student
'He was a student.'

2. 认为 *rènwéi* ('to believe') does not allow for V-not-V-questions:

(81) * 你 认为 不 认为 他 是 学生?
Nǐ rènwéi bù rènwéi tā shì xuésheng?
you believe NEG believe he be student
'Do you believe that he is a student?'

3. 以为 *yǐwéi* ('to believe mistakenly') cannot be used as simple answer:

(82) - 你 以为 他 是 学生 吗?
- Nǐ yǐwéi tā shì xuésheng ma?
you believe he be student INTERR
'Did you believe that he was a student?'

*- 以为。/ 不 以为。
- Yǐwéi. / Bù yǐwéi.
believe / not believe
'Yes. / No.'

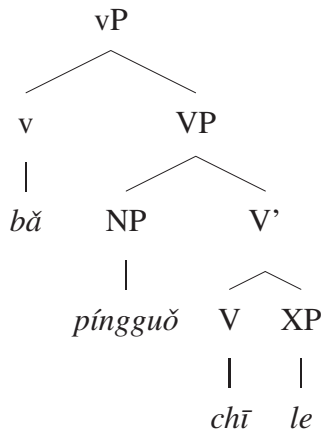
Similarly, the complement extraction argument is weakened by the fact that modal verbs also do not allow for NP extraction:

(83) a. 我 喜欢 / 会 游泳。
Wǒ xǐhuān / huì yǒuyǒng.
I like / able swim
'I like / am able to swim.'

b. 游泳, 我 喜欢 / *会.
Yǒuyǒng, wǒ xǐhuān / *huì.
swim I like able
'I like / am able to swim.'

2.2.2 *Bǎ* as a light verb

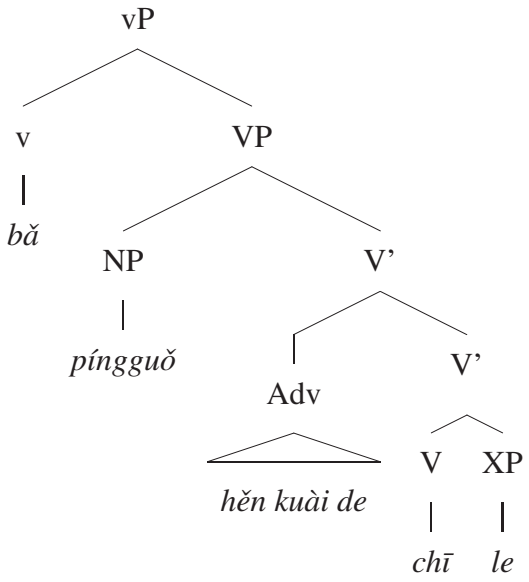
Generally, a light verb is an element that forms a complex predicate with a lexical head (V/N) and determines some event-structural properties, such as voice and aspect, of the clause which is headed by this lexical element. Examples for light verbs in English are *take* (*a nap, a shower*) and *have* (*breakfast, coffee*). Chinese does not have a well-established category of light verbs; thus, an analysis of *bǎ* as a light verb does not require commitment with respect to the empirical properties that it should have in Chinese. The light verb analysis as proposed by Li (2001) and Huang et al. (2009) is based on a Larsonian shell structure (Larson, 1988). The shell structure is also used by Huang (1992), who postulates the following deep structure for a shell which can be instantiated with a VP or a *bǎ*-construction:



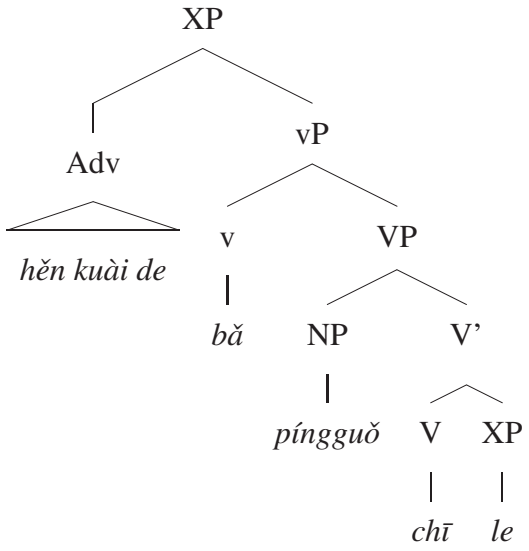
The v can be filled either by raising of V, which results in the SVO order, or by insertion of *bǎ*.

Li (2001) and Huang et al. (2009) point out that the assumption of this structure for both types of sentences makes wrong predictions about the placement of adverbs. In the *bǎ*-construction, there are two adverb positions (see Section 1.1): the adverb may be adjoined either to vP or to V':

(84) 他把 苹果 很 快 地 吃 了。
Tā bǎ píngguǒ *hěn kuài de* chī le.
he BA apple very quick ADV eat PFV
'He ate the apple(s) very quickly.'



(85) 他很 快 地 把 苹果 吃 了。
Tā *hěn kuài de* bǎ píngguǒ chī le.
he very quick ADV BA apple eat PFV
'He ate the apple(s) very quickly.'



By contrast, only the position before the verb is available in SVO sentences:

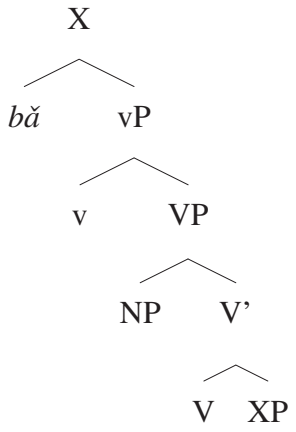
(86) a. 他很 快 地 吃了 苹果。
Tā *hěn* *kuài* *de* chī le píngguǒ.
he very quick ADV eat PFV apple

'He ate the apple(s) very quickly.'

b. * 他吃了 苹果 很 快 地。
Tā chī le píngguǒ *hěn* *kuài* *de*.
he eat PFV apple very quick ADV

'He ate the apple(s) very quickly.'

In order to rule out (86b), the authors alter the structure for the *bǎ*-construction: *bǎ* is inserted in a position higher than *v*:



2.2.3 *Bǎ* as preposition

In the Chinese descriptive tradition, *bǎ* has been rather unequivocally categorized as a preposition. The preposition analysis has been adopted by Chao (1968), Travis (1984), Li (1990), Sun (1996) and Gao (2000); Bisang (1992) treats *bǎ* as a coverb, thus explicitly asserting its intermediary position on the verb-preposition cline.

In Section 2.2, we have seen that *bǎ* behaves more like a preposition with respect to complement extraction. Another argument comes from coordination with the conjunction 又 *yòu* (Li, 1990, p. 189). *Yòu* may normally only coordinate constituents of the same syntactic category:

(87) 他 又 打工 又 读书。
Tā yòu dǎgōng yòu dúshū.
he also work also study
'He works and studies (at the same time).'

(88) * 他 又 打工 又 他 读书。
Tā yòu dǎgōng yòu tā dúshū.
he also work also he study
'He works and studies (at the same time).'

By contrast, the *bǎ* + NP sequence can be coordinated with a PP:

(89) 你 又 [为 他] 又 [把 他] 借 钱, 这 是 什么 意思?
Nǐ yòu [*wéi* tā] yòu [*bǎ* tā] jiè qián, zhè shì shénme yìsi?
you also for he also BA he borrow money this be what meaning
'You borrow money both for and from him, how does this make sense?'

(Bender, 2000)

A counterargument against the preposition status comes from the placement of negation particles and modal verbs; in sentences with these elements, *bǎ* behaves differently from prepositions. Negators and auxiliaries can appear in two positions in sentences with preverbal PPs:

(90) a. 他 没 在 食堂 吃饭。
Tā méi zài shítáng chīfàn.
he NEG.PFV at dining.hall eat
'He didn't eat at the dining hall.'

b. 他 在 食堂 没 吃饭。
Tā zài shítáng méi chīfàn.
he at dining.hall NEG.PFV eat
'He didn't eat at the dining hall.'

(91) a. 他 可以 在 食堂 吃饭。
Tā kěyǐ zài shítáng chīfàn.
he can at dining.hall eat
'He can eat at the dining hall.'

b. 他 在 食堂 可以 吃饭。
Tā zài shítáng kěyǐ chīfàn.
he at dining.hall can eat
'He can eat at the dining hall.'

Thus, the negation or modal verb can occur either before the PP or before the verb:

(92) a. NP neg/aux PP VP

b. NP PP neg/aux VP

On the other hand, only the position before *bǎ* is available in *bǎ*-sentences:

(93) a. 他 没 / 会 把 苹果 吃-完。
Tā méi / huì bǎ píngguǒ chī-wán.
he NEG / can BA apple eat-finish
'He didn't / can eat up the apples.'

b. * 他 把 苹果 没 / 会 吃-完。
Tā bǎ píngguǒ méi / huì chīwán.
he BA apple NEG / can eat.up
'He didn't / can eat up the apples.'

2.3 The meaning of the *bǎ*-construction

2.3.1 Preliminary remarks

Some methodological remarks are in order before I present the work on the semantics of *bǎ*. First, as noted by Shī (2010), many analyses isolate the *bǎ*-construction from the overall system of the Chinese language; they fail to clearly separate the constraints and meaning components which are tied to the use of *bǎ* from those that are conditioned by other components of the sentence. There are mainly three independent sources of meaning which are often confused with the semantic import of *bǎ*: lexical semantics, grammatical structures that frequently co-occur with the *bǎ*-construction, and general principles of constituent order and information packaging.

The semantics of the lexical predicate in a *bǎ*-construction often expresses disposal and affectedness:

(94) 我 把 苹果 吃 了。
Wǒ bǎ píngguǒ *chī* le.
we BA apple(s) eat PFV
'I ate the apple(s).'

Few analyses that use these notions attempt to explain those cases where disposal is not lexically expressed. One such analysis is Shěn (2002) (see Section 2.3.2), who uses the notion of "subjective" disposal and integrates epistemic aspects; Shēns analysis clearly shows that the *bǎ*-construction cannot be fully explained in terms of truth-conditional entailments.

Second, the additional verbal dependent constraint (see Section 1.1) says that the verb in the *bǎ*-construction must be complemented by an additional element. Some types of complements – in particular resultative structures – are very frequent; as noted by Jiǎng (1997) and Shěn (2002), the conclusion that the *bǎ*-construction expresses causativity and/or resultativity is misleading. *Bǎ* might have a purely syntactic function of "freeing" the postverbal position for the resultative. Besides, the preposing of the object NP into a more prominent position seems pragmatically natural because this NP is the subject of the resultative and, thus, is associated with more semantic content than a simple object NP (cf. also Song (2006) on obligatory object preposing with focussed resultatives).

Finally, some claims concerning the semantics of the *bǎ*-NP stem from general word order principles that impact onto NP semantics. Thus, one principle states that preverbal NPs tend to be definite or specific, whereas postverbal NPs tend to be non-specific (Chao, 1968; Zhū, 1982); referential specificity is often used as a constraint on the *bǎ*-NP. Similarly, a general principle of information organization says that given information precedes new information (Givon, 1984; Lambrecht,

1994; Halliday, 1967); the givenness property correlates with the topic character of the *bǎ*-NP that has been pointed out in some studies (Bender, 2000; Hsueh, 1989).

In order to eliminate the above conclusions, Shī (2010) explicitly considers the *bǎ*-construction in the context of semantically similar structures and focusses on the distinctive features of these structures. He recognizes that the long-standing descriptions of the *bǎ*-construction in terms of disposal and causation are not fine-grained enough in order to provide a precise characterization of the construction; thus, besides SVO sentences which express disposal once they are instantiated with an appropriate predicate, the *bèi*-construction grammatically conveys disposal. Causation is entailed by any sentence that is instantiated with a resultative predicate. Being aware of these semantic parallels, Shī differentiates these structures at the pragmatic level. He compares the *bǎ*-construction with SVO sentences that lexically encode disposal and finds that the *bǎ*-construction puts the focus on the result of the disposal action. The difference between the *bǎ*-construction and *bèi*-construction mainly pertains to different relative degrees of topicality for the participants: in the *bèi*-construction, the patient of the disposal action is more topical; in the *bǎ*-construction, the subject still retains its primary topic status.

In the following, I first describe the constraints the on lexical semantics of the *bǎ*-construction as well as on the referential properties of the *bǎ*-NP. In a second step, I show how the semantic contribution of the *bǎ*-construction has been analyzed. The semantic import of *bǎ* is directly visible in syntax in those cases where it enriches the argument structure of the sentence. It is more volatile if the argument structure of the sentence is determined by the lexical predicate; in these cases, *bǎ* has been explained in terms of subjectification, epistemic modality and emphasis on subevents or event participants.

2.3.2 Semantic constraints on the use of *bǎ*

Disposal, affectedness and causation

The first influential semantic characterization of the *bǎ*-construction in Modern Chinese stems from Wáng (1943); Wáng states that the *bǎ*-construction expresses disposal (处致 *chǔzhì*). Thus, the *bǎ*-construction was named "disposal construction" (处致试 *chǔzhìshì*) until Lǚ (1948), who recognized that disposal does not account for all *bǎ*-constructions. The notion of disposal has been used subsequently by Pān (1981), Sòng (1979, 1981), Hsueh (1989) and Shěn (2002). "Disposal" is a correlate of the more familiar notion of "affectedness": disposal is the agent-oriented, whereas affectedness is the patient-oriented side of an action that can be described as "force transmission". In terms of disposal, the meaning of the *bǎ*-construction is roughly characterized as follows:

(95) a. A *bǎ* B C

b. A disposes of B in the way described by C.

Zhāng (2009) aligns the disposal meaning of the *bǎ*-construction with general principles of cognitive organization. First, the *bǎ*-construction iconically reflects the temporal properties of the participants that are involved in a disposal event: the driving force (subject) must be realized before the predicate; the entity that is disposed of must exist before the event takes place, which is signalled by its preverbal position. Second, *bǎ* marks the target of disposal. The position of the affectee between *bǎ* and the predicate emphasizes the effect of the disposal action; in cases where a distinction between partial and total affectedness can be made, the use of *bǎ* enforces the stronger reading of total affectedness. According to the author, this again pertains to iconicity: the closer the object is to the verb, the easier and the stronger it can be affected by the action; however, the author does not explain the difference between the *bǎ*-construction and a normal SVO structure in

which the object is just as close to the verb. Finally, the additional verbal complement constraint (s. Section 1.1) forces the use of a "heavy" predicate; it holds because simple verbs do not sufficiently specify the disposal action. By contrast, the obligatory additional complements "elaborate" on the disposal meaning (cf. also Li and Thompson 1981a): they denote a process in which the disposal action of the subject is paired with the affectedness event on part of the object.

Disposal probably accounts for the majority of *bǎ*-constructions; however, as expected, *bǎ*-constructions in which the lexical predicate does not express diposal do not express truth-conditional disposal either:

(96) a. 老王 把 小李 看 了 一 眼。
Lǎowáng bǎ Xiǎolǐ kàn le yī yǎn.
Laowang BA Xiaoli look PFV one glimpse
'Laowang caught a glimpse of Xiaoli.'

b. 老王 把 个 好 机会 错过 了。
Lǎowàng bǎ ge hǎo jīhuì cuòguò le.
Laowang BA CLF good opportunity miss PFV
'Laowang missed a good opportunity.'

Nevertheless, the disposal notion is a good intuitive starting point for a semantic description of the *bǎ*-construction. A related notion that has been explored is causation (使致 *shǐzhì*), which is treated as a supertype of disposal (Guō, 2003). The causation analysis has been proposed by Sybesma (1999), Li (2003) and Guō (2003), *i. a.* The authors assume causative situations that are composed of two subevents–a caused and a causing event; these two simple events are connected by a causative relation. The following illustrates:

(97) 阿明 把 衣服 洗-干净 了。
Āmíng bǎ yīfu xǐ-gānjìng le.
Aming BA clothes wash-clean.RES PFV
'Aming washed the clothes clean.'

The semantics can be described as follows:

(98) $\exists e_1 \exists e_2 (wash(e_1, \textbf{Aming}, \textbf{clothes}) \wedge become(e_2, proper(\textbf{clothes})) \wedge cause(e_1, e_2))$

As noted in the introduction, the constructions that grammaticalize causative events in Chinese – resultative compounds and *de*-resultatives (see Section 1.2) – frequently cooccur with the *bǎ*-construction; such sentences get a causative meaning independently of the use of *bǎ*. Guō (2003) explicitly extends the causation analysis to cases without resultative structures, arguing that they also have a causative meaning. He distinguishes two types of the *bǎ*-construction: the "analytic" and the "synthetic" *bǎ*-construction. In the analytic *bǎ*-construction, both subevents in the causative situation are overtly expressed; this is the kind of *bǎ*-construction presented in (97). By contrast, the synthetic *bǎ*-construction specifies only one subevent; the other subevent is left implicit. In the following two examples, the caused event is left unspecified:

(99) a. 老王 把 衣服 洗 了。
Lǎowáng bǎ yīfu xǐ le.
Laowang BA clothes wash PFV
'Laowang washed the clothes.'

b. 小李 把 钱 抽 了 烟。
Xiǎolǐ bǎ qián chōu le yán.
Xiaoli BA money smoke- PFV -smoke
'Xiaoli spent all his money on smoking.'

The author assumes that the verbs are either inherently causative or get a causative meaning from context. In (99a), the clean state of the clothes is a natural result of the washing event. In (99b), smoking does not lexically imply some change of state of money. The sentence is presented in an isolated context, and

the verb does not have an inherent causative meaning. The author claims that our world knowledge leads us to the inference that smoking implies the spending of money; thus, the decrease in the amount of money possessed by the subject is interpreted as caused event.

In the following example, the causing event is left implicit:

(100) 老王　　把 问题　　复杂化　　了。
Lǎowáng bǎ wèntí　　fùzáhuà　　le.
Laowang BA problem complicate PFV
'Laowang made the problem more complicated.'

Only the caused event – namely, the problem becoming more complicated – is lexically expressed. The means by which the causer achieved this result are left underspecified.

Aspectual boundedness

Aspectual accounts have been proposed in terms of viewpoint, situation type as well as the crosscategorial notion of boundedness. Mei (1978), Hopper and Thompson (1980) and Szeto (1988) have analyzed the *bǎ*-construction as a perfective construction. Thus, Mei isolates the class of verbs that are compatible with the perfective aspect marker *le* and claims that these verbs can also be used in the *bǎ*-construction. In their transitivity-based account, Hopper and Thompson consider perfectivity as an "ingredient" of transitivity; thus, perfectivity correlates with the high transitivity of the *bǎ*-construction. Szeto equals perfectivity with temporal boundedness which, in turn, licenses the *bǎ*-construction. Perfectivity does not fully explain the data; it is most obviously challenged by sentences with manner adverbs which underspecify the viewpoint value of the event:

(101) 他把字　　写　得　很　大。
Tā bǎ zì　　xiě　de　hěn　dà.
he BA character write ATTR very big
'He writes very big characters.'

Yong (1993) proposes a characterization of the *bǎ*-construction in terms of situation type; he uses the classification of situation types for Chinese verbs proposed by Chen (1988).[3] Yong's generalization is that the *bǎ*-construction can be used with accomplishments, simple and complex changes; it does not occur with states and activities. Misfortunately, Yong mixes up viewpoint and situation type categories: he views V-*le/zhe* combinations as accomplishments; actually, they are manifestations of the perfective viewpoint. Thus, situation type alone is not sufficient to constrain the *bǎ*-construction.

Finally, Liu (1997a) proposes an explanation based on the notion of boundedness; boundedness transcends the two aspectual domains of viewpoint and situation type. Liu defines boundedness as a property of events that are described by predicates whose meaning includes an endpoint.Under this definition, an event can be bound in two ways: by the situation type of an uninflected predicate (telicity) or by the presentation of the situation in an appropriate viewpoint (atelic situation in perfective viewpoint). A bounded situation is a situation without internal stages that are static or can be viewed as such. In terms of viewpoint, the aspect markers

[3]Modifying Vendler's classification (Vendler 1957, cf. also Section 4.1), Chen distinguishes five situation types, characterized by the properties stativity, durativity and telicity:

Situation type	Stative	Durative	Telic
State	+	+	–
Activity	–	+	–
Accomplishment	–	+	+
Complex change	–	–	+
Simple change	–	–	–

了 *le* and 着 *zhe* can temporally bound the event. [4]

The boundedness constraint on the predicate is accompanied by a specificity constraint on the *bǎ*-NP. In line with Krifka's explanation of telicity as a homomorphism between the denotation of a specific NP and of the temporal course of the events (Krifka 1989b, 1998, cf. also Section 4.2.2), Liu states that the *bǎ*-construction is licensed by a homomorphism between the *bǎ*-NP and the bounded predicate.

Huang et al. (2009) provide a range of counterexamples to the boundedness criterion; on the one hand, not all *bǎ*-constructions are aspectually bounded:

(102) a. 他 正在 把 东西 往 屋里 搬。
Tā zhèngzài bǎ dōngxi wǎng wūlǐ bàn.
he PROG BA stuff toward room move
'He is moving the stuff toward the room.'

b. 你 不 把 他们 存细 地 深问, 怎 会 查出 问题?
Nǐ bù bǎ tāmen cúnxì de shēnwèn, zěn huì cháchū wèntí?
you not BA they detailed ADV question how can find.out problem
'How can you localize the problem if you don't ask them detailed questions?'

[4] 着 *zhe* licenses *bǎ* if the event is presented in irrealis mode:

(i) 请 你 把 护照 带 着。
Qǐng nǐ bǎ hūzhào dài *zhe*.
please you BA passport bring ZHE
'Please bring your passport with you.'

On the other hand, bounded events are not always acceptable in *bǎ*-construction:

(103) a. * 我 把 这 瓶 酒 喝-醉 了。
Wǒ bǎ zhè píng jiǔ hē-zuì le.
me BA this CLF wine drink-drunk.RES PFV
'I got drunk from drinking this bottle of wine.'

b. * 我 把 球赛 参加 了。
Wǒ bǎ qiúsài cānjiā le.
me BA match participate PFV
'I participated in the match.'

c. * 阿明 把 我 的 命令 服从 了。
Āmíng bǎ wǒ de mìnglìng fùcóng le.
Aming BA me ATTR order obey PFV
'Aming obeyed my order.'

Transitivity

A number of authors have recognized that the predicate in the *bǎ*-construction is often characterized by high transitivity (Hopper and Thompson, 1980; Li and Thompson, 1981b; Sun, 1996; Lipenkova, 2011; Tai, 1984). Most analyses are based on the approach to transitivity proposed in Hopper and Thompson (1980), where transitivity is analyzed as a gradient notion that is determined based on ten parameters (see Section 4.1 for an overview). Applying this theory to the *bǎ*-construction, the idea of a high transitivity meaning can be tested in two ways: on the one hand, the choice of the verb may make an acceptability contrast:

(104) 他 把 苹果 吃 / *看 了。
Tā bǎ píngguǒ chī / *kàn le.
he BA apple eat / look PFV
'He ate / looked at the apple.'

The meanings of the two verbs contain the following components that signal high transitivity:

- 吃 *chī* ('eat'): two participants, action, affirmation, telicity, volitionality, realis mode, agentivity, affectedness
- 看 *kàn* ('look'): two participants, action, affirmation, realis mode

Thus, 吃 *chī* expresses a higher transitivity then 看 *kàn*, which explains the acceptability contrast in (104).

On the other hand, an acceptability contrast may appear when an otherwise unacceptable verb is combined with an additional transitivity-enforcing element (Lipenkova, 2011):

(105) a. * 他 把 苹果 看 了。
Tā bǎ píngguǒ kàn le.
he BA apple look PFV
'He looked at the apple.'

b. 他 把 苹果 看 了 一眼。
Tā bǎ píngguǒ kàn le yīyǎn.
he BA apple look PFV one.glimpse
'He caught a glimpse of the apple.'

Here, the additional duration adverb 一眼 *yīyǎn* contributes punctuality and telicity, thus increasing the transitivity value of the whole sentence and making the predicate acceptable in the *bǎ*-construction.

The transitivity analysis is based on weak evidence: it is difficult to prove that the acceptability contrast arises by virtue of stonger semantic transitivity and is not the effect of some other independent features of the verbs / additional dependents. Indeed, some acceptability contrasts cannot be explained by different transitivity degrees:

(106) a. *他把这件事　　想　了。
Tā bǎ zhè jiàn shì　　xiǎng le.
he BA this CLF matter think PFV
'He thought about this matter.'

b. 他把这件事　　想　得　太悲观　　了。
Tā bǎ zhè jiàn shì　　xiǎng de　*tài bēiguān*　le.
he BA this CLF matter think DEG too pessimistic PFV
'He thought *too pessimistically* about this matter.'

Why is it that the sentence becomes acceptable once the manner adverb *tài bēiguān* is added? The transitivity hypothesis does not cover this acceptability contrast since the adverb does not impact on the transitivity degree as defined by the criteria of Hopper and Thomson.

Semantic properties of the NPs in the *bǎ*-construction

Zhāng (2009) considers the property clusters proposed in Dowty (1991) for the characterization of proto-agents and proto-patients (see 3.1 for an overview). However, instead of using the properties to characterize arguments of lexical verbs, he uses them to characterize syntactic positions. He makes two claims:

1. Preverbal constituents must have agent properties.

2. Postverbal nominal constituents must have patient properties.

The first claim is relevant for the *bǎ*-construction: on the one hand, it ascribes agent properties to an argument which is more often than not an object. On the other hand, it seems to conflict with the characterizations of the *bǎ*-construction in terms of high transitivity and affectedness, which presume that the *bǎ*-NP is a typical patient. Nevertheless, the author finds that the patient in the *bǎ*-construction

manifests two agent properties, namely existence independently of the event and movement.

The entity denoted by the *bǎ*-NP is already "on stage" before the event. Thus, the *bǎ*-construction prohibits events in which the *bǎ*-NP appears by virtue of the described event:

(107) a. 他 把 大衣 拖 / *穿 了。
Tā bǎ dàyī tuō / *chuān le.
he BA coat take.off put.on PFV
'He took the coat off / put the coat on.'

b. 我 把 房子 拆 / *盖 了。
Wǒ bǎ fángzi chāi / *gài le.
me BA house demolish build PFV
'I demolished / built the house.'

In example (107a), 拖 tuō ('take of') presupposes that the coat is already worn by someone; thus, it is "on stage". By contrast, 穿 chuān ('put on') only would cause the coat to come on stage and is unacceptable.

The explanation seems to exclude verbs of creation. However, Zhāng (2009) points out another way in which the *bǎ*-NP entity may "exist" previously to the event. Consider the following two examples:

(108) a. * 他 把 文章 写 了。
Tā bǎ wénzhāng xiě le.
he BA essay write PFV
'He wrote the essay.'

b. 他 是 一 位 有 才华 的 作家，能 把 文章 写
Tā shì yī wèi yǒu cáihuà de zuòjiā, néng bǎ wénzhāng xiě
he be one CLF have talent ATTR writer can BA essay write
得 引人入胜。
de yǐnrénrùshèng.
DEG fascinating
'He is a talented writer and is able to write fascinating essays.'

(Zhāng, 2009, p. 94)

'Writing essays' is not acceptable in an isolated context; however, with the context provided in (b), it becomes acceptable. Zhāng explains this as follows: the clause is in irrealis mode and describes not a specific event, but a generic activity ("the writer writing essays"). Thus, the *bǎ*-NP denotes not a physical, but a conceptual entity that exists only in the mind of the speaker.

Movement is the second agent property of the *bǎ*-NP; the denoted entity often undergoes direct movement:

(109) 阿明 把 书 放 在 桌-上。
Āmíng bǎ shū fàng zài zhuō-shàng.
Aming BA book put on table-on.LOC
'Aming put the book onto the table.'

Zhāng uses metaphorical extension to apply this criterion to examples which do not literally express movement. Thus, the domain of space, which includes movement through space, is the basis for the cognitive domain of time: many spatial notions are carried over into the temporal domain (cf. Talmy 2000). The *bǎ*-construction is often found with directional complements that, by metaphorical extension, pertain to temporal instead of spatial movement:

(110) 老师 把 课 讲-下去。
Lǎoshī bǎ kè jiǎng-xiàqù.
teacher BA class speak-CONTINUE
'The teacher went on with the class.'

Finally, Zhāng uses movement to explain *bǎ*-constructions that do not explicitly describe change of location or temporal progress, but express change by virtue of the lexical meaning of the verb or its additional dependents. This is reminiscent of the localist approach to argument realization, which conceives all events in terms of movement and location (Gruber, 1965; Jackendoff, 1972, 1976, 1983, 1996). Under this approach, movements can be extended to changes, whereas locations are extended to states. This approach explains the tendency of the *bǎ*-construction to co-occur with resultatives, directional complements and complements of manner or degree: the semantics of resultative complements includes both change and resultant state; directional complements denote change progressing in time, whereas manner or degree adverbs have a more static meaning and thus can be reinterpreted in terms of location.

2.3.3 The contribution of the *bǎ*-construction

We have seen in the preceding section that the notions that are commonly used to characterize the *bǎ*-construction – affectedness, disposal, causation and high transitivity – are often contributed by other sentence components. In the following, I consider the semantic-pragmatic contributions that the *bǎ*-construction can make on the levels of argument structure, information packaging and subjectification.

Argument structure

The most obvious contribution can be seen in those *bǎ*-constructions where *bǎ* contributes to argument structure (s. Section 1.1). Unfortunately, not many studies have considered and compared the semantics of the different argument distributions. The most "popular" form in this set are retained object sentences; syntactic accounts of retained object sentences have been proposed by Thompson (1973), Li (1990), Huang (1992) and Kuo (2009). On the other hand, causative *bǎ*-

constructions with extra causer arguments in subject position have been received separate treatments in Sybesma (1999) and Li (2003).

Information structure

According to Charles N. Li (1975), Chinese is a topic-prominent language; thus, sentence structure should be characterized in terms of topic and comment rather than subject and predicate. Besides, there is no satisfying definition for grammatical functions such as subject and object (Mei, 1961; Lapolla, 1993). Consequently, information-structural explanations have been generally popular in Chinese linguistics. Tsao (1986), Hsueh (1989), Bender (2000) and Li (2003) claim that one of the semantic-pragmatic functions of the *bǎ*-construction is the promotion of the *bǎ*-NP to a more topical status.

According to Tsao (1986), topic NPs in Chinese are characterized by the following properties:

1. Sentence-initial position

2. Separability from the rest of the sentence by pause particles (*(y)a, na, me, ba*)

3. Definiteness or genericity

4. The domain of a topic can extend over more than one sentence.

5. The topic NP controls the pronomilization or deletion of all coreferential NPs.

6. The topic NP plays no role in syntactic processes such as reflexivization, passivization and equi-NP deletion.

Out of these, only 1. and 2. are not properties of the *bǎ*-NP. Besides, Tsao also finds a parallel between *bǎ*-NPs and sentence-initial topics: thus, sentence-initial topics may specify the location of an event, or an entity that stands in a possessor-possessed, part-whole or substance relation. These possibilities are also available for the *bǎ*-NP; the following illustrates:

(111) Location:

a. 壁炉　他生　了　火。
Bìlú　tā shēng le　huǒ.
fireplace he make PFV fire
'He made fire at the fireplace.'

b. 他把 壁炉　生　了　火。
Tā bǎ bìlú　shēng le　huǒ.
he BA fireplace make PFV fire
'He made fire at the fireplace.'

(112) Substance:

a. 这 件 事　他写　了 一 份 报告。
Zhè jiàn shì　tā xiě　le　yī fèn bàogào.
this CLF affair he write PFV one CLF report
'He wrote a report about this affair.'

b. 他把 这 件 事　写　了 一 份 报告。
Tā bǎ zhè jiàn shì　xiě　le　yī fèn bàogào.
he BA this CLF affair write PFV one CLF report
'He wrote a report about this affair.'

(113) Part-whole:

a. 五 个 苹果 他吃了 三 个。
Wǔ ge píngguǒ tā chī le sān ge.
five CLF apple he eat PFV CLF three
'He ate three apples out of five.'

b. 他把 五 个 苹果 吃了 三 个。
Tā bǎ wǔ ge píngguǒ chī le sān ge.
he BA five CLF apple eat PFV CLF three
'He ate three apples out of five.'

However, based on empirical evidence, Liu (2007) suggests that higher topicality is not a universal property of the *bǎ*-NP.Liu conducts a statistical study of *bǎ*-constructions, SVOs and OSV-topicalizations (s. Section 1.2) along with their discourse contexts. She chooses groups of examples where no truth-conditional meaning differences arise between the forms. She finds that information status, prosodic weight and topicality jointly determine the choice of a structure. The two most frequent constellations for the *bǎ*-NP are old information and low topicality, as well as new information and prosodic heaviness. Besides undermining the general principles of word order – namely, old info preceding new info, and light constituents preceding heavy constituents – Liu's results show that the *bǎ*-NP cannot be systematically characterized as a topic.

Subjectivity and subjectification

Subjectification denotes the tendency for meanings to evolve from objective description of external situations towards the expression of speakers' individual perspectives and attitudes. Diachronically, subjectification is a process in course of which "forms and constructions that at first express primarily concrete, lexical and objective meanings come through repeated use in local syntactic contexts to

serve increasingly abstract, pragmatic, interpersonal and speaker-based functions" (Traugott, 1995). A formal diagnostics for subjectification are the changes in distributional patterns of a construction; specifically, a structure that undergoes this process expands its functional range and weakens the truth-conditional constraints when the relevant pragmatic conditions are met. According to Sun (2008), the role of subjectification in language change is more relevant for Chinese then for Indo-European languages.

Recently, a number of analyses (Shěn, 2002; Sun, 2008; Zhāng, 2009) have proposed that the *bǎ*-construction contributes to subjectification: it allows to reflect aspects of the speaker's evaluation and judgement of the situation. Shěn (2002) picks up the concept of disposal, being aware that its conception as a truth-conditional entailment does not account for the whole range of *bǎ*-constructions (s. Section 2.3.2). He proposes a less restrictive analysis by adding the concept of subjectivity[5] and claiming that the *bǎ*-construction is used to express "subjective disposal". Thus, by using the *bǎ*-construction, the speaker expresses his belief that the event is to be categorized as a disposal event, even if no disposal actually occurs; we get two "levels" of disposal which seem to be grammaticalized:

- Objective disposal: A intentionally exerts perceptible influence on B.
- Subjective disposal: speaker *believes* that A intentionally exerts influence on B.

After making this distinction, sentences can be classified into four types with

[5]Lyons (1982) provides the following definition of subjectivity:

> "The term subjectivity refers to the way in which natural languages, in their structure and their normal manner of operation, provide for the locutionary agent's expression of himself and his own attitudes and beliefs". (Lyons, 1982, p. 182)

respect to disposal:

1. Realis disposal reported by speaker:

(114) 我 吃 了 那 个 苹果。
Wǒ chī le nà ge píngguǒ.
me eat PFV this CLF apple
'I ate that apple.'

2. Realis disposal, construed as such by speaker:

(115) 我 把 那 个 苹果 吃 了。
Wǒ bǎ nà ge píngguǒ chī le.
me BA this CLF apple eat PFV
'I ate that apple.'

3. No objective disposal, but construed as disposal by speaker:

(116) 他 把 大门 的 钥匙 丢 了。
Tā bǎ dàmén de yàoshi diū le.
he BA door POSS key loose PFV
'He lost the key for the door.'

4. Neither objective nor subjective disposal:

(117) 他 丢 了 大门 的 钥匙。
Tā diū le dàmén de yàoshi.
he loose PFV door POSS key
'He lost the key for the door.'

As we see, 2. and 3. can be expressed by the *bǎ*-construction. Shěn provides pragmatic evidence for the distinction; he considers the use of the adverb *jūrán* ('suddenly') in continued discourse after the *bǎ*-construction:

(118) a. 阿明 看 了 老王 一眼，老王 居然 去 打 他。
Āmíng kàn le Lǎowáng yīyǎn, Lǎowáng *jūrán* qù dǎ tā.
Aming look PFV Laowang glimpse Laowang suddenly go hit him

‘Aming caught a glimpse of Laowang, and Laowang hit him *all of a sudden*.’

b. 阿明 把 老王 看 了 一眼，老王 (?居然) 去 打
Āmíng ba Lǎowáng kàn le yīyǎn, Lǎowáng (?*jūrán*) qù dǎ
Aming BA Laowang look PFV glimpse Laowang suddenly go hit
他。
tā.
him

‘Aming caught a glimpse of Laowang, and Laowang hit him (?*all of a sudden*).’

In (118a), the adverb is naturally used: in fact, it is quite unexpected that the act of Aming looking at Laowang results in Laowang hitting back. By contrast, *jūrán* seems odd in (118b): the *bǎ*-construction signals disposal, so a result of the disposal action – in this case the hitting reaction of the individual denoted by the *bǎ*-NP – is pragmatically plausible.

Shěn’s analysis, though based on pragmatic evidence, allows to naturally accommodate sentences that do not lexically express disposal under the category “subjective disposal”.

Further, by using the *bǎ*-construction, the speaker signals that he judges the agent to be responsible of the event. Zhāng (2009) considers the overall *bǎ*-construction as an expression of – possibly metaphorical – movement. The *bǎ*-NP does not act by its own force; thus, the action requires an external driving force, which comes from the subject. The subject is often a causer that does not act volitionally; this can be best demonstrated with inanimate subjects:

(119) 这 事 把 他 哭－累 了。
Zhè shì bǎ tā kū-lèi le.
this affair BA he cry-tired.RES PFV
'This affair made him cry to the extent of becoming tired.'

Furthermore, the subject may be both non-volitional and non-causing:

(120) 他 把 这 事 忘 了。
Tā bǎ zhè shì wàng le.
he BA this affair forget PFV
'He forgot about this affair.'

Such sentences can be constructed with other verbs expressing physical or mental loss, such as 丢 *diū* ('to loose'), 错过 *cuòguò* ('to miss') etc. In contrast to the normal SVO form, these sentences signal that the speaker wants to attribute the responsibility over the event to the entity denoted by the subject. Furthermore, although the subject participant acts unintentionally, it still has to deal with the consequences of the event.

Zhāng relates the *bǎ*-construction to another form which is used to emphasize the responsibility of the agent, namely *shi . . . (de)*-clefts. Independently of the properties of the subject, *bǎ*-constructions are always compatible with *shi . . . (de)*-clefts; the following examples illustrate:

(121) a. 是 第 一 口 烟 把 我 抢 得 连连 咳嗽 的。
Shì dì yī kǒu yǎn bǎ wǒ qiāng de liánlián késou de.
be ORD one CLF smoke BA me disturb DEG repeatedly cough EMPH
'It is the first portion of smoke that made me cough repeatedly.'

b. 是 他 把 这 辆 车 卖-出-去 了。
Shì tā bǎ zhè liàng chē mài-chū-qù le.
be he BA this CLF car sell-OUT-FROM.HERE PFV
'It is him who sold the car away.'

2.4 Summary

To summarize, the literature on the *bǎ*-construction has focussed on the part of speech of *bǎ* and the semantic constraints on the construction. Virtually all candidate syntactic categories – verb, light verb, preposition, case marker – have been explored in the search of a part of speech that would behave in the same way as *bǎ* in surface form. However, some of these categories are by themselves not clearly delimited in Chinese, as we have seen for the case of verbs and light verbs. The preposition category, although having a rather clean definition, exposes a behavior that is different from *bǎ*. The case marker analysis is based on theory-internal assumptions and cannot be applied to those cases where the argument structure of the sentence is enriched by the use of *bǎ*.

On the semantic side, we have seen that the often discussed notions of affectedness, disposal, causation and high transitivity can be used to characterize the "typical" *bǎ*-construction; however, they are by no means exhaustive. Besides, the literature often obscurs their status as constraints on the instantiation of the construction. Once a clear distinction is made between the constraints and the inherent semantic contribution of the construction, its "meaning" is commonly defined in terms of pragmatic notions such as information packaging and subjectification.

Chapter 3

Argument structure and realization

3.1 Introduction

This chapter presents the main notions, approaches and challenges in the domain of argument structure as a part of the syntax-semantics interface. Semantically, argument structure is concerned with the number and type of arguments that are associated with the meaning of a predicate; syntactically, it deals with the realization of these arguments in surface form.

A lot of work on argument structure turns around the assumption that a small number of principles dictate the mapping between semantics and syntax. Perlmutter (1983, p. 40) formulates the following hypothesis:

- Universal Alignment Hypothesis (UAH) in Relational grammar (Perlmutter, 1983): There exist principles of universal grammar which predict the initial relation borne by each nominal in a given clause from the meaning of the clause.

This idea has been reformulated for other frameworks; for example, Baker (1988) formulates the Universal Theta Assignment Hypothesis in GB, which states

that identical thematic relationships between items are represented by identical thematic relationships between those items on the level of deep structure (Baker, 1988, p. 46). In the following exposition, I use the pretheoretical term "Semantic Basis Hypothesis" (henceforth SBH) as introduced by Koenig and Davis (2006)) to refer to the central assumption behind these hypotheses – namely, that the syntactic context of a verb can be predicted from its meaning. Strong and underspecified as it is, this assumption has invited researchers to formulate different versions of mapping principles. They have encountered two main issues: on the one hand, we need to know which semantic properties of a lexical head are relevant for the realization of its arguments and thus must be specified in the lexicon. On the other hand, we must formulate the principles that use the lexical meaning representation of a head to determine its argument realization.

The SBH is challenged by a number of lexical (e. g. psych verbs) and structural (e. g. argument alternations) phenomena which show that language iconically parallels our ability to construe the world in different ways: the same real world event gives rise to multiple conceptualizations, which can be expressed by different linguistic means. Thus, a given approach has to choose between positing multiple lexical entries for each realization on the one hand, and underspecifying the information in the lexicon and "filling in" the missing parts online from contextual information on the other hand. This choice pertains to overall methodological and theoretical issues such as parsimony of the lexicon, division of labor between semantics and pragmatics and the nature of lexical vs. constructional meaning.

This chapter is organized as follows: after a brief description of the different stages of argument selection (Section 2), I present the traditional approach in terms of semantic roles (Section 3); this approach considers event participant types as the primitive "units" that constitute the syntax-semantics interface in the domain of argument structure; in Section 4, I show how the semantic role ap-

proach has been challenged both on theoretical and empirical grounds. In Section 5, I describe the more recent decompositional approach to argument realization; it abandons the view under which participant roles are treated as semantic primitives. The decomposition of predicate meanings or semantic roles, while coming at the cost of a more complex ontology, allows for a more precise isolation of syntactically relevant meaning components.

3.2 The five stages of argument selection

Following Du Bois (2003), the process of argument selection can be decomposed into five stages, namely argument inclusion, ranking, linking, targeting and realization.

Argument inclusion

Argument inclusion determines the number and type of the arguments that are included in the lexical semantic representation of a predicate. Arguments can be included at multiple levels. First, a predicate has a certain number of argument positions, which must be filled by arguments of specific types. For example, *eat* has two argument positions which are to be filled with nominal arguments of the entity type (*e*); one of the arguments − the thing that is eaten − might be left unspecified. *Believe* also has two argument positions; however, the second position is of type proposition (*t*).

Second, there are arguments which are already inherently contained in the meaning of the verb. This is the case for denominal verbs such as *to butter, to jail* etc. These verbs are morphologically derived from nouns and imply the entity denoted by the noun as a participant. Conceptually, these verbs can be decomposed into a combination of a light verb and an object (e. g. *to butter* = *to put butter*, *to jail* = *to put into jail* etc.).

Finally, there are rather universal elements of event structure that are more independent of specific predicate meanings and are normally realized as adjuncts. Thus, an event normally has a time and a location, which, however, need not be overtly expressed. These elements are normally not relevant for argument realization.

Argument ranking

We have seen that argument inclusion determines the set of arguments that are included in the lexical semantic representation of a predicate. Argument ranking provides this set with an internal ordering that can be exploited for the formulation of generalizations about surface realization. A common approach is the ordering of arguments by prominence; this allows to make a link to surface realization via the principle of prominence preservation, which states that syntactic prominence follows semantic prominence (Jackendoff, 1990; Levin and Rappaport Hovav, 2005). Thus, semantic role hierarchies have been proposed by Fillmore (1968, 1971b), Jackendoff (1972), Belletti and Rizzi (1986), Baker (1989) and Grimshaw (1990).

Another criterion for determining relative prominence is the amount of content associated with an argument: thus, in entailment-based approaches (Dowty, 1991; Ackermann and Moore, 2001; Beavers, 2005, cf. Section 3.1), arguments are ordered by decreasing number of associated entailments.

Argument linking and targeting

Argument linking and targeting are the pivot stages between semantics and syntax in the argument selection process: they determine how the mapping between semantic roles and surface arguments is established. The set of typical participants

is larger than the set of available grammatical functions (or surface NP positions); thus, a one-to-one correspondence is impossible. One possible approach to mapping is the alignment between two prominence hierarchies, namely a hierarchy of semantic roles and a hierarchy of grammatical relations. However, both hierarchies are derived constructs, which may induce circularity. Another option is the reduction of the number of semantic roles; this has been used in generalized semantic role approaches as proposed in Role and Reference Grammar (van Valin, 1993) as well as in Dowty's protorole approach (Dowty, 1991).

Argument realization

Argument inclusion, ranking, linking and targeting basically determine the syntax and semantics of argument selection. Argument realization in a narrow sense is mainly concerned with pragmatic aspects of argument structure, such as argument salience, attention management, processing facilitation and speaker management of hearer expectations. The study of argument realization requires a different methodology than the previous stages. Du Bois (2003) conducts a statistical study of argument realization tendencies in discourse; he formulates a set of constraints on preferred argument realization options which refer to the lexicality and the givenness status of core arguments. Due to their pragmatic nature, these constraints are not absolute, but capture strong tendencies which might also play into language change and grammaticalization.

3.3 The traditional approach: semantic role lists

The idea of semantic role lists is that grammatically relevant facets of verb meaning can be represented by a list of roles of the participants in the described event. The members of the set of roles are atomic concepts that represent prototypical

relations between participants and events in which they play a role. Generalizations over verb classes can be formulated based on identical sequences in their semantic role lists.

The Case grammar approach developed by Fillmore (1968, 1971b, 1977) is at the origin of the semantic role approach. Fillmore treats semantic roles as "semantic cases". Semantic case is a linguistic universal: every language has an underlying level of semantic case assignment. He proposes the following set of cases:

- AGENT: instigator of the event
- OBJECT (PATIENT): changing/moving entity, or entity whose position/existence is under consideration
- RESULT: entity that comes into existence as the result of an action
- INSTRUMENT: stimulus or immediate physical cause of the event
- SOURCE: place from which something moves
- GOAL: place to which something moves
- EXPERIENCER: entity that receives/accepts/experiences/undergoes the effect of an action
- PLACE: location at which an event takes place.

As an example, the verb *break* gets the case frame (= semantic role list) [AGENT, INSTRUMENT, PATIENT], whereas *hit* gets the frame [AGENT, INSTRUMENT, PLACE]. Thus, the verbs differ in the role of their third argument; this difference is reflected in surface use:

(122) a. I broke/hit the window.

b. The chisel broke/hit the window.

c. The window broke/*hit.

The explanation for the acceptability contrast in (122c) is that patients, but not places can become subjects in the causative alternation.

Mapping is subject to the following uniqueness constraint:

- **Uniqueness constraint** on case assignment:

  1. Each case relation may occur only once in a clause.[1]

  2. Each case can only be assigned once in the sentence.

Finally, a set of rules determines the mapping between semantic cases and grammatical functions; as an example, consider the rule for subject selection:

(123) **Subject Selection Rule**:

1. If there is an Agent, it becomes the subject.

2. Otherwise, if there is an instrument, it becomes the subject.

3. Otherwise, the subject is the Patient.

The following illustrates:

[1] "Compounded" instances of a case are possible in NP coordinations where the two conjuncts are subsumed under one case:

(i) Pat and John broke the window.

NP coordination is only possible for NPs with the same case:

(ii) * Pat and the stick broke the window.

(124) a. subject = agent:

John broke the window.

b. subject = instrument:

The chisel broke the window.

c. subject = patient:

The window broke.

Thus, the realization of the patient as subject is impossible if an agent or an instrument is also present in the sentence:

(125) * The window broke with the chisel / by John.

The Uniqueness Constraint as well as the Subject Selection Rule imply that relations between co-arguments are also relevant for syntactic realization. In order to reduce the number of mapping rules, authors have looked for natural orderings on semantic roles which would allow to capture regularities in the realization of the corresponding arguments. I have mentioned semantic role hierarchies as a common approach to argument ranking. Numerous versions of thematic hierarchies have been formulated that account for specific phenomena (cf. Levin and Rappaport Hovav 2005, p. 156-164, for an overview); however, as these hierarchies mostly target restricted fragments of specific languages, they cannot yet be considered as a universal basis for generalizations.

3.4 Challenges for the semantic role approach

Semantic roles are derived meta-level constructs; they come with the usual issues of definition and delimitation against each other, as well as the problem of finding the right grain size. Our starting assumption – the SBH (Section 1) – can be reformulated as follows under the semantic role approach: “the argument

realization of a verb can be predicated from the list of its semantic roles". This statement does not hold empirically: lexical meanings and syntactic structures are often ambivalent, reflecting our cognitive ability to conceive the world in different ways; thus, a lexical-semantic representation of a predicate that only specifies the associated semantic roles is often not sufficient to predict its options of argument realization.

3.4.1 Theoretical challenges for semantic role lists

Mapping theories that are based on semantic roles make a very strong prediction: each semantic role must be associated with some content, abstract enough to be used for characterizations of participants across verb classes. On the other end, each verb must be specified in such a way that it entails of its arguments information that is sufficient for the unequivocal assignment of semantic roles to these arguments.

One problem is the choice of the right grain size for distinctions of semantic roles. When using semantic roles for generalizations about argument expression, phenomena differ in their coverage and require different grain-sizes of role definition. For example, English has the very general and cross-linguistically common property that causative verbs express their AGENT as subject and their PATIENT as object. However, other argument distributions require more specific distinctions; consider the following sentences:

(126) a. The key opened the door.

b. * The fork ate the banana.

Both subjects are INSTRUMENTs: they can be realized in a *with*-PP or with the verb *use*. However, a further bifurcation is required in order to explain the acceptability contrast between the two sentences. Dowty (1991) proposes "role fragmentation", which means that semantic roles can be further subdivided into

more specific roles as long as these deeper differentiations are grammatically relevant. Thus, for (126), the relevant distinction would be between "intermediary" and enabling/facilitating instruments, whereby only the former can be realized as the subject of a clause (Marantz, 1984). The problem with role fragmentation is that it happens on a scale on which both extremes are undesirable: too broad definitions fail to predict specific differences in the argument realization behavior of verbs, whereas highly specific distinctions (up to extra "individual" semantic roles for special verbs, e. g. *require*, *apprehend*, cf. Dowty (1989)) lead to a big number of roles and reduce the explanatory power of more general semantic roles.

On the other hand, common semantic roles, by their enumerative character, are not an elegant tool to express generalizations that span over several roles. The reason is that there are less morphosyntactic alternatives for argument marking than semantic roles. As formalized by Fillmore's Subject Selection Rule in (123), the subject position in English can be instantiated by agents, instruments and patients. Another example are *with*-PPs, which can be instantiated both by instruments and comitatives:

(127) a. Mary read the book *with a dictionary*.

b. Mary read the book *with John*.

In the traditional approach, there is no level of representation at which instruments and comitatives appear together and can be uniformly characterized as appearing in *with*-PPs.

Problems of correspondence The restrictive power of semantic role approaches comes from the assumption of a one-to-one correspondence between semantic roles and NP positions in a clause: the same role may be assigned only once in a clause, and one surface argument may be assigned only one semantic role. A

number of counterexamples undermine the universality of this claim; thus, some verbs seem to assign the same role to multiple arguments:

(128) a. Pat resembles Sue.

b. Sue resembles Pat.

The switch of the positions of the arguments does not affect the truth-conditional meaning of the sentence; however, the sentences differ in pragmatic interpretation: the object is interpreted as a standard of comparison (landmark), whereas the subject, being the main entity under observation, is more topical (figure). Thus, the different realization stems from a difference in the subjective evaluation of the speaker, and not in the real-world properties of the eventuality.

3.4.2 Empirical challenges

The Semantic Basis Hypothesis presupposes a one-to-one mapping between real-world events and syntactic structures. In its strict form, it misses the insight that we may conceive events in different ways and that languages provide us with the means to express these different conceptualizations. Thus, event construal is a subjective matter: the individuation of an event is not linguistic, but perceptual. When conceptualizing a perceived event, we choose from a set of possible conceptual structures, which have different linguistic counterparts. The choice is conditioned by subjective factors, personal evaluation, epistemic modality etc.

The non-uniqueness of event construal shows up both in lexicon and in structure. In the lexicon, we find near-synonymous pairs with different argument distributions and variations in the argument realization of specific verb classes both within and across languages. In the structural domain, argument alternations allow for different event construals using the same verb.

Argument selection indeterminacy and nonstandard lexicalizations

Some verbs can be grouped in pairs whose elements have a near-synonymous meaning; thus, both verbs describe the same type of event and take the same set of arguments. However, the realization of the arguments differs; this contradicts the assumption that the meaning of a verb determines its syntactic context.

First, we have verbs of commercial transaction, e. g. *sell, buy* etc. These verbs normally entail two agents and two transferred entities. The realization of the two agents varies:

(129) a. John sold me the book.

b. I bought the book from John.

Psychological verb pairs, such as *please/like, frighten/fear, strike as/regard as* are another example for synonymous verb pairs with different argument realizations. Semantically, psychological verbs take an experiencer and a stimulus argument. These arguments alter between the subject and the object position:

(130) a. John pleases/frightens Sue.

b. Sue likes/fears John.

The choice seems to be conditioned by the aspectual interpretation of the event: verbs realizing the experiencer as the subject are stative, whereas verbs realizing the stimulus as subject can be interpreted as inchoative (Croft, 1986). Besides, the realization of the stimulus in subject position allows for an intentional interpretation of the stimulus.

Finally, symmetric predicates show that one semantic role may be assigned more than once in a clause:

(131) a. John married Mary.

b. Mary married John.

c. Mary and John married.

All three sentences can be used to describe the same event; an entailment relation holds between each pair of examples. Thus, in the real-world eventuality, both arguments of the verb have identical roles; the choice of a variant is conditioned by the speaker's intention of fore-/backgrounding of the participants.

Similar semantics and different syntax: argument alternations

An argument alternation is a pair of argument realization options for one verb. Common examples for argument alternations in Indo-European languages are dative shifts, conative and locative alternations. To illustrate, the following example pair shows the English conative alternation:

(132) a. He ate the apple.

b. He ate <u>at</u> the apple.

In most cases, we find a truth-conditional difference between the two variants of an alternation: one variant in an alternation normally subsumes the other because it is more specific. In (132), (a) has a "larger" set of truth conditions than (b) in that it specifies the consumed quantity. Thus, (a) semantically subsumes (b): if John ate the apple, he unavoidably also ate *at* the apple. The difference is paralleled by a switch in telicity. However, *the apple* being considered a patient in both cases, semantic roles do not allow us to capture the meaning contrast.

The difference in amount of semantic information can be further described qualitatively. On the one hand, alternations by themselves already determine part of the meaning difference. For example, the conative alternation entails different degrees of affectedness; however, the exact nature of the contrast is dependent on the verb class. Compare the conative alternation with *eat* to verbs of physical impingement:

(133) a. He hit the window (and it broke).

b. He hit at the window (# and it broke).

(133a) implies that the patient is potentially affected by the action, whereas (133b) excludes the possibility of affectedness. Thus, while *eat* and *hit* both manifest a difference pertaining to affectedness, they differ with respect to the degrees of affectedness expressed by the two variants of the alternation.

Argument alternations challenge the view that the argument realization of a verb is fixed lexically. In order to capture the different realizations and the meaning differences between the variants, we would have to postulate two different entries for the alternating verbs; such an approach conflicts with the goal of maximal parsimony in the lexicon.

Argument alternations are restricted to specific classes of verbs (cf. Levin 1993 for a comprehensive classification of English verbs with respect to their participation in different alternations); the classes to which an alternation applies largely differ in size. Thus, the conative alternation is possible for most verbs expressing affectedness, whereas the "fulfilling" alternation (Levin, 1993, p. 65 – 66) is only possible with verbs describing a special kind of transfer between two participant:

(134) a. The judge presented / gave a prize to the winner.

b. The judge presented / * gave the winner with a prize.

The ability of a verb to undergo specific alternations relates to the semantic contrast between the two variants. Thus, the verb meaning must contain the semantic component that allows the basic meaning to be "extended" in the way that is specified by the alternation. The conative alternation, triggering a difference in affectedness, excludes non-affectedness verbs:

(135) a. John sees the window.

b. * John sees at the window.

Furthermore, the meaning component that makes the difference in specificity is the additional information about degree of affectedness. This means that we require actions which leave the degree of affectedness underspecified; a verb like *break* is not possible in the conative alternation because it lexically fixes the degree of affectedness:

(136) a. Mary broke the window.

b. * Mary broke at the window.

This contrast in distribution cannot be captured under the semantic role approach: there is no standard way for semantic roles to differentiate between the object arguments of *eat* and *break* in order to capture the different degrees of result specificity.

3.5 Decomposition

Semantic role lists are problematic because it is virtually impossible to define a universal set of modes of participation in events which would allow to model the variety of possible linking phenomena. Besides, the constructs that we posit at the syntax-semantics interface should ideally have an intrinsic semantic motivation, both in terms of grain-size and of ontological appropriateness. One natural approach would be to give up the view of semantic roles as primitive units and further decompose the roles or predicate meanings into natural semantic components of event structure; linguistic meanings can then be characterized via combinations of these atomic components.

In the following, I first present feature decomposition of semantic roles, which characterizes roles via sets of necessary and sufficient conditions that are encoded in terms of binary features. By contrast, entailment-based approaches proceed in a prototype-theoretical fashion: they decompose semantic roles into typical, but not

required entailments. Finally, I describe the predicate decomposition approach, which abstracts over lexical predicates by decomposing them into syntactically relevant primitive subevents.

3.5.1 Feature decomposition of semantic roles

The feature decomposition approach has been proposed by Anderson (1971), Ostler (1979), Reinhart (2000, 2001, 2002) and Rozwandowska (1989), *i. a.* Under this approach, semantic roles are defined by small sets of binary features, such as [change +/-], [sentience +/-], [control +/-] and [animate +/-]. The approach provides an elegant solution to the cross-classification problem that arises if we want to formulate generalizations that span over multiple semantic roles – these can be expressed via feature sharing between the roles.

Feature decomposition allows for different grain sizes: feature distinctions can be accommodated at different levels of specification in a hierarchy. For example, the [cause] feature can be further specified for [volition], [control] and [animacy]. The choice of a level for a generalization can be flexibly adapted to the requirements of specific languages and phenomena.

Reinhart (2000) considers only argument types that are relevant to causality – in traditional terms, these correspond to agents, causes, patients/themes and experiencers. She posits two binary features – cause and mental state – that characterize the traditional semantic roles. The distribution of the features is as follows:

(137)

	agent	cause/instr	patient/theme	experiencer
cause	+	+	–	–
mental state	+	–	–	+

Predicates may underspecify the selected roles; for example, *open* selects for a [c +] argument in subject position, which means that it can be instantiated by an

agent, a cause or an instrument:

(138) a. John opened the door.

b. The wind opened the door.

c. The key opened the door.

3.5.2 Semantic roles as entailment clusters

The main idea behind the entailment-based approach is that generalizations about argument realization can be expressed by a very restricted number of roles − normally two − that are associated with larger sets of characteristic entailments; these entailments reflect the properties that hold of an NP if it is realized as the argument of a given verb. Thus, the meaning of a verb entails certain general properties of its participants: for example, *eat* entails of its agent that it performs a volitional action; in turn, the patient undergoes a change of state by being consumed.

Decomposition of semantic roles has been adopted in Dowty (1991), van Valin (1993), Ackermann and Moore (2001) and Beavers (2006), *i. a.* In the following, I first present Dowty's original proto-role approach. I then describe Beavers' approach in terms of entailments on affectedness degrees which specifically targets argument alternations.

Dowty's proto-roles

Dowty (1991) operates with the two semantic proto-roles agent and patient. Each role is associated with a cluster of entailments that characterize the corresponding participant type. The following shows the composition of the clusters, along with examples of predicates where the property is the only cluster property held by the respective participant:

- AGENT:
  - Volition (*to ignore*)
  - Sentience/perception (*to know, to see*)
  - Causation (*to cause*)
  - Movement (*to fill*)
  - (Independent existence (*to need*))
- PATIENT:
  - Change of state (incl. coming into existence, going out of existence) (*to make/erase a mistake*)
  - Incrementality (*to fill the glass*)
  - Causal affectedness (*Smoking causes cancer.*)
  - Stationarity (*The bullet passed the target.*)
  - (no independent existence (*to build*))

These entailments allow for fine-grained characterizations of event participants. As Dowty only considers subjects and objects, he does not require a set of mapping rules; argument mapping is generalized by the following principle (Dowty, 1991, p. 576):

- **Argument Selection Principle**: In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of proto-agent properties will be realized as subject. The argument with the greatest number of proto-patient properties will be realized as direct object.

Thus, in a sentence like *Chris killed Pat*, *Chris* is realized as subject because it has all the proto-agent properties (except for volition), but does not have any

patient property; similarly, *Pat* has all the proto-patient entailments except for incrementality.

The Argument Selection Principle comes with the following two corollaries:

- **Corollary 1**: If two arguments of a relation have equal numbers of entailed proto-agent and proto-patient properties, then either or both may be lexicalized as subject; similarly for objects.

- **Corollary 2**: With a three-place predicate, the non-subject argument with the greater number of entailed proto-patient properties will be lexicalized as the direct object. The non-subject argument with fewer proto-patient properties will be lexicalized as oblique or prepositional object.

Proto-roles do not classify arguments exhaustively, uniquely or discretely. There are verbs whose subjects have no proto-agent properties (e. g. *resemble*), just as verbs whose objects do not have proto-patient properties (e. g. *recognize, like*). Some arguments mix up the sets of entailments; thus, the experiencers of psych-verbs have both the proto-agent entailment of sentience and the proto-patient entailment of change of state. This is reflected in the lexical argument realization patterns of psych verbs − as illustrated in Section 4.2, we find numerous near-synonymous pairs of psych verbs which differ in the realization of their experiencer and stimulus between subject and object position.

Finally, the entailments are not equally relevant for argument realization: the number of entailments does not fully characterize a participant. Instead, entailments have different "weights"; specifically, causation outranks the other proto-agent entailments, whereas change of state outranks other proto-patient entailments.

Analysis of argument alternations in terms of entailments Beavers (2006) focusses on argument alternations; thus, instead of considering the relative distri-

bution of a verb's arguments in a given use, he targets the different realization possibilities for the same argument of a verb. He restricts the domain of application of the approach to argument alternations that express differences in affectedness; thus, it does not account for the semantic-pragmatic differences in alternations which do not relate to affectedness, e. g.:

(139) a. The tank leaked water.

b. Water leaked from the tank.

(140) a. Tony admired them for their integrity.

b. Tony admired the integrity in them.

Just as in Dowty's approach, the semantics of an argument is described by a set of truth conditions. However, instead of formulating sets of entailments for co-occurring arguments, Beavers focusses on those entailments that hold of one and the same argument when it gets realized in different ways. In order to account for the quantitative meaning differences between alternation variants, Beavers uses an implicational hierarchy of sets of truth conditions. The relevant criterion is the specificity of a degree of affectedness:

(141) affected to degree d > affected > potentially affected > not affected

In this hierarchy, higher levels represent sets of truth conditions which subsumes the truth conditions of lower level. The parallel to syntactic realization is based on prominence preservation: arguments which are more oblique are less prominent syntactically. This decrease in structural prominence corresponds to a lower level on the semantic hierarchy. The mapping is regulated via the following principle:

(142) **Morphosyntactic Alignment Principle**: When participant x may be realized as either a direct or oblique argument of verb V, it bears semantic role R as a direct argument and semantic role Q as an oblique argument, such that $Q \subset R$.

Semantic roles correspond to sets of entailments; thus, the relative prominence of semantic roles is determined based on the number of entailments in its set. Consider the conative alteration once more:

(143) a. He ate the apple.

b. He ate at the apple.

In (a), the patient is completely eaten − thus, it is affected to a specific degree; by contrast, in (b), the patient is affected to an unspecified degree. The subsumption relation between the two sentences follows from the hierarchy in (141).

Further, the approach captures the root dependency of argument alternations: we have seen in Section 3.1 that different verbs may trigger different meaning contrasts when instantiating the same argument alternation. For example, *eating* in the conative alternation changes from a total to an unspecified degree of affectedness, whereas *hitting* passes from unspecified to potential affectedness. Again, these contrasts, while preserveing the subsumption relation between the variants, can be accommodated via the implicational hierarchy.

3.5.3 Predicate decomposition

Under the predicate decomposition approach, the grammatically relevant meaning components are found directly in verb meaning; events are decomposed into more primitive event components, e. g. GO, CAUSE, BE etc., which are argument-taking functions. These meaning components can be used in isolation or combined in order to produce templates that can accommodate the core meanings of whole

verb classes. The following shows a simple template for *run* and a more complex template for *open*:

(144) a. *run*: [x ACT$_{<run>}$]

b. *open*: [[x ACT] CAUSE [y BECOME <*open*>]]

The bracketed elements (< >) represent idiosyncratic elements of verb meaning which are not relevant for syntax. The rules can be formulated based on the geometry of the predicate template: for example, we can say that "the first argument of ACT is always realized as subject".

Under this approach, semantic role labels become superfluos; they are dissolved into argument positions of the primitives. Typically, there are more semantic role labels than argument positions of primitive predicates: a number of semantic roles are associated with adjuncts rather than arguments (e. g. GOAL, SOURCE) and thus are not components of verb meaning. Besides, primitive predicates provide a more coarse-grained differentiation of verb meaning than semantic roles; this is compensated by the possibility to accommodate multiple primitive predicates in the lexical representation of a verb, whereby the same argument can be "selected" by more than one of these predicates.

3.6 Summary

This chapter has reviewed the theories and challenges around the long-standing assumption that the argument realization of a verb can be predicted from its meaning. Researchers working with this assumption have looked for the syntactically relevant meaning components on the one hand, and for the principles which allow to predict argument realization on the other hand. The original approach in terms of theta-roles / semantic roles uses a set of recurring participant types which correspond to the semantic role labels. As semantic roles are viewed as unanalyzable

constructs, the definition of the types is not always clear; thus, using semantic roles comes with the risk of stipulating labels when this is actually required in order to explain mapping regularities, and thus undermine the intrinsic semantic motivation of argument structure.

Mapping principles formulated on the basis of semantic roles have been challenged by a number of phenomena; subsequently, authors have recognized the relevance of event structure for syntax. Thus, event structure has been analyzed in terms of more primitive meaning components; decompositional approaches have targeted recurring "core" elements of predicate meanings, and modes of involvement of participants.

Chapter 4

The semantic basis of argument realization

In the previous chapter, we have seen that the traditional approach to argument realization in terms of semantic roles does not sufficiently differentiate the semantic determinants of argument realization. This shortcoming has been addressed by the decompositional approach, which maps argument realization options directly onto the grammatically relevant properties of real-world events; thus, event predicates can be decomposed into basic primitive events, whereas semantic roles can be decomposed into basic forms of involvement of the participants. However, treating these subcomponents as "blackboxes" or "syntactic diacritics" (Koenig and Davis, 2006) does not allow to explain how it comes that they impact on argument realization in the ways they do. Such an approach always comes with the risk of postulating semantically unmotivated labels where they seem to be appropriate to account for regularities of argument realization. In order to avoid this, we require a more detailed consideration of the semantic categories involved in argument realization. In this chapter, I first present the categories of situation type, affectedness and transitivity and then show how have been formalized for

the analysis of argument realization phenomena.

4.1 Description of the relevant categories

4.1.1 Aspect and situation type

Vendler (1957) classifies situations into the following four types which determine their temporal organization:

- States: *love someone, know the answer*
- Activities: *run around, play in the garden*
- Accomplishments: *build a house, eat an apple*
- Achievements: *recognize someone, reach the top*

The three relevant features based on which the classes can be described are durativity, dynamicity and the inclusion of a natural endpoint in the event after which a new state obtains, also known as telicity. The following table shows the configurations of these features for the four situation types:

(145)

	Durativity	Dynamicity	Telicity
State	+	−	−
Activity	+	+	−
Accomplishment	+	+	+
Achievement	−	+	−

The telicity feature has received particular attention in the literature (Depraetere, 1995; Jackendoff, 1996; Krifka, 1998; Hay et al., 1999; Wechsler, 2001; Kennedy, 2012; Beavers, 2011b). Telicity is to be distinguished from perfectivity, which is

a notion of viewpoint: whereas telicity entails perfectivity, the inverse is not true – a sentence like *John studied Chinese* is perfective without being telic.

Formally, telic events are often characterized by not having the subinterval property: parts of telic events cannot be described by the same predicates that describe the overall events. Thus, a event that can be described by a predicate like *eat the apple up* excludes proper subevents that could also be described by this predicate. By contrast, an event described by *eat apples* contains subevents to which the same predicate can apply. There are three common tests for telicity: first, temporal adverbials are sensitive to the telicity value of the modified event. Thus, *in X-time*-adverbials combine with telic events, whereas *for X-time*-adverbials combine with atelic events:

(146) a. Kim ate the apple in / *for 3 min. (*telic*)

b. Kim sang for / *in 3 min. (*atelic*)

A second test is the progressive test: the progressive form of an atelic predicate entails its participle, whereas the progressive form of a telic predicate does not:

(147) a. John is studying Chinese. $\rightarrow$ John has studied Chinese.

b. John is eating an apple. $\not\rightarrow$ John has eaten an apple.

A final diagnostics for telicity is the adverb *almost*. Thus, *almost* in combination with a telic predicate is ambiguous between a reading where the event was about to start and one where the event was about to finish:

(148) John almost ate the apple.

1. *John was about to start eating the apple.*
2. *John almost finished eating the apple.*

By contrast, an atelic predicate only allows for the reading where the event did almost start:

(149) John almost played tennis.

1. *John was about to start playing tennis.*
2. *# John almost finished playing tennis.*

The equivocal behavior of some predicates with respect to the telicity feature has challenged Vendler's triple of the linguistically relevant temporal features of a predicate. Specifically, a new situation type − so-called degree achievements − has been detected that cannot be accommodated in Vendler's system (Dowty, 1979; Abusch, 1986). Degree achievements pick out an inherent property of their theme argument and denote a change in this property; typical examples are *cool, lengthen, straighten*. These verbs behave ambiguously with respect to the telicity tests; thus, they combine both with *in-* and *for X-time*-adverbials:

(150) The soup cooled in / for 5 min.

As for the progressive test, different degree achievements lead to different results:

(151) a. Kim is lengthening the rope. $\rightarrow$ Kim has lengthened the rope.

b. Kim is straightening the rope. $\not\rightarrow$ Kim has straightened the rope.

(Hay et al., 1999)

Looking beyond degree achievements, it has been recognized that other classes of verbs may also be attributed to different situation types based on their context of occurrence. Thus, the telicity value of incremental theme verbs is dependent on the boundedness value of the theme argument:

(152) a. John ate *apples* for / *in 10 min.

b. John ate *the apple* in / *for 10 min.

Similarly, the telicity value of motion verbs changes with the boundedness of the theme or the path:

(153) a. *Balls* rolled down to the bottom of the hill for / *in an hour.

b. *The ball* rolled down to the bottom of the hill in / *for an hour.

(154) a. The ball rolled down *to the bottom of the hill* in / *for an hour.

b. The ball rolled down *the hill* for / in an hour.

These data show that the situation type of an event cannot be derived solely on the basis of the lexical verb; instead, we also have to consider the semantics of its arguments. In variable telicity phenomena, different degrees of change are entailed of the participants: contrary to atelic sentences, telic sentences come with a specified "amount" of change. In the following, I consider the linguistic expression of change of state in participants.

4.1.2 Affectedness

Affectedness refers to the "persistent change in an event participant". It comprises different aspects of involvement of the direct object in the event expressed by the verb. Following Beavers (2010), the following event types express affectedness:

1. Change of state: *x* changes in some observable property (*paint, clean x*)
2. Transformation: *x* transforms to something else (*carve, turn x into y*).
3. Directed motion: *x* moves to some location (*roll, pull x*).
4. Surface contact/impact: *x* is physically impinged (*kick, sweep x*).
5. Creation: *x* comes into existence (*build, create x*).
6. Consumption: *x* goes out of existence (*destroy, eat x*).

Affectedness is a typical property of objects (Fillmore, 1968; Dowty, 1991). It influences the morphosyntactic marking of objects of transitive verbs and may license grammatical processes such as voice alternations and reflexivization (Hopper and Thompson, 1980; Tsunoda, 1985; Jaeggli, 1986; Malchukov, 2005). Typical examples for affectedness-sensitive phenomena are structures in which the affected NP is placed before the predicate; the following illustrates:

(155) Middle constructions:

a. The door opens easily.

b. * Traffic jams avoid easily.

(156) DP passives:

a. the city's destruction by the Mongols

b. * the criminal's pursuit by the cops

(cf. Tenny 1992, p. 8–9)

In the literature, affectedness is often used as an intuitive concept; some authors use a minimal formalization in terms of a boolean feature (cf. Anderson 2006). However, some phenomena are sensitive to degrees of affectedness. Tsunoda (1985) conducts a cross-linguistic study of transitive case patterns and passivization. He establishes the following ordering of predicate classes with decreasing affectedness:

1. Direct effect on patient:

   - Resultative, e. g. *kill, break*
   - Non-resultative, e. g. *hit, shoot*

2. Perception:

   - with attained patient, e. g. *see, hear*

- with non-attained patient, e. g. *look, listen*

3. Pursuit, e. g. *search, wait*

4. Cognition, e. g. *think, understand*

5. Emotion, e. g. *want, need*

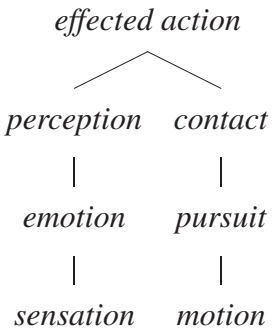
6. Relationship, e. g. *possess, resemble*

7. Ability, e. g. *capable, proficient*

Verbs with a stronger affectedness meaning are more likely to appear in transitive case frames and to undergo passivization, while the weaker affectedness verbs are more likely to take an intransitive or oblique case pattern and to resist passivization.

Malchukov (2005) proposes a further differentiation: he bifurcates Tsunoda's hierarchy in order to distinguish between verbs with agent-oriented and verbs with patient-oriented affectedness properties:

(157)



This distinction captures why some case and voice alternations target the subject and others the object.

Beavers (2010) proposes the following of affectedness tests:

- Affectedness clauses can be used as objects in '*what happened to X is Y*'-sentences (cf. Cruse 1973, Jackendoff 1990):

(158) a. They destroyed the city.

b. What happened to the city was they destroyed it.

(159) a. They followed the star (out of Bethlehem).

b. * What happened to the star was they followed it (out of Bethlehem).

- Entailment of change: the completion of an affectedness event entails that something has changed about the affected participant:

(160) a. He just cleaned the room, ? but it didn't change. (*affectedness*)

b. He just visited the room, but it didn't change. (*no affectedness*)

- Resultatives: the traditional view is that subjects of resultative phrases must be objects of the main verbs in underlying structure. Beavers proposes a semantic counterpart to this explanation: resultatives are semantically constrained in that their subject must be a force recipient. In the case of transitive motion verbs, the resultative XP is predicated of the subject which changes location:

(161) The man followed the star to Bethlehem.
(*the man follows the star* $\rightarrow$ *the man ends up in Betlehem*)

Thus, the possibility to adjoin a resultative XP to a predicate is a diagnostics for the presence of the affectedness component.

- Types of result XPs: predicates differ in their degree of productivity with the resultative construction. Predicates that are specific about the change of the patient allow for a limited range of resultative complements; for example, *shattering x* inevitably results into the decomposition of *x* into a big number of pieces:

(162) a. John shattered the vase *into a million/thirty-six different pieces*.

b. # John shattered the vase *slightly/in half/into two pieces/silly/ flat/red/up*.

By contrast, predicates that underspecify their result are acceptable with a larger number of resultative phrases:

(163) John wiped his face *dry/clean/off/raw/to a healthy glow*.

The specificity of the entailed result relates to telicity: more specific results are expressed by telic predicates (e. g. *shatter x*), whereas general results can be expressed by atelic predicates (e. g. *wipe x*).

Different verbs show different coverage with respect to these tests; the degree of affectedness expressed by a predicate is determined from the number of tests which apply to it.

4.1.3 Transitivity

Just as affectedness, semantic transitiviy is a gradient and composite category. Traditionally, transitivity is described as the "transfer of an action from agent to patient". In their well-known paper, Hopper and Thompson (1980) (henceforth HT) propose a decomposition of semantic transitivity into ten semantic parameters that are reminiscent of Wittgenstein's family resemblances (Table 4.1). The linguistic relevance of these parameters is proved via morphosyntactic alternations that are triggerred by contrasting parameter values. Different parameter values yield different structures for case marking, agreement, actancy split and voice alternations.

Thus, we have a variety of structural differentiations on the one hand, and a set of rather disparate semantic parameters on the other hand. A question that nat-

Table 4.1: Transitivity components and their linguistic encoding

Property	High transitivity	Low transitivity
Participants	≥ 2: Agent and Patient	1
Kinesis	Action	Non-action
Aspect	Telic	Atelic
Punctuality	Punctual	Durative
Volitionality	Volitional	Non-volitional
Affirmation	Affirmative	Negative
Mode	Realis	Irealis
Agency	Agentive	Non-agentive
Affectedness of O	Totally affected	Non-affected
Individuation of O	Totally individuated	Non-individuated

urally arises is how we can obtain a more precise characterization of the relation between the two sets. HT formulate the following hypothesis which uniformly applies to all parameters and already pertains to structural realization:

(164) **Transitivity hypothesis**: whenever an obligatory pairing of two transitivity features occurs in the morphosyntax or semantics of a clause, the paired features are always on the same side of the High-Low Transitivity Scale.

A problem with this hypothesis, as identified by (Malchukov, 2010, p. 333), is that it presumes a correlation between each parameter pair; indeed, some parameters are clearly related, such as holistic affectedness of the object and the telicity of the event. Other pairs are not related; as an example, volitionality does not correlate with telicity for intransitive verbs: unergative verbs, which take a volitional agent, are typically atelic, whereas unaccusative verbs taking an affected theme are typically telic.

Malchukov attacks the problem from a different perspective; he builds on the observation that the parameters pertain to different constituents in the clause. Thus, using the constituents as criteria, he formulates the following transitivity

scale which differentiates subsets of parameters:[1]

	A-features	V-features	O-features
(165)	animacy volitionality *kinesis*	factivity *tense/aspect*	O-affectedness, O-individuation

Adjacency on this scale signals that there is probably a systematic correlation between the parameters. For example, volitionality presupposes animacy; holistic affectedness correlates with the aspectual notion of telicity, and tense correlates with aspect and mood. Malchukov captures the correspondence between the parameters and syntactic constituents via two principles, the Relevance Principle and the Primary Actant Immunity Principle. The Relevance Principle states that transitivity parameters should preferably be encoded on the constituents to which they pertain. In combination with the transitivity scale, this principle is used to predict the locus of the alternation and thus restrict the range of possible alternations. As an example, differential object marking correlates with definiteness and affectedness of the object, whereas differential subject marking is dependent on the volitionality of the subject (Naess, 2004; de Hoop and Malchukov, 2008).

The Primary Actant Immunity Principle states that the manipulation of case marking exclusively on primary arguments should be avoided. The primary argument is the argument in a transitive clause that is encoded identically to the subject of an intransitive clause. In accusative languages, it corresponds to the nominative subject; in ergative languages, it corresponds to the absolutive object. An alternation of these arguments results in a voice alternation: accusative languages shift to the passive, whereas ergative languages shift to the antipassive. Voice alternations are more costly for generation and processing than argument alternations. Thus, accusative languages readily encode shifts in affectedness of the object, whereas ergative languages are more "comfortable" with shifts in agentivity.

[1] A and O correspond to subject and object of a transitive clause, respectively.

4.2 Previous theoretical work

Based on the above categories, authors have tried to build theories that refer no longer to individual lexical configurations, but instead formulate principles of argument realization directly in terms of the relevant categories. The general line of development of these theories is as follows: early work assumes one dimension – time or space – in which change occurs. This, however, does not account for variable telicity phenomena (see Section 4.1.1). Thus, subsequent studies add a dimension which captures the substance of the change event in the real world, referring, for example, to the internal physical structure of the changing participants. This second dimension correlates with the initial temporal dimension; aspectual phenomena are explained by this relationship. Finally, Gawron (2005) proposes a formalization of change that is no more dependent on time, but can also occur statically in space.

4.2.1 Tenny's Aspectual Interface Hypothesis

The approach proposed in Tenny (1992, 1994) is based on the following hypothesis:

(166) **Aspectual Interface Hypothesis (AIH)**: The mapping between thematic structure and syntactic argument structure is governed by aspectual properties. A universal aspectual structure associated with internal, external and oblique arguments constrains the kinds of participants that can occupy these positions. *Only the aspectual part of thematic structure is visible to syntax.* (my emphasis)

Claiming that aspect is the only kind of semantic information that is relevant for argument realization, the Aspectual Interface Hypothesis makes a very strong prediction. Tenny makes this hypothesis operative by distinguishing three types

of syntactic arguments: external, direct internal and indirect internal arguments. Each argument type is associated with a constraint on the role of the denoted participant in the event. Aspectual structure is captured by three aspectual roles − measure, path and terminus − that can be assigned to internal arguments. The measure corresponds to a participant that "measures out" the event: it provides a scale for the event to unfold and to come to its eventual endpoint; thus, incremental themes and paths are measures. Contrary to incremental themes, paths do not provide endpoints to events; these can be contributed by the terminus. Thus, the two relevant meaning components are scale and endpoint. The measure includes both of them, whereas the path and the terminus can contribute them jointly. The following illustrates:

(167) a. John ate the apple.

b. John walked to school.

The mapping between aspectual roles and syntactic arguments is mediated via three mapping constraints. Aspectual roles can only be assigned to internal arguments − the external argument does not participate in forming the aspectual structure, which is captured by the following constraint:

(168) Non-Measuring Out Constraint:

- An external argument cannot participate in measuring out or delimiting the event described by a verb. It cannot be a measure, a path or a terminus.

Direct internal arguments are selected by the verb; they are constrained by the "measuring out" constraint:

(169) Measuring Out Constraint:

- The object of a verb does not necessarily undergo change of state or motion, unless it contributes to the measuring-out of the event.
- The direct internal argument is the only overt argument which can measure out the event.
- Only one measuring out per event is possible.

This constraint is a constraint on the property of measuring out rather than on direct internal arguments, saying that only direct internal arguments may fulfill the measuring out function. Measuring out can be tested with the modifiers *halfway* and *half of*. If [V X *halfway*] and [V *half of* X] are synonymous, we get an event in which the progress through half of X corresponds to a half of the event:

(170) a. John ate half of the peach.

b. John ate the peach halfway.

Arguments that do not provide a scale or a path do not pass this test:

(171) a. John avoided half of the meeting.

b. # John avoided the meeting halfway.

Indirect internal arguments are selected by a preposition and / or take a case marker other than nominative or accusative. They receive their theta-role from the

preposition or the case marker. All VP-internal NPs that are not direct arguments are indirect arguments. The indirect argument is constrained by the "terminus" constraint:

(172) Terminus Constraint:

- An indirect argument can only participate in aspectual structure by providing a terminus for the event described by the verb. The terminus causes the event to be delimited.
- If the event has a terminus, it also has a path, whether overt or implicit.
- An event described by an overt path can have maximally one terminus.

The delimiting function can be tested by telicity. If the realization of the argument impacts on the telicity value of the predicate, the argument has a delimiting function. The following illustrates:

(173) a. He crossed *deserts* for / ??in an hour.
b. He crossed *the desert* in / ??for an hour.

(174) a. He ate *apples* for / ??in an hour.
b. He ate *the apple* in / ??for an hour.

(175) a. He avoided *(the) reunion(s)* for / ??in an hour.
b. He wandered *(the) desert(s)* for / ??in an hour.

Thus, paths (173) and incremental themes (174) impact on telicity and have a delimiting function; non-incremental themes (175) cannot delimit the event.

The interplay of terminus and path is a subtype of measuring out. The measuring out parameter is distance. An indirect argument that provides a terminus changes the aspectual properties of a sentence, transforming it into a telic event:

(176) a. Peter walked the trail for / in an hour.

b. Peter walked the trail *to the station* in / *for an hour.

Tenny extends her approach to affectedness; she reduces affectedness to the interaction between two aspectual properties, namely delimiting and measuring out. These properties are determined by the patient argument. The reformulation of affectedness in aspectual terms is motivated by structures that are broadly associated with affectedness, but may also be formed with predicates that do not pass the affectedness tests; thus, middle constructions and DP passives are possible with predicates that do not entail change, but provide a path and an endpoint:

(177) a. The desert crosses easily.

b. John's performance of the sonata

4.2.2 Universal properties of variable telicity verbs

We have seen in the previous section that some classes of verbs are ambiguous with respect to telicity; their telicity value is dependent on semantic features of their arguments:

(178) Incremental theme verbs:

a. John ate apples.

b. John ate the apple.

(179) Directed motion verbs:

a. Balls rolled down to the bottom of the hill.

b. The ball rolled down to the bottom of the hill.

(180) Degree achievements:

a. The soup cooled in 1 hour.

b. The soup cooled for 1 hour.

Authors have tried to formulate unified formal approaches that would capture these parallels despite the apparent diversity of the verbs in terms of semantic class; the basic idea was to find a structural template which would accommodate both the temporal progress of the event and the dimension of change of the relevant argument. Thus, Krifka (1989b, 1998) proposes a mereological model; he formulates a part-whole structure and defines the relations of sum, concatenation and adjacency. The model is used to align the two dimensions via a homomorphism. NP arguments are either cumulative or quantized predicates; cumulative predicates are predicates like *apples* and *water*; if the denotation of a cumulative predicate applies to two entities, it also applies to the sum of the entities. By contrast, quantized predicates, such as *two apples* or *two liters of water*, cannot describe their proper parts. If change applies to a quantized predicate, the event gets a telic interpretation; cumulative predicates yield atelic interpretations.

4.2.3 Integrating participant structure via scales

Krifka's model has served as basis for a number of accounts which explore the construct of scales to align temporal event structure with participant structure. Kennedy et al. use a model of scalar representation for adjectives (Kennedy and McNally 2005b) and extend it to events. They propose accounts for degree achievements (Hay et al., 1999; Kennedy and Levin, 2008) and incremental theme verbs (Kennedy, 2012). Beavers, starting out with the claim that most argument alternations are triggered by different degrees of affectedness, adopts scales for the representation of affectedness (Beavers, 2006). He integrates the scale as an

additional argument in the lexical representation of predicates that entail change of their arguments; this approach is used to account for verbs of possession transfer (Beavers, 2011a), resultatives (Beavers, 2012), anticausatives (Beavers and Zubair, 2011) and aspectual classes in general (Beavers, To appear). Similar approaches have been adopted by Levin (2010) for a unified approach to different semantic classes of verbs of scalar change, Caudal and David (2005) for telicity and Wechsler (2001) for resultative constructions. Finally, Gawron (2005) further generalizes the scalar approach by extending it to verbs of spatial extension; he allows change to occur relative to spatial configurations, thus neutralizing the view of change as a dynamic phenomenon that requires temporal progress.

In the following, I first describe the general structure and properties of scales. Then, I show how scales have been used in the analysis of events to establish relations between temporal and participant structure.

Structure and properties of scales

Following Kennedy and McNally (2005b), a scale s can be seen as a triple $< d, D, R >$, where:

- d is a property/dimension.
- D is set of degrees for property d
- R is an ordering on D

The prototypical linguistic expression that provides a scale is a gradable adjective. The degrees stand in an isomorphic relation with the numbers between 0 and 1.[2] As an example, consider the representation of the scale for the adjective *long*:

[2]Note that this represention does not yet include assumptions about the ontological status of degrees; in the literature, degrees have been treated, among others, as numbers, equivalence classes of objects in a model (Cresswell, 1976) and mental constructs (Bierwisch, 1989).

(181) $s_{long} =< long, \{x_d | x \in R \wedge 0 =< x =< 1\}, <>$

Scales come in different types; there are three main distinctions:

1. open vs. closed scales

2. binary vs. multi-valued scales

3. scales with fixed vs. context-dependent standard values

Scales can be open or closed; closed scales have bound values that define the minimal or maximal possible degrees to which a property can be possessed; these values correspond to 0 or 1. Open scales do not have such values; they have degrees that approach 0 or 1. However, their degree sets do not include the bounds, and there are no unique degrees that are lower or higher than all other degrees in the set. A scale may be open in one direction and closed in the other; thus, we get four logical possibilities:

- open scale, e. g. *long*:
  $< s_1 : \text{long}(x)(d_1), \ldots, s_n : \text{long}(x)(d_n) >$

- totally closed scale, e. g. *full*:
  $< s_1 : \text{full}(x)(0), \ldots, s_n : \text{full}(x)(1) >$

- lower-closed scale, e. g. *awake*:
  $< s_1 : \text{awake}(x)(0), \ldots, s_n : \text{awake}(x)(d_n) >$

- upper-closed scale, e. g. *straight*:
  $< s_1 : \text{straight}(x)(d_1), \ldots, s_n : \text{straight}(x)(1) >$

Scales can be binary or multi-valued. Binary scales consist of two states which correspond to the two endpoints, whereas multi-valued scales additionally have "intermediate" states between the endpoints. Linguistically, this distinction

roughly parallels the distinction between gradable and non-gradable adjectives in English.

In a given use, a scalar expression is evaluated against a standard value on the associated scale. Standard values may be context-dependent or fixed. Context-dependent standards are computed based on a comparison class which consists of objects similar to the one described by the argument of the scalar predicate:

(182) Mark is a **tall** basketball player. (→ *Mark is taller than basketball players usually are.*)

A fixed standard corresponds to an absolute value on the scale which is independent of the denotation of the argument; it may relate to the minimal or maximal value of a predicate:

(183) a. *maximum standard*:
#The paper is complete, I just have to write the conclusion.

b. *minimum standard*:
#The shirt is not dirty, there is just some mud on it.

The distinction between fixed and context-dependent standards correlates with the open/closed scale criterion. Kennedy and McNally (2005b) make the following generalizations: open scales have context-dependent standards, whereas closed scales have fixed standards by default. The default standard of a closed-scale adjective is associated with the minimal value if the scale is lower-bound, and with the maximal value if the scale is upper-bound or bound at both ends:

(184) a. *lower-bound scale + minimum standard*:
#The spot is not visible, but I can see a bit of it.

b. *upper-bound scale + maximum standard*:
#The paper is complete, I just have to write the conclusion

The analysis of scalar expressions

As already observed by Sapir (1944) and Bolinger (1972), the categories of scalarity and grading are not restricted to adjectives; verbs, nouns and prepositions may also denote scalar relations. This section describes the semantics of nouns, verbs and adverbs formed from gradable adjectives; they are analyzed via measure functions taking objects as arguments and returning the degrees to which a property holds of the arguments. A distinction is made between static scalar properties and dynamic properties that change over time. If change occurs, the relation must be additionally parametrized for times or be tied to an event argument.

Static measure functions apply to adjectives, Kimian state verbs[3] and nominal predicates. These expressions have the following form:

(185) $[\![P]\!] = \lambda d \lambda x.m_P(x)(d)$

The measure function m_P is defined by the property which instantiates the scale of the predicate. Thus, for a stative predicate like *resemble John*, we get the following representation:

(186) $[\![\text{resemble John}]\!] = \lambda d \lambda x.\text{resemble}(\text{John})(x)(d)$

How is d contributed? If there is no overt specification, the default is an endpoint interpretation for closed-scale expressions and a contextual interpretation for open-scale expressions; default values can be provided by the endpoint of the scale:

(187) The glass is full. $\rightarrow$ *completely full*

[3]Kimian states are states that do not provide a Davidsonian event argument; thus, *know the answer, love John* are Kimian states, whereas *sit in the classroom, lie on the floor* are Davidsonian states (cf. Maienborn 2007).

For open-scale expressions, a degree must be contextually derived; for an expression like *resemble John*, the following covert operator is applied and yields the "positive" form:

(188) $[\![pos]\!] = \lambda P \lambda x \exists d.\text{stnd}(d)(P)(\text{C}) \wedge P(x)(d)$

The function 'stnd' outputs a default degree d which is above the degree to which resembling applies to the comparison class **C** which contains objects that are judged "similar" to the argument of the predicate. The final representation of the sentence is as follows:

(189) $[\![\text{[Mark resembles John]}]\!] =$
$\exists d.\text{stnd}(d)(\text{resemble}(\text{john}))(\text{C}) \wedge \text{resemble}(\text{john})(\text{mark})(d)$

If the predicate is modified by degree morphology, the overt degree modifier saturates the degree argument:

(190) $[\![\text{ resemble John closely }]\!] = \lambda x.\text{resemble}(\text{john})(x)(closely)$

Nominal predicates that extend in space also come with measure functions; the returned degree corresponds to the quantity or size of the referent:

(191) $[\![\text{ apples }]\!] = \lambda d \lambda x.\text{apples}(x) \wedge \text{NU}(\text{apples})(x)(d)$

"Apples" takes a referent x and returns d, which corresponds to the quantity of apples represented by the referent. The function NU ("natural units") returns an appropriate measure (Krifka, 1989a). For instance, apples are naturally measured by pieces, water by liters etc.

If no quantity measure is specified, the default options for the degree argument of nominal predicates are "1" or existential boundedness. *Apples* then yields the following interpretation:

(192) $[\![\text{ apples }]\!] = \lambda x \exists d.\text{apples}(x) \wedge \text{NU}(\text{apples})(x)(d) \wedge d > 0$

Thus, only the existence of a degree greater than zero is asserted; its value is not specified. The degree argument may be instantiated via overt lexical material, e. g. by measure phrases:

(193) $[\![$ half an apple $]\!] = \lambda x.\text{apples}(x) \wedge \text{NU}(\text{apples})(0,5)$

We have seen how a static measure function returns the absolute degree to which an object possesses the property denoted by a scalar predicate; now, the measure function can be parametrized for times in order to represent changes in the degree to which an object possesses a property. Changes are conceptualized as events; the measure of change function $m_{\triangle}$ takes an object argument and an event argument and returns the difference between the degrees of the property on the object at the beginning and the end of the event:

(194) $[\![\textit{change-predicate}]\!] = \lambda d \lambda x \lambda e.m_{\triangle}(x)(e) \geq d$

This formula provides the general template for change predicates; depending on the lexical semantics of a given predicate, $m_{\triangle}$ can be instantiated by different types of measure functions and degrees. The measure of change may stem from the verb or from its arguments. Degree achievements, which are built from gradable adjectives, contain a measure of change function in their lexical semantic representation:

(195) $[\![\textit{degree-achievement}]\!] = \lambda x \lambda d \exists e.\text{TH}(e) = x \wedge m_{\triangle}(x)(e) = d$

(196) $[\![$ warm the soup 5 degrees $]\!] = \exists e.\text{TH}(e) = \text{soup} \wedge \text{warm}_{\triangle}(\text{soup})(e) = 5$ degrees

The degree achievement verb combines with a theme argument; it outputs the degree to which the theme referent changes with respect to ‘warmness’.

Incremental theme verbs do not lexicalize measures of change; their measure of change is contributed by the theme argument. We have seen that nominal predicates are associated with measure functions, which "cut out" entities of a certain size from the extension of a predicate (Krifka, 1998). Once a nominal instantiates the theme argument of an incremental theme verb, its measure function is converted into a measure of change function:

(197) $[\![$ eat half of the apple $]\!] =$
$\lambda x \exists e.\text{eat}(e) \wedge \text{TH}(e) = x \wedge \text{apple}(x) \wedge \text{NU}_{\triangle}(\text{apple})(x)(e) = -0.5$

The verb takes a theme argument whose referent has the 'apples' property. The function $\text{NU}_{\triangle}$ returns the natural measure for objects of sort 'apples' and outputs the degree to which the quantity of the object changes along this measure.

Under this approach, telicity results from the specification of a difference value. Thus, the difference value can be contributed by the verb (e. g. *straighten*), its arguments (e. g. *eat the apple*) or additional measure phrases (e. g. *lengthen the pants 5 cm*).

The predicate or its arguments may contribute a difference value specification if they are associated with a closed scale; this is the case for degree achievements derived from closed-scale adjectives, as well as for bounded incremental theme arguments:

(198) a. They are *straightening* the rope. $\nrightarrow$ They have straightened the rope.
b. John is eating *the apple*. $\nrightarrow$ John has eaten the apple.

If no difference value is specified by the predicate or its arguments, it can be contributed by additional adjuncts. Thus, explicit measure phrases automatically trigger telic events:

(199) The soup is cooling 4 degrees. $\nrightarrow$ The soup has cooled 4 degrees.

The difference value can also be indicated by degree modifiers. Some degree modifiers, e. g. *completely*, refer to the endpoint of a scale:

(200) They are straightening the rope completely. $\nrightarrow$ They straightened the rope *completely*.

Monotone-increasing degree modifiers also trigger telicity:

(201) They are broadening the investigation *significantly*. $\nrightarrow$ They broadened the investigation significantly.

Compare this with monotone decreasing modifiers:

(202) They are broadening the investigation *slightly*. $\rightarrow$ They broadened the investigation slightly.

Scales and the analysis of affectedness (Beavers, 2010)

Beavers adopts the formulation of scales proposed by Kennedy and McNally (2005b): a scale is a triple of a property, a set of degrees and an ordering relation. The themes of change predicates are associated with scales that are lexically determined by the predicate. The scale is an additional argument in the lexical representation of the predicate; thus, a change predicate can be specified as follows:

(203) $[\![\textit{change-predicate}]\!] = \lambda x \lambda e \lambda s.\text{THEME}(e) = x \wedge \text{SCALE}(e) = s$

The following illustrates:

(204) $[\![\textit{cool}]\!] = \lambda x \lambda e.\text{THEME}(e) = x \wedge \text{SCALE}(e) = \textit{temperature}$

(205) $[\![\textit{eat}]\!] = \lambda x \lambda e.\text{THEME}(e) = x \wedge \text{SCALE}(e) = \textit{volume}$

(206) $[\![\textit{walk}]\!] = \lambda x \lambda e.\text{THEME}(e) = x \wedge \text{SCALE}(e) = \textit{spatial-path}$

The scale is conceived as a mereologically complex argument in terms of Krifka's part-whole structures; thus, it comes with points, which correspond to degrees, and parts, which correspond to intervals (difference values) on the scale. Affectedness, being defined as change in a participant, is associated with a result. Thus, for an affectedness predicate ϕ, we get the following representation:

(207) $[\phi(x,s,e) \wedge result'(x,s,g,e)]$

In an event e, ϕ takes the affected argument x and specifies the scale s on which x changes. The $result'$ predicate tells that x finds itself in position g on scale s at the end of the event; it applies to situations in which there is a transition of the theme between source and goal:

(208) $\forall s \forall g \forall e.result'(s,\theta,e) \leftrightarrow [SOURCE(s,\mathrm{b},e) \wedge GOAL(s,g,e)]$
(Beavers, 2010, p. 17)

The following shows the representations for the three types of change predicates:

(209) John walked to the cafe.
$\exists e \exists s.[walking'(\mathrm{john},s,e) \wedge result'(s,\mathrm{cafe},e)]$

(210) John warmed the pie to 100 °.
$\exists e \exists s.[warming'(\mathrm{john},\mathrm{pie},s,e) \wedge result'(s,100\,^{\circ},e)]$

(211) John ate the pie.
$\exists e \exists s.[eating'(\mathrm{john},\mathrm{pie},s,e) \wedge result'(s,0,e)]$

In (209), the scale corresponds to the path of John's motion; the event results in John being at the cafe, which corresponds to the final position on the path. In (210), the scale corresponds to the temperature of the pie, which goes up to 100 °. Finally, in (211), the event progresses along the scale provided by the size of

the pie; the event signals total affectedness and thus ends up at point zero on the spatial scale.

Finally, the Movement relation is used to establish the homomorphism between scales and events:

- **Movement Relation**:

    1. Each part of the event *e* corresponds to a part of the scale *s* and vice versa.
    2. Temporal adjacency in *e* corresponds to scalar adjacency on *s*.
    3. The initial and final points in *e* are mapped uniquely to the initial and final points in *s* respectively.

4.2.4 Scalar change in stative predicates

Gawron (2005) makes a number of observations which compromise the view that change functions must be parametrized for times. First, there is a class of degree achievements that are ambiguous between the stative and the eventive reading; consider the following examples:

(212) a. The road zigzagged up the hill.

b. The halfback zigzagged up the hill.

(212a) has only a stative reading, whereas (212b) gets a dynamic reading; the choice of an interpretation depends on the quality of the figure: an extensible figure, such as a road, yields the stative interpretation. A non-extensible figure, such as a halfback, yields the dynamic reading. Thus, the verb does not lexically specify the expression of change through time.

Second, a class of stative verbs – so-called "dynamic" statives – combine with expressions that are typical for temporal change events. For example, *widen*,

on its stative reading, shows the same aspectual properties as achievements and activities:

(213) a. *nearly*-test for achievements (cf. Vendler 1957):
The crack widened *nearly* one inch at the gate.

b. *for*-adverbial test for activities:
The crack widened *for 100 yards*.

Besides, the verb allows for a path specification:

(214) The crack widened from the tower to the north gate.

Other verbs that expose this behavior are *darken, rise, redden, cool* etc. Normally, these verbs denote temporal change; however, once they combine with an additional spatial scale, they become ambiguous between the eventive and the static reading:

(215) The crack widened at the north gate.

a. *event reading: the crack is wider at a certain moment in time than it was just before that.*

b. *state reading: the crack is wider at the north gate than it is elsewhere.*

Thus, instead of limiting change to the temporal dimension, Gawron proposes a more general characterization: change is a correlation between two ordered domains; it does not need to happen along a temporal scale. Instead, other dimensions, such as space, can also act as axes of reference.

4.3 Summary

In this chapter, we have looked beyond participant structure and seen that a number of underlying semantic categories, such as aspect, affectedness and transitiv-

ity, are also relevant to argument structure and realization. I have presented some important attempts to formalize the relevant interactions, such as Tenny's Aspectual Interface Hypothesis, Krifka's mereological model and a number of recent approaches that attempt to make a link from event structure to argument structure via the construct of scales. In the next chapter, I use scales to model the semantics of the *bǎ*-construction. Taking advantage of the fact that they can be completely separated from specific participant configurations, I deploy them in a way that allows to account for well-formedness of the *bǎ*-construction while minimizing reference to argument structure.

Chapter 5

The licensing of predicates in the *bǎ*-construction

In the previous chapter, we have seen different semantic categories that have been explored in search of explanations for argument structure phenomena which could not be straightforwardly explained by participant structure. In this chapter, I will attempt to explain the licensing of the *bǎ*-construction in terms of a scalar constraint with minimal reference to argument structure, which allows to keep the analysis flexible with respect to the different argument distributions that are possible in the *bǎ*-construction (cf. Section 1.1).

The *bǎ*-construction comes with two semantic constraints:

1. **Causer requirement**: the *bǎ*-clause must contain an external *cause or actor argument*:

   (216) $[\![ba]\!] = \exists e \lambda x.\textsc{causer}(x)(e)\ldots$

   On the one hand, the presence of a causer goes hand in hand with the requirement that the overall eventuality described by the construction be eventive; thus, it excludes the use of the *bǎ*-construction for the description of

states. On the other hand, as we will see in Chapter 7.5, it pertains to the syntax-semantics interface and helps to "configure" the argument distribution in the *bǎ*-construction: the causer argument is always realized in the sentence-initial position of the *bǎ*-clause.

2. **Scale requirement**: the clause must contain a *scale s* and specify a *positive degree d* (the extent or difference value) on this scale:

   (217) $[\![ba]\!] = \exists e \lambda s \lambda d \ldots . \text{SCALE}(s)(e) \ \wedge \text{EXTENT}(d)(s)(e) \ldots$

Thus, we get the following lexical entry for *bǎ*:

(218) $[\![ba]\!] = \exists e \lambda x \lambda s \lambda d . \text{CAUSE}(x)(e) \wedge \text{SCALE}(s)(e) \wedge \text{EXTENT}(s)(d)(e)$

The only constraint on argument structure is the causer requirement, which will be considered in more detail in Chapter 7.5. In the following, I focus on the scalar constraint. In a first time, I describe the different states of affairs and linguistic expressions that satisfy the scale requirement. We will see that scales are quite flexible formal constructs that can be classified and used in a variety of ways. In a second time, I present classes of verbs which by themselves satisfy the scalar requirement of *bǎ* and, thus, can be used in the *bǎ*-construction in bare form. Finally, I present verbs that do not or only partially contribute a scale and an associated degree; as we will see, a range of additional dependents can be used to "complement" the semantics of these verbs and, thus, make them acceptable in the *bǎ*-construction.

5.1 The scale requirement

In this section, I define a concept of scales which will be used to constrain events that can be described by the *bǎ*-constructions. I build on fundamental work dis-

cussing the linguistic relevance of gradability and scalarity (Sapir, 1944; Cresswell, 1976; von Stechow, 1984; Kennedy and McNally, 2005b) and on a bulk of more recent literature on the scalar structure of events, specifically of events of change (Tenny, 1992, 1994; Jackendoff, 1996; Hay et al., 1999; Caudal and David, 2005; Kennedy and Levin, 2008; Ramchand, 2008; Koenig and Chief, 2008; Croft, 2009; Levin, 2010; Beavers, 2006, 2010; Kennedy, 2012). In these studies, scales are used to abstract over real-world properties of events, such as the spatial extent of an argument, the motion of an entity along a path etc.[1] One of the main advantages of the scale concept is that it provides a complex, but formally well-defined construct that can be used for the representation of a variety of dimensions; crucially, real-world domains can be related to each other by structural mappings between the dimensions which they represent. This potential is often exploited for the explanation of aspectual phenomena, where some gradable property of an argument can be brought into relation with the temporal course of the event.

5.1.1 Ontological and linguistic properties of scales

In a model-theoretic perspective, a scale can be seen as an abstract construct represented by a triple $< D,\ R,\ \delta >$, with D a dimension, R a set of degrees and δ an ordering on this set (Kennedy and McNally, 2005b, p. 351–355). Kennedy and McNally relate scales to individuals via measure functions: thus, a scale is associated with a measure function which is provided by its dimension. For a given individual argument, the function outputs the degree to which the scalar property holds, which situates the individual on the scale:

(219) $[\![\ \textit{John is 2 meters tall.}\ ]\!] = \mathbf{tall}(\mathbf{John}) = 2\ m$

[1] The role of paths in motions events is considered in more detail in Gawron (2005, 2006) and Zacks and Tversky (2001).

Turning to the properties that can be described by scales, we can distinguish between scales that describe the relation of an entity to its external environment, and scales that describe properties inherent to the entity. A basic scale of the first type is a path of motion, which is given by the trajectory along which the entity moves:

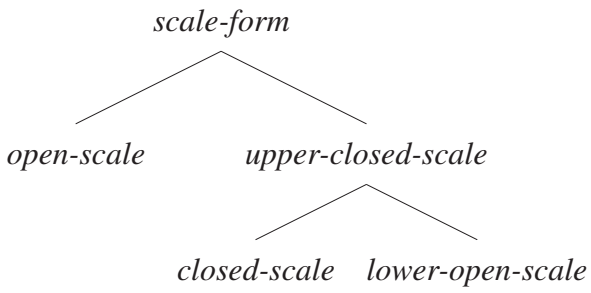
(220) John walked the trail to New York.
(*scale: trail to New York*)

"Inherent" scales can represent a large variety of properties of an entity, such as its physical size, its temperature, visual characteristics etc. Under the scalar approach, each entity can be formally represented as a set of properties, each of which can be represented on a binary or gradable scale via a degree taken from the set of degrees for this scale. Thus, an event that describes the change of an entity can be interpreted as picking a single property of the changing entity and specifying the direction and, for quantized events, the degree of its change relative to another dimension, such as time or space.

5.1.2 A typology of scales

The central linguistically relevant characteristics of scales is the existence or the absence of specific endpoints. Scales that have endpoints are closed, whereas scales without endpoints are open. A scale can be open on one end and closed on the other. I use the following classification:

(221)



I adopt the formalization of degrees and endpoints proposed in Kennedy and McNally (2005, p. 353), who assume that the set of degrees associated with a scale can be represented by a subset of the set of real numbers between 0 and 1. Thus, scales that are open on the lower end include all of those degrees that approach the limit of 0 but do not have a degree that is lower than all the other degrees in the set; scales that are closed on the lower end include such a minimal degree, namely 0. Analogously, scales that are open on the upper end include all those degrees that approach the bound of 1 without having a degree that is greater than all the others in the set; those that are closed on the upper end have a maximal degree which equals 1.

5.1.3 The linguistic specification of scales and degrees

In the previous section, we have considered formal properties of the scale construct; in the following, I focus on the linguistic specification of scales in the *bǎ*-construction. We will see that, on the one hand, scales and paths are normally only partially specified. On the other hand, the requirement of an explicit difference value specification in the *bǎ*-construction is dependent on the ontological type of the scale: thus, closed scales by default entail total traversal and do not require an additional difference value specification.

Inherent, intended and non-specified endpoints

The following examples show instantiations of the *bǎ*-construction with different endpoint specifications:

(222) a. 他 把 车 开 到 火车站。
Tā bǎ chē kāi *dào huǒchēzhàn*.
he BA car drive to train station
'He drove the car *to the train station*.'

b. 他 把 车 开 往 火车站。
Tā bǎ chē kāi *wǎng* *huǒchēzhàn*.
he ba car drive towards train station

'He drove the car *towards the train station*.'

c. 他 把 车 开-走 了。
Tā bǎ chē kāi-*zǒu* le.
he BA car drive-away PFV

'He drove the car away.'

The verb 开 *kāi* ('drive') is a verb of motion and presupposes that there is a path for the entity to move; this path may be specified in different ways and to different degrees. In (222a), the path is situated between the initial location of the car and the train station, the train station corresponding to the inherent endpoint of the event. In (222b), the train station corresponds to a point that is interpreted as a potential endpoint by the speaker: it provides a direction and a maximal endpoint to the path, but does not entail that the endpoint is actually reached. Finally, in (222c), no endpoint is specified; by virtue of the deictic complement 走 *zǒu*, the sentence specifies the initial point and the direction of the motion.

Based on the different types of endpoints, we may distinguish between two types of scale traversal, namely realis and potential traversal; realis traversal occurs in those cases where it is entailed that the inherent endpoint of the scale is reached. Potential traversal takes place for intended endpoints. Allowing "potentiality" to license the *bǎ*-construction seems not to be as compromising as it might appear at first sight: indeed, intended endpoints and potential scale traversal have been used on a par with inherent endpoints as a semantic determinant of telicity in other contexts (Dahl, 1981; Depraetere, 1995; Cappelle and Declerck, 2005).

The specification of the difference value

The lexical entry for *bǎ* requires a difference value in the semantics of the clause; this difference value can be implicit or explicit, the requirement of a specification being dependent on the formal type of the scale. Open-scale predicates require an explicit specification:

(223) 他 把 车 开 *(往 火车站)。
Tā bǎ chē kāi *(wǎng huǒchēzhàn).
he BA car drive towards train station
'He drives the car *towards the train station*.'

By contrast, closed-scale predicates can be used without an explicit difference value; in this case, it is entailed that the scale is totally traversed. The endpoint corresponds to the maximal degree:

(224) a. 我 把 这 本 书 看 了 (, ?可是 没有 看-完。)
Wǒ bǎ zhè běn shū kàn le (, ?kěshì méiyǒu kàn-wán).
I BA this CLF book read PFV but NEG.PFV read-finish.RES
'I read the whole book (? but didn't finish it).'

b. 张三 把 苹果 吃 了 (, ?可是 没有 看-完。)
Zhāngsān bǎ píngguǒ chī le (, ?kěshì méiyǒu chī-wán)..
Zhangsan BA apple eat PFV but NEG.PFV eat-finish.RES
'Zhangsan ate the apple up (? but didn't finish it).'

The following generalization determines the interpretation of the *bǎ*-construction for those cases where the predicate comes with a closed scale:

(225) **Total traversal constraint**: if the *bǎ*-construction is used with a closed-scale predicate, the scale traversal amounts to the whole scale, unless otherwise specified.

As suggested by this constraint, closed-scale predicates still allow for additional difference value specifications that override the default:

(226) a. 我 把 这 本 书 看 了 几 页。
Wǒ bǎ zhè běn shū kàn le *jǐ* *yè*.
I BA this CLF book read PFV some page
'I read *some pages* from the book.'

b. 张三 把 苹果 吃 了 一 口。
Zhāngsān bǎ píngguǒ chī le *yī* *kǒu*.
Zhangsan BA apple eat PFV one bite
'Zhangsan ate *a bite of* the apple.'

5.2 The licensing of bare verbs in the *bǎ*-construction

In this section, I present a semantic classification of verbs that can be used in the *bǎ*-construction in "bare" form[2] and show how they satisfy the scalar requirement postulated at the beginning of this chapter. Roughly, the following classes of transitive verbs can be used in the construction in bare form:

1. Discrete scale traversal:[3]

    - Motion verbs with path objects:

[2]I use the term "bare" form for verbs that are combined with aspect markers, but are not combined with additional lexical dependents that are not part of their argument structure.

[3]Following Gawron (2005), I make a distinction between discrete and spreading scales: when the entity occupies some point *d* on a discrete scale, the previous point *d-1* is no more occupied by the entity; a typical example for discrete scales is provided by paths of motion: thus, upon reaching a new position on the scale, the entity frees up the previous position. By contrast, most properties are "extended" scales: when the entity arrives at degree *d*, it continues to hold the property to degree *d-1*. In other words, a property that obtains of the entity to a degree corresponding to *d* entails that it also obtains of the entity to degree *d-1*.

  - spatial path objects, e. g. 走 *zǒu* (‘walk’), 逛 *guāng* (‘stroll’)
  - metaphorical path objects, e. g. 看 *kàn* (‘read’ / ‘watch’), 检查 *jiǎnchá* (‘examine’)
- Surface contact:
  - “punctual” surface contact, e. g. 打 *dǎ* (‘hit’), 踢 *tí* (‘kick’), 碰 *pèng* (‘touch’), 撞 *zhuàng* (‘strike’)
  - “durative” surface contact, e. g. 擦 *cā* (‘wipe’)
- Verbs of possession change:
  - transitive, e. g. 偷 *tōu* (‘steal’), 发 *fā* (‘deliver’), 借 *jiè* (‘lend’)
  - ditransitive, e. g. 给 *gěi* (‘give’), 寄 *jì* (‘send’)

2. Spreading scale traversal:

- Going out of existence, destruction, consumption, e. g. 吃 *chī* (‘eat’), 喝 *hē* (‘drink’), 破坏 *pòhuài* (‘destroy’), 烧 *shǎo* (‘burn’)
- Transformation, e. g. 煮 *zhǔ* (‘cook’), 烤 *kǎo* (‘bake’), 变成 *biànchéng* (‘turn (into sth.)’), 翻译 *fānyī* (‘translate’) , 盖 *gǎi* (‘correct’, ‘improve’)
- Creation, coming into existence, e. g. 写 *xiě* (‘write’), 盖 *gài* (‘build’)
- Verbs of property change:
  - Realis property change, e. g. 打破 *dǎpò* (‘break’), 关 *guān* (‘close’), 打开 *dǎkāi* (‘open’), 温 *wén* (‘warm’), 冷却 *lěngquè* (‘cool’)
  - Intended property change, e. g. 修 *xiū* (‘repair’), 洗 *xǐ* (‘wash’)

5.2.1 Discrete scale traversal

Motion verbs with path objects

A motion event is characterized by the physical translocation of an entity; this entity corresponds to the subject of an unaccusative or agentive motion verb (e. g. *fall, run*) or to the direct object of a caused motion verb (e. g. *put, push, send*). The translocation requires a path for the entity to move. Thus, every motion event comes with a path argument that can be characterized by its shape, length and location in space. In the description of a motion event, the path argument may be implicit or explicit. Even when it is explicit, rare are those cases in which it is fully specified (cf. Cappelle and Declerck 2005). Rather, most descriptions of motion events include only a partial specification of the path, as shown in the following examples:

(227) a. *shape*:
walk around (the city)

b. *length*:
run 5 km / a marathon

c. *initial point*:
leave (the room)

d. *final point*:
enter (the church)

The specification of endpoints in the *bă*-construction is postponed until Section 5.2.2, where we will see how deictic directional complements as well as goal phrases license the use of otherwise unacceptable verbs in the *bă*-construction. At present, we focus on motion verbs with path objects. Thus, when these verbs are used in the *bă*-construction, the sentence-initial NP refers to an agentive moving entity, whereas the *bă*-NP denotes the path of the motion event:

(228) a. 张三　　把 那 段　路　走　了。
Zhāngsān bǎ nèi duàn lù　zǒu le.
Zhangsan BA this CL　path walk PFV
'Zhangsan walked that path.'

b. 你 把 别　人　　的　　路　走　了，让　他 无 路　可 走。
Nǐ bǎ bié　rén　de　lù　zǒu le,　ràng tā wú lù　kě zǒu.
you BA other person ATTR path walk PFV　let　he no path can go
'You walked the path of somebody else and let him no path to walk.'

c. 老王　　把 他 的　书　看　了。
Lǎowáng bǎ tā de　shū　kàn le.
Laowang BA he ATTR book read PFV
'Laowang read his book.'

Paths are subtypes of scales. The paths in (228) are definite and thus provide closed scales. By virtue of the Total Traversal Constraint in (225), it is entailed that the scales are traversed totally, which gives us an extent value of 1. The following illustrates how (228a) satisfies the semantic constraint of *bǎ*:

(229) $\textsc{scale}(e) = \textbf{that.path} \wedge \textsc{extent}(s)(e) = 1 \wedge \textsc{causer}(e) = \textbf{Zhangsan}$

Ditransitive verbs of caused motion and possession

Ditransitive verbs of caused motion and possession, such as *give, send, lend, pass* etc, take three arguments: a causer that initiates the transfer, a theme that changes its location or possessor and a goal or recipient which is the target of the transfer. These verbs minimally denote change of location and intended possession. They are similar to verbs of motion in that they specify a path of motion that takes the locations of the original and the prospective possessor as endpoints.

In many languages, caused motion and possession can be expressed by the same verb; the two semantic concepts are distinguished syntactically by the dative alternation:

(230) a. *caused motion*:

John sent the book to Mary.

b. *caused possession*:

John sent Mary the book.

Thus, in (230a), Mary is the goal of the transfer, whereas in (230b), she is the recipient and prospective possessor of the transferred entity.

In Chinese, the syntactic distinction is less obvious. Two forms are interesting here: the canonical word order, in which both objects are realized postverbally, and the *bǎ*-construction, in which the transferred entity is realized as *bǎ*-NP. The following illustrates:

(231) a. 约翰 寄 了 玛丽 一 本 书。
Yuēhàn gěi le Mǎlì yīběn shū.
Yuehan give PFV Mali one CL book
'Yuehan sent Mali a book.'

b. 玛丽 把 一 本 书 给 了 约翰。
Mǎlì bǎ yī běn shū gěi le Yuēhàn.
Mali BA one CL book give PFV Yuehan
'Mali gave a book to Yuehan.'

The topicality of the internal arguments changes between the two variants: thus, in (231a), the recipient is more thematic, whereas (231b) mainly expresses something that happens to the transferred entity, thus emphasizing the affectedness meaning.

In the following examples, the *bǎ*-construction is instantiated with ditransitive verbs that denote caused possession or caused motion to a specific recipient:

(232) a. 他 把 求 准确 地 传递 给 守门员。
Tā bǎ qiú zhǔnquè de zhuǎndì gěi shòuményuán.
he BA ball neat ADV pass to goalkeeper
'He passed the ball neatly to the goalkeeper.'

b. 他 把 车子 还 给 人家。
Tā bǎ chēzi huán gěi rénjiā.
he BA car return to person
'He returned the car to the person.'

c. 你 先 把 工作 交代 给 新手。
Nǐ xiān bǎ gōngzuò jiāodài gěi xīnshǒu.
you first ba work transfer to new.worker
'You should first transfer the work to the new worker.'

Following Beavers (2011a), I interpret events of possession transfer as changes of location which happen on a binary path. Thus, the path can be represented by its two endpoints. The following schematically shows the representation of the path for (232a):

(233) $\exists e \exists p.path'(e) = p \wedge init(p)(\textbf{player}) \wedge fin(p)(\textbf{goalkeeper})$

The player and the goalkeeper define the two endpoints of a path which is traversed by the theme, the ball. Assuming this representation for the path p, the instantiation of the semantic constraint of *bǎ* is as follows:

(234) $pass'(e) \wedge \text{CAUSER}(e) = \textbf{player} \wedge \text{SCALE}(e) = p \wedge$
$\text{EXTENT}(e) = \mathbf{1}$

Surface contact verbs

Verbs of surface contact, such as *hit, strike, trap, wipe, scrub* etc., have the common meaning components of contact, motion and force transmission (Gao and

Cheng, 2003); optionally, they may include meaning components such as sound source, frequency and instrument. I distinguish between "punctual" and "durative" surface contact, the distinction being based on aspectual properties and the types of scales involved. Both subclasses of verbs are commonly used in the *bǎ*-construction.

"Punctual" surface contact verbs, such as *hit* and *strike*, involve a body part or an instrument travelling towards an object and transmitting force to it; they are similar to motion in that they involve motion that ends at a given point, namely at the point where the surface contact happens. The following examples illustrate punctual surface contact verbs in the *bǎ*-construction:

(235) a. 老王 把 狗 打 了。
Lǎowáng bǎ gǒu dǎ le.
Laowang BA dog hit PFV
'Laowang hit the dog.'

b. 汽车 把 人 撞 了。
Qìchē bǎ rén zhuàng le.
car BA person strike PFV
'The car struck the person.'

In these cases, the scale is given by the path that is traversed by the body part or instrument of the action; it starts at the original location and ends at the target of contact. Punctual surface verbs are telic on their default reading; they become atelic on iterative readings.

"Durative" surface contact verbs, such as *scrub, wipe* and *rub*, involve a permanent contact with the surface; as described in Rappaport Hovav and Levin (2002), these verbs do not entail a change of state, but may have inherent, understood scales. Consider the following sentence:

(236) 我 把 桌子 擦 了。
Wǒ bǎ zhuōzi cā le.
I BA table wipe PFV
'I wiped the table.'

According to Rappaport Hovav and Levin, *wipe* comes with two scales that might potentially measure out change in the event. One potential scale is the spatial scale provided by the surface of the undergoer; another potential scale is a property of the undergoer whose change is intended, which in our case presumably corresponds to the cleanliness of the table (Talmy, 2000).

Not all durative surface contact verbs have an "understood" scale which represents the property whose change is intended. This relates to a general observation by Beavers, who observes that affectedness verbs have different ranges of possible outcomes (Beavers, 2010); the more restricted the types of possible result, the stronger the affectedness meaning expressed by the verbs. As expected on the present analysis, those verbs that do not have understood scales cannot be used in the *bǎ*-construction in bare form. The following two sets of examples illustrate verbs which have rather versatile results and require the presence of a specifying complement:

(237) 梳 *shū* ('comb'):

a. 把 头发 梳-顺
bǎ tóufa shū-*shùn*
BA hair comb-arranged.RES
'*arrange* the hair by combing it'

b. 把 头发 梳-上-去
bǎ tóufa shū-*shàng-qù*
BA hair comb-UP-FROM.HERE
'put the hair *up* (using a comb)'

c. 把 头发 梳-成 辫子
bǎ tóufa shū-*chéng* *biànzi*
BA hair comb-TURN.INTO pigtail
'comb the hair *into a pigtail*'

d. 把 她 的 头发 梳-成 公主头
bǎ tā de tóufa shū-*chéng* *gōngzhǔ-tóu*
BA she ATTR hair comb-TURN.INTO princess-head
'comb her hair to make it look like a princess'

(238) 搓 *cuō* ('rub'):

a. 小心 一点儿, 别 把 东西 搓-坏 了!
Xiǎoxīn yīdiǎnr, bié bǎ dōngxī cuō-*huài* le!
careful a-bit, NEG BA stuff rub-broken.RES PFV
'Take care, don't *damage* the stuff by rubbing it.'

b. 她 用力 大 把 病人 的 皮肤 搓-破 了.
Tā yònglì dà bǎ bìngrén de pífu cuō-*pò* le.
she force big BA patient ATTR skin rub-damage.RES PFV
'She acted violently and *damaged* the skin of the patient.'

c. 把 两 手 搓-热
bǎ liǎng shǒu cuō-*rè*
BA two hand rub-warm.RES
'rub both hands until they become *warm*'

d. 把 面包 搓-成 球
bǎ miànbāo cuō-*chéng* *qiú*
BA bread rub-TURN.INTO ball
'rub the bread *into balls*'

Thus, we see that the *bǎ*-construction more readily allows for bare verbs which have "inherent" scales that accommodate the results; verbs which have various possible outcomes require an overt specification of the result.

5.2.2 Spreading scale traversal

Verbs of creation, consumption and destruction

These verb classes embrace "traditional" incremental theme verbs in which the size of the undergoer argument measures out the event; the aspectual value of the event descriptions is dependent on the quantization of the undergoer: if the undergoer is quantized, the event is telic. A non-quantized undergoer yields an atelic interpretation:

(239) a. *quantized undergoer and telic event*:

John ate the apple.

b. *non-quantized undergoer and atelic event*:

John ate apples.

When these verbs are used in the *bǎ*-construction, the undergoer corresponds to the *bǎ*-NP and, thus, is definite or specific; the events are interpreted as telic, and the scale associated with the *bǎ*-NP is a closed scale:

(240) a. 他 把 信 写 了。
Tā bǎ xìn xiě le.
he BA letter write PFV
'He wrote the letter.'

b. $write'(e) \wedge \text{ACT}(e) = \textbf{he} \wedge \text{SCALE}(e) = \textbf{size(letter)} \wedge$
$\text{EXTENT}(e) = \mathbf{1}$

Verbs of destruction or consumption describe the going out of existence of an entity:

(241) a. 老王 把 蛋糕 吃 了。
Lǎowáng bǎ dàngāo chī le.
Laowang BA cake eat PFV
'Laowang ate the cake.'

b. $eat'(e) \wedge \text{ACT}(e) =$ **Laowang** $\wedge \text{SCALE}(e) =$ **size(cake)** $\wedge$ $\text{EXTENT}(e) =$ **-1**

(242) a. 我们 把 纸 烧 了。
Wǒmen bǎ zhǐ shǎo le.
we BA paper burn PFV
'We burned the paper.'

b. $burn'(e) \wedge \text{ACT}(e) =$ **he** $\wedge \text{SCALE}(e) =$ **size(paper)** $\wedge$ $\text{EXTENT}(e) =$ **-1**

Verbs of property change

Verbs of property change, such as *cool, widen, straighten* etc., largely correspond to the category of so-called "deadjectival verbs" (Dowty 1989, p. 206) or "degree achievements" (Abusch, 1986; Hay, Kennedy and Levin, 1999; Lehrer, 2007; Kennedy and Levin, 2008). These verbs are derived from gradable adjectives and denote a change in the degree to which the property denoted by the underlying adjective obtains of an entity. Just as incremental theme and motion verbs, degree achievements exhibit variable telicity effects. However, whereas telicity for verbs of the former two classes is determined based on the boundedness of their incremental theme or path argument, the telicity of degree achievements is independent of their arguments. Thus, the following sentence is ambiguous between a telic and an atelic interpretation, the correct reading being deduced based on context (Hay et al. 1999, p. 10–12):

(243) The soup cooled (in / for 5 min).

Hay et al. (1999) and Kennedy and Levin (2008) find that the telicity of property change verbs is determined by the type of scale which is provided by the underlying adjective. Closed scales yield telic interpretations:

(244) John straightened the rope in / *for 5 min.

The interpretation of open-scale degree achievements is less obvious; thus, if the context does not contain a difference value, telic readings are normally odd:

(245) The gap between the boats widened for / *in 5 min.

Still, in some cases, the telic reading is available, as shown in (243): *cool* provides an open scale, but the verb is ambiguous with respect to telicity. Kennedy and Levin (2008) explain this on a pragmatic level by assuming that some degree achievements come with an "understood" standard of change which provides an endpoint on the scale and thus licenses the telic reading.

As can be expected from these facts, only part of property change verbs can be used in the *bǎ*-construction in bare form. Property changes along closed scales are unproblematic. They entail that the endpoint is reached and thus satisfy the scalar requirement of *bǎ*:

(246) a. 我 把 绳子 拉直 了。
Wǒ bǎ shéngzi lāzhí le.
I BA rope straighten PFV
'I straightened the rope.' (CCL)

b. $straighten'(e) \wedge \text{SCALE}(e) = \textbf{straight}(\textbf{rope}) \wedge \text{EXTENT}(s)(e) = \textbf{1}$

By contrast, open scale degree achievements normally require additional bounding dependents:

(247) a. 他 把 酒 温 *(到 50 °C)。
Tā bǎ jiǔ wén *(dào 50 °C).
he BA wine warm to 50 °C
'He warmed the wine to 50 °C.' (HSK8000)

b. 物理学家 把 水银 冷却 *(到 零下 269 °C)。
Wùlǐxuéjiā bǎ shuǐyín lěngquè *(dào língxià 269 °C).
chemician BA quicksilver cool to below zero 269 °C
'The chemician cooled the quicksilver to -269 °C.' (CCL)

Finally, the following two examples show *bǎ*-constructions with open-scale degree achievements that are acceptable in bare form:

(248) a. 她 用 热水器 把 水 热 了。
Tā yòng rèshuǐqī bǎ shuǐ rè le.
she us water heater BA water heat PFV
'She heated the water with the water heater.'

b. 一 场 大雨 把 粮食 全 淋湿 了。
Yī chǎng dàyǔ bǎ liángshi quán línshi le.
One CLF rain BA grain all wet PFV
'The rain wetted all the grain.' (HSK8000)

Admitting context-dependent standards of change such as those used by Hay et al. (1999) and Kennedy and Levin (2008), these examples can get bounded interpretations: in (248a), the event can be interpreted as bounded by the boiling point of the water. In (248b), the standard of change is less obvious, and the sentence might be usable only in a specific context, e. g. signalling that the grain is too wet to be worth keeping it.

5.3 The licensing function of additional verbal dependents

In this section, I first present a range of additional verbal dependent (AVD) types which license the *bǎ*-construction; once the lexical predicate in a *bǎ*-sentence contains one of these AVDs, the sentence is well-formed since the selectional restrictions of the AVD sufficiently constrain possible verbs. At the end of the following section, I show how AVDs license a range of verb classes that are not acceptable in the construction in bare form.

5.3.1 Types of additional verbal dependents

Resultative complements

As described in Section 1.2, there are two possibilities for the surface realization of resultative complements in Chinese: on the one hand, they can be realized as a complement introduced by the particle 得 *de*:

(249) 老王　把 我 烦　*(得 都 不 想 说-话 了).
Lǎowáng bǎ wǒ fán *(de dōu bù xiǎng shuō-huà le).
Laowang BA me annoy DEG EMPH NEG want speak PFV
'Laowang annoyed me to the extent of (me) not wanting to speak anymore.'

On the other hand, the resultative can be appended directly to the verb, thus forming a so-called "resultative compound" (动结式 *dòngjiéshì*).

(250) 老王　把 我 烦*(死) 了.
Lǎowáng bǎ wǒ fán*-(sǐ) le.
Laowang BA me annoy-dead.RES PFV
'Laowang annoyed me to death.' (*metaph.*)

We have seen that resultatives can be lexically empty or contentful; both types are possible in the *bǎ*-construction:

(251) a. *contentful resultative*:

张三　把 自行车 骑-*(坏) 了。
Zhāngsān bǎ zìxíngchē qí-huài le.
Zhangsan BA bike ride-broken.RES PFV
'Zhangsan rode the bicycle and it broke as a result.'

b. *"empty" resultative*:

他 把 苹果 吃(-完) 了。
Tā bǎ píngguǒ chī(-wán) le.
he BA apple eat-finish.RES PFV
'He ate up the apple(s).'

The contentful resultative in (251a) has a licensing function; by contrast, the empty resultative in (251b) does not impact on grammaticality. The explanation can apparently be found in the selectional restrictions of the resultatives: we have seen that the function of lexically empty resultatives is to assert the completion of an event; thus, for a telic event description, they assert that the endpoint has actually been reached. However, telic events are *per se* acceptable in the *bǎ*-construction, as all kinds of endpoint, including potential and intended endpoints, license the *bǎ*-construction (cf. Section 5.1). Thus, the semantic contribution of an empty resultative – the entailment that the endpoint has actually been reached – does not impact on the acceptability of the construction.

Contentful resultatives always license the *bǎ*-construction. Lexically, they contribute a scale which constitutes the dimension of change. Grammatically, the resultative signals that the property holds of the subject to new degree which corresponds to the inherent or contextually understood endpoint of the scale. For example, the resultative in (251a) comes with a scale **broken** = $< broken, \{0,1\}, <>$ and yields the following semantic representation for the sentence:

(252) $ride'(e) \wedge \text{CAUSER}(e) = \textbf{Zhangsan} \wedge \text{UNDERGOER}(e) = \textbf{bike} \wedge \text{SCALE}(e) = \textbf{broken} \wedge \text{EXTENT}(e) = \textbf{1}$

Directional complements

Directional complements can be used to encode caused-motion events in the *bǎ*-construction:

(253) a. 老王 把 车 开-进-来 了.
Lǎowáng bǎ chē kāi-*jìn-lái* le.
Laowang BA car drive-INTO-TO.HERE PFV
'Laowang drove the car in.'

b. 老王　　把 小李　拉-出-去　　了.
Lǎowáng bǎ Xiǎolǐ lā-*chū*-*qù*　　le.
Laowang BA Xiaoli pull-OUT-FROM.HERE PFV
'Laowang pulled Xiaoli out from here.'

The sentence-initial NP corresponds to the subject of the main verb, whereas the *bǎ*-NP is a theme that moves along the path provided by the directional complement. In Section 1.2, we have seen that directional complements require a bounded path. A nondeictic directional complement that follows the main verb must be followed either by a deictic directional, which identifies the speaker as an endpoint, or by a goal NP:

(254) 老王　　把 车　开-进*(-去/车房)　　了.
Lǎowáng bǎ chē kāi-jìn*(-qù/chēfáng)　　le.
Laowang BA car drive-into-TO.HERE/garage PFV
'Laowang drove the car in here / into the garage.'

Thus, directional complements require a path-bounding element. A saturated directional complement thus satisfies the scalar constraint on the *bǎ*-construction; this is shown in the following representation of the two variants in (254):

(255) a. $drive'(e) \wedge \text{CAUSER}(e) = \textbf{Laowang} \wedge \text{SCALE}(e) = path'(\textbf{speaker}, \mathbf{g}_c) \wedge$

$\text{EXTENT}(e) = \mathbf{1}$

b. $drive'(e) \wedge \text{CAUSER}(e) = \textbf{Laowang} \wedge \text{SCALE}(e) = path'(\mathbf{s}_c, \textbf{garage}) \wedge$

$\text{EXTENT}(e) = \mathbf{1}$

Two additional remarks are in order about the main verb in *bǎ*-constructions with directional complements: first, contrarily to the above examples which describe direct causation of motion, motion can also be caused or enabled indirectly.

In this case, the main verb denotes an action which may be completely unrelated to the concept of motion:

(256) a. 他 把 孩子 偏-出-去 了.
Tā bǎ háizi *piàn*-chū-qù le.
he BA child cheat-OUT-FROM.HERE PFV
'He cheated the child out from here.'

b. 我 把 老王 叫-进-来 了.
Wǒ bǎ Lǎowáng *jiào*-jìn-lái le.
I BA Laowang call-INTO-TO.HERE PFV
'I called Laowang in.'

Second, the main verb may be a so-called "dummy" verb which leaves the action that caused the motion underspecified:

(257) 我们 把 他 弄-来 了.
Wǒmen bǎ tā *nòng*-lái le.
we BA he make-TO.HERE PFV
'We brought him here.'

In sum, we see that directional complements provide a bounded path which is travelled by the entity denoted by the *bǎ*-NP; as shown in the following, explicit goal or recipient arguments are another way of providing a path of motion and, thus, licensing the *bǎ*-construction.

Goal arguments

Goal arguments provide a delimitation for a path; the relevant path has a contextually given source as initial point and ends at the point described by the goal argument. We have already seen how the *bǎ*-construction can be used with verbs of caused possession or motion that include goal or recipient arguments in their

inherent valence list (cf. Section 5.1). As shown in the following, additional PP adjuncts that contribute a realis or intended goal also license the *bǎ*-construction:

(258) a. *realis goal*:

司机 把 管理 送 *(到 飞机场)。
Sījī bǎ guǎnlǐ sòng *(*dào fēijīchǎng*).
driver BA manager deliver to airport

'The driver takes the manager to the airport.'

b. *intended goal*:

老王 把 车 开 *(往 火车站)。
Lǎowáng bǎ chē kāi *(*wǎng huǒchēzhàn*).
Laowang BA car drive towards station

'Laowang drives the car towards the train station.'

The representations are as follows:

(259) $deliver'(e) \wedge \text{CAUSER}(e) = \textbf{driver} \wedge \text{UNDERGOER}(e) = \textbf{manager} \wedge$
$\text{SCALE}(e) = path'(\mathbf{s}_c, \textbf{airport}) \wedge \text{EXTENT}(e) = \mathbf{1}$

(260) $drive'(e) \wedge \text{CAUSER}(e) = \textbf{Laowang} \wedge \text{UNDERGOER}(e) = \textbf{car} \wedge \text{SCALE}(e) =$
$path'(\mathbf{s}_c, \textbf{station}) \wedge \text{EXTENT}(e) = \mathbf{1}$

Punctualizers

I use the term "punctualizer" as an umbrella term for a range of structures that express that an action is performed "a little bit" (Li and Thompson, 1981a, p. 232); some authors call this the "tentative" or "delimitative" aspect. Chinese has three means to express this type of volatility of an event, which also license the *bǎ*-construction:

- Verb reduplication (cf. Section 1.2.2):

(261) 她 把 支票 看 了 看, 就 把 它 放进 口袋-里。
Tā bǎ zhīpiào *kàn le kàn*, jiù bǎ tā fàngjìn kǒudài-lǐ.
she BA ticket look PFV look, then BA it put-enter pocket-IN
'She had a look at the ticket and then put it into her pocket.'

- The event classifier 一下 *yīxià* ('a bit'):[4]

(262) 我 把 事情 考虑 了 一-下.
Wǒ bǎ shìqìng kǎolǜ le *yī-xià*.
I BA matter reflect PFV one-bit
'I reflected a bit on the matter.'

- Other verb-specific event classifiers:

(263) a. 我 叫 出租车 时 总 要 把 司机 看 一-眼.
Wǒ jiào chūzūchē shí zǒng yào bǎ sījī kàn *yī-yǎn*.
I call taxi when always must BA driver look one-eye
'Each time I call a taxi I first have a look at the driver.'

b. 阿明 把 狗 踢 了 一-脚.
Āmíng bǎ gǒu tí le yī-jiǎo.
Aming BA dog kick PFV one-foot
'Aming kicked the dog.'

Misfortunately, there are yet not many studies on the semantics of punctualizers; what seems to be relevant here is that they do not have a purely temporal meaning. According to the intuition of the consulted native speakers, they also modify non-temporal aspects of the event, thus alleviating general pragmatic factors such as the involvement and intentionality of the agent, the overall consequences of the event etc.

[4] 一下 *yīxià* should be contrasted to a number of other modifiers that merely signal short duration and, thus, can also apply to states, such as 一回儿 *yīhuír*, 一阵子 *yī zhēnzi* etc.

Manner adverbs with degree modifiers

Manner adverbs apply to events; in most cases, they come with an inherent scale. In the *bǎ*-construction, they require an additional degree modifier, which ensures the contribution of a difference value:

(264) 张三　　把 这 事　想　*(得　太 悲观)。
Zhāngsān bǎ zhè shì xiǎng *(de tài bēiguān).
Zhangsan BA this affair think DEG too pessimistic
'Zhangsan thinks too pessimistically about this affair.'

Degree modifiers such as *too* provide extents that render the difference between some contextually provided standard of comparison and the actual degree to which the relevant property obtains (Kennedy and McNally, 2005b). Thus, according to Meier (2003), *too* signals a discrepancy between the actual degree and the maximal degree that is judged to be acceptable by the speaker (Meier's "upper bound of admissibility", p. 70). Representing the semantics of *too* as difference value between the acceptable degree $\mathbf{d}_a$ and the real degree $\mathbf{d}_r$, (265) shows how (264) satisfies the semantic constraint of *bǎ*.

(265) $think'(e) \wedge \text{CAUSER}(e) = \mathbf{Zhangsan} \wedge \text{SCALE}(e) = \mathbf{pessimistic} \wedge$
$\text{EXTENT}(e) = \mathbf{diff}(\mathbf{d}_a)(\mathbf{d}_r)$

5.3.2 Additional verbal dependent hypothesis

In the last section, I have shown how additional verbal dependents license the *bǎ*-construction by virtue of their scale-contributing and delimiting semantics. This is summarized by the following hypothesis:

(266) **AVD hypothesis**: Any well-formed combination of a transitive verb with an additional dependent of one of the following types is acceptable in the *bǎ*-construction:

- Resultative complement
- Directional complement, predicated of the *bǎ*-NP
- Goal argument
- Manner adverb with degree modifier

In the following, I illustrate how this hypothesis works for three classes of verbs that cannot be used in the construction in bare form, namely verbs of motion using a vehicle, psychological verbs and verbs of perception.

5.3.3 Verbs that can be licensed via the AVD hypothesis

Motion using a vehicle

Verbs of motion using a vehicle realize the vehicle in object position:

(267) a. 她 开 了 车。
Tā kāi le *chē*.
she drive PFV car
'She drove the car.'

b. 老王 骑 了 马。
Lǎowáng qí le *mǎ*.
Laowang ride PFV horse
'Laowang rode the horse.'

As they do not provide a scale, they are not acceptable in bare form in the *bǎ*-construction:

(268) a. *她 把 车 开 了。
Tā bǎ chē kāi le.
she BA car drive PFV
'She drove the car.'

b. *老王 把 马 骑 了。
Lǎowáng bǎ mǎ qí le.
Laowang BA horse ride PFV
'Laowang rode the horse.'

Now, appropriate additional dependents can "repair" the sentences. Verbs of vehicle motion can be mainly complemented by two types of dependents which contribute different scales. On the one hand, they combine with goal PPs or directional complements that contribute and delimit a path of motion:

(269) a. 他把 车 开 到 火车站。
Tā bǎ chē kāi dào huǒchēzhàn.
he BA car drive to train station
'He drove the car to the train station.'

b. 老王 把 自行车 骑-回-来 了。
Lǎowáng bǎ zìxíngchē qí-huí-lái le.
Laowang BA bike ride-BACK-TO.HERE PFV
'Laowang rode the bike back.'

On the other hand, by virtue of having the vehicle in object position, they can contribute a scale that describes the state of the object. The following examples show *bǎ*-constructions in which the vehicle undergoes a change of state as a result of its usage:

(270) a. 他 把 马 骑-倒 了。
Tā bǎ mǎ qí-dào le.
he BA horse ride-fall.RES PFV
'He rode the horse until it fell over.'

b. 怎样 可以 快速 地 把 车 开坏?
Zěnyàng kěyǐ kuàisù de bǎ chē kāi-huài?
how can quickly ADV BA car drive-broken.RES
'How to drive a car in order to damage it quickly?'

Psych verbs

Chinese has a number of lexical items that can be used either as an adjective a psychological state, or as a verb that expressese the coming about of this state; the disambiguation happens based on the context in which the item is used. In the *bǎ*-construction, these items are used in their verbal function. They are commonly combined with resultative complements:

(271) a. 今天 的 课 把 我 累-死 了。
Jīntiān de kè bǎ wǒ lèi-sǐ le.
today ATTR class BA me tired-dead.RES PFV
'Today's class made me tired to death.'

b. 老王 把 我 烦 得 都 不 想 说话 了。
Lǎowáng bǎ wǒ fán de dōu bù xiǎng shuōhuà le.
Laowang BA me annoy DEG GEN NEG want speak PFV
'Laowang annoyed me to such an extent that I didn't want to speak anymore.'

Grammatically, these sentences should be interpreted as leading to a result on an additional dimension, such as the property of being dead for (271a) and the property of not wishing to speak anymore for (271b). However, the semantics seems not to be exactly a resultative one; instead, it appears that the resultatives

semantically act as degree modifiers, describing the final degree of a change in the property denoted by the psych verb.[5] Thus, if we opt for resolving the metaphors provided by the resultative complements which actually denote very high degrees, a sentence like (271a) satisfies the constraint of *bă* as follows:

(272) $\text{CAUSER}(e) = \textbf{today's class} \wedge \text{SCALE}(e) = \textbf{tired} \wedge \text{EXTENT}(e) = \textbf{extreme}$

Perception verbs

Perception verbs are known as a highly polysemic class (Viberg 1984, Ibarretxe-Antunano 1999, Gisborne 2010, *i. a.*). Having a basic sense of physical perception, many of them allow extensions to other meanings, especially into the cognitive domain; for example, many languages use the verb *see* with a meaning of "understanding", whereas *listen* often extends to "obedience" (Viberg, 1984). In order to find a semantic basis for the possible meaning extensions, authors have tried to explain the semantics of perception verbs in terms of more fundamental cognitive domains, such as the domains of space and force dynamics. Thus, Gruber (1967), basing himself on observations about the combinatorial potential of perception verbs, analyzes them on a par with motion verbs. This approach is also supported by Jackendoff (1983), who uses spatial notions to account for argument structure phenomena in fields other than space and motion. Gisborne (2010) analyzes a number of perception verbs as motion of the perceiving organ, for example the gaze in the case of vision, towards the percept. Similarly, the "seeing is touching, eyes are limbs" metaphor by Lakoff (1995, p. 137) situates verbs of vision in a domain derived from force dynamics.

[5]This is reminiscent of an observation made by Katz (2003), who considers combinations of psych verbs or verbs of emotion (e. g. *love passionately*, *hate to death*) with manner adverbs. He observes that the manner adverbs are interpreted rather as degree modifiers than as genuine manner specifications.

The following examples show *bǎ*-constructions with perception verbs. The verbs are combined with resultative complements that signal the "attainment" of perception:

(273) a. 老王 把 狗 看-见 了。
Lǎowáng bǎ gǒu kàn-jiàn le.
Lǎowáng BA dog see-attain.RES PFV
'Laowang saw the dog.'

b. 我 把 老王 的 声音 听-到 了。
Wǒ bǎ Lǎowáng de shēngyīn tīng-dào le.
me BA Laowang ATTR voice listen-arrive.RES PFV
'I heard Laowang's voice.'

I follow Gisborne (2010) in explaining these verbs in terms of a metaphorical movement of the perceiving organ (or body part, in Gisborne's terms) to the percept; the fact that perception verbs in Chinese are often used with the locative resultative 到 *dào* ('arrive') which signals that an object has actually been perceived provides further support for this conception of the semantics of perception verbs. Thus, the additional dependents that signal "attainment" contribute an extent value for the path traversed by the perceiving organ and thus license the verbs in the *bǎ*-construction.

5.4 Summary

In this chapter, I have introduced the main semantic constraint on *bǎ*. According to this constraint, the *bǎ*-construction must contain a causer argument, a scale and an extent specification on this scale. After laying out the basic assumptions about the semantics of scales and difference values, I have shown how the scalar requirement can be satisfied by the lexical predicates in the *bǎ*-construction. We

have seen that a range of verb classes are inherently scalar; thus, their members satisfy the scale requirement of *bă* and can be used in the construction in bare form. On the other hand, a number of verbs do not contain scales in their semantic representation. Still, these verbs can be "saved" by additional dependents that contribute the relevant relations and thus satisfy the semantic constraint of *bă*.

Chapter 6

The HPSG framework

In this chapter, I introduce the framework of Head-driven Phrase Structure Grammar (HPSG, cf. Pollard and Sag 1987, 1994; Müller 2007) which will be used in the analysis. Along with other frameworks such as Lexical Functional Grammar (LFG, cf. Bresnan 2001; Dalrymple 2001), Functional Unification Grammar (FUG, cf. Kay 1984) and Arc-Pair Grammar (Johnson and Postal, 1980), HPSG belongs to the family of constraint-based frameworks, which mainly oppose themselves to transformational grammar theories such as GB (Chomsky, 1981, 1982, 1986) and Minimalism (Chomsky, 1993). They do not use transformations, thus being compatible with the incrementality of language processing as carried out by language users. They are surface-oriented and maximally get rid of deep structural principles in order to reduce the load of theory-internal assumptions. Finally, the autonomy of syntax is abolished; constraint-based frameworks make use of a parallel representation of different linguistic levels such as phonology, syntax, semantics and pragmatics and abundantly use interface constraints to model the dependencies between these levels (Kuhn, 2007).[1]

[1] A detailed discussion of a range of further distinctions that stem from the formalisms underlying the two directions can be found in Pullum and Scholz (2001).

Pollard and Sag (1994, p. 12–14) evaluate the two theoretical stances with respect to a range of criteria of evaluation for a linguistic theory. The major criterion is decidabiliy: for a given expression, it must be determinable from grammar whether this expression is a well-formed linguistic expression. Additional factors stem from the ambition of linguistic theory to model human language processing; thus, a linguistic theory ideally should be compatible with facts such as the incrementality of language processing, the parallel use of linguistic and extra-linguistic knowledge, the quasi-simultaneous access to different levels of linguistic information and the neutrality of the information with respect to different kinds of processing activities. The major advantage of constraint-based frameworks over transformational formalisms seems to be their relative neutrality: they make no commitments about a priority ordering between the levels of representation and the kind of processing activity, which allows to formulate constraints on a case-to-case basis. Besides, as discussed by Pullum and Scholz (2001), a theory formulated in terms of constraints provides additional flexibility in that it allows to capture the structure of expression fragments, different degrees of ungrammaticality as well as diachronic changes.

In the following, I describe the theoretical foundations of the framework. More detailed introductory presentations can be found in Pollard and Sag (1987, 1994), Levine and Meurers (2006) and (Müller, 2007, To Appear 2015). For general characterizations of unification-based frameworks, the reader may refer to Shieber (1986) and Pollard (1996). A formalization of the underlying feature structure logic can be found in Carpenter (1992). Different formal versions of the formalism are proposed in King (1989, 1994), Pollard (1999) and Richter (2004); the present analysis uses Richter's formalization.

6.1 Basic notions and the format of description

6.1.1 Signature, formal language and theory

A formal grammar can be seen as a pair containing an ontology which provides the means for the description of linguistic objects (the *signature*), and a grammar which contains the descriptions of well-formed linguistic objects (the *theory*).

The signature

The signature models the empirical domain of linguistic signs; it is presented in the form of an ontology which contains the possible types and properties (*features*) of linguistic signs.

Formal language

Linguistic objects are modelled with *typed feature structures*. Typed feature structures are directed graphs; each feature structure belongs to a type and contains a set of feature-value pairs:

(274)
$$\begin{bmatrix} \textit{type} \\ \text{FEATURE 1} & \textit{value 1} \\ \text{FEATURE 2} & \textit{value 2} \\ \dots \\ \text{FEATURE N} & \textit{value n} \end{bmatrix}$$

The values of the features may be either atomic or complex; complex values are themselves feature structures.

Linguistic objects can be described (or *constrained*) by feature structure descriptions or so-called *attribute-value matrices* (AVMs), which contain partial information about the object.

Feature structures and feature structure descriptions allow for the specification of *token-identity* of the values of different features: in this case, two features or feature paths point to the same node:

(275)
$$\begin{bmatrix} \textit{type} \\ \text{FEATURE1}\ \boxed{1} \\ \ldots \\ \text{FEATURE2}\ \boxed{1} \end{bmatrix}$$

Tags such as $\boxed{1}$ are treated as variables that are associated with feature values. The identification of tags on two feature values is called *structure-sharing*.

Feature values are constrained by types that are organized in a the signature. The Closed World Assumption (Gerdemann and King, 1994; Gerdemann, 1995) states that the most specific subtypes partition the entire domain, which enforces that each object can be classified under some type. In order for a feature structure to be well-formed, its feature-value pairs must satisfy the following three conditions (Pollard and Sag, 1994, p. 17–18):

(276) **Conditions on the well-formedness of typed feature structures:**

1. Well-sortedness: each feature has a type constraint on its value.
2. Total well-typedness: the features in a feature structure are imposed by its type specification; every feature from the type specification must be present in the feature structure of an object of this type.
3. Sort-resolution: every node must be assigned a maximal type.

Theory

Typed feature structures that fulfill the conditions described in (276) are well-formed models of linguistic objects. However, they are not necessarily models of well-formed linguistic objects. The well-formedness, i. e. acceptability, of a

linguistic object is determined by the theory, which consists of a set of constraints that must be satisfied by the linguistic object. These constraints are stated as descriptions of typed feature structures which partially constrain the information in these models. Thus, the set of well-formed linguistic objects is modelled by the subset of well-formed feature structures that satisfy all feature structure descriptions in the grammar.

6.1.2 Basic *sign* structure

In HPSG, every real-world linguistic object is a sign; the concept of a sign reflects Saussure's idea of the minimal independent unit relating form and function (Saussure, 1916). A sign is a collection of information on different linguistic levels, such as phonology, syntax, semantics and pragmatics. As everything in HPSG, the information characterizing a sign is represented in the format of feature structure descriptions. In the following, I describe the gist of the architecture of sign objects.

On the highest level of the representation of a *sign*, the supertype which subsumes both lexical and phrasal signs, we make a distinction between the features PHON and SYNSEM (often abbreviated to SS):

(277)
$$\begin{bmatrix} \textit{sign} & \\ \textsc{phon} & \textit{list(phon)} \\ \textsc{synsem} & \textit{synsem} \end{bmatrix}$$

This distinction is made in order to single out the information that is relevant for surface combination; thus, information contained in the value of SYNSEM can be selected for by other elements. The value of PHON corresponds to the phonological form of a sign; to keep things simple, HPSG analyses that do not focus on phonological phenomena instantiate PHON by the orthographic form of the de-

scribed sign. The value of SYNSEM has the type *synsem*, which comes with two attributes:[2]

(278)
$$\begin{bmatrix} \textit{synsem} \\ \text{LOC } \textit{loc} \\ \text{NONLOC } \textit{nonloc} \end{bmatrix}$$

LOC specifies locally relevant features, whereas NONLOC specifies features that are used in the analysis of nonlocal dependencies. In the following, I focus on the LOC attribute:

(279)
$$\begin{bmatrix} \textit{loc} \\ \text{CAT(EGORY) } \textit{category} \\ \text{CONT(ENT) } \textit{content} \end{bmatrix}$$

CAT specifies the relevant syntactic features; it accommodates four attributes – HEAD, SPR, COMPS and ARG-ST:

(280)
$$\begin{bmatrix} \textit{cat} \\ \text{HEAD } \textit{head} \\ \text{SPR } \textit{list(synsem)} \\ \text{COMPS } \textit{list(synsem)} \\ \text{ARG-ST } \textit{list(synsem)} \end{bmatrix}$$

The HEAD feature of a lexical sign specifies its part of speech as well as part-of-speech specific features, such as case for nouns and verb form for verbs. As will be seen in the following section, a general principle ensures that the 'head' information of a lexical sign is projected up to the saturated phrase level; thus, the values of the head features of the phrase are identical with those of the lexical

[2]The additional features LEX and C-CONT are often assumed as part of the SYNSEM information. C-CONT accommodates the semantic contribution of constructions. LEX is used to distinguish projections whose heads already have combined with at least one of their complements from those whose heads have not (cf. Müller, 2002a, p. 87, *i. a.*). These two features are not used in my analysis and thus will not be specified in the following descriptions.

head. The HEAD feature specifies information that is associated with the lexical head and is relevant for the behavior of its maximal projection.

The ARG-ST feature contains a list of *synsem* objects which represent the underlying argument structure of the sign. ARG-ST is only present on lexical signs.[3]

The two features SPR and COMPS are used to represent the overtly realized dependents of the sign: they accommodate SYNSEM descriptions that constrain the dependents which the sign must combine with in order to grow into a saturated phrase. Some descriptions of the framework (for instance, Pollard and Sag 1994, to the exclusion of Chapter 9), use one single SUBCAT list which contains all dependents that are selected by a head. However, as discussed in Borsley (1987, 1989, 1990), the special status of the subject in configurational languages calls for an additional feature which "singles out" the external argument. In the following, I use the SPR feature to accommodate subjects of verbs, determiners of nouns and some degree expressions combining with specifiers; the value of SPR is an empty list or a list with one element.[4] The COMPS list specifies the complements of the head; its elements are ordered by increasing obliqueness.

The value of the ARG-ST feature is closely related to the values of the valence features; in particular, ARG-ST contains the valents of a verb, whereas the valence features specify their surface realization. Different languages manifest different relationships between ARG-ST and valence (Manning and Sag, 1998); in the following, I assume that the value of ARG-ST corresponds to the concatenation of the valence lists:

[3]Some authors have proposed the projection of ARG-ST onto the mother node in order to make the complete information about the argument structure of a word accessible on its phrasal projections for certain types of constructions, cf. Meurers (1998) and Przepiorkowski (2001).

[4]Note that some analyses posit SPR lists with multiple elements, e. g. Müller and Oersnes (2013) for an analysis of object shift in Danish and Ng (1997) for an analysis of the Chinese NP.

(281)
$$\left[\begin{array}{l}\text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \left[\begin{array}{l}\text{SPR } \boxed{1} \\ \text{COMPS } \boxed{2} \\ \text{ARG-ST } \boxed{1} \oplus \boxed{2}\end{array}\right]\end{array}\right]$$

CONT(ENT), the second SYNSEM feature, has three main attributes – INDEX, KEY and RELATIONS:

(282)
$$\left[\begin{array}{l}\text{CONT} \left[\begin{array}{l}\text{INDEX } \textit{index} \\ \text{KEY } \textit{rel} \\ \text{RELS } \textit{list(rel)}\end{array}\right]\end{array}\right]$$

The INDEX provides an identifier that can be used for semantic role assignment and phenomena such as binding, relativization etc. In the following, we distinguish between the following subtypes of *index*:

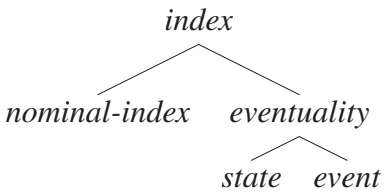


Figure 6.1: The *index* hierarchy

For nominal elements, the index is a referential variable that identifies the discourse referent of the expression. Predicative elements have an index of type *eventuality*, which, following Bach (1986), covers both events and states. *Event* indices accommodate events and states coming with a Davidsonian event argument, whereas *state* indices accommodate Kimian states (see Maienborn 2007 for a discussion of the semantics and of the distinctive properties of Davidsonian and Kimian states).

The KEY feature captures the main semantic contribution of a lexical head. The third attribute, RELS, is a list-valued attribute that specifies the semantic relations contributed by the sign; these relations specify semantic indices as their arguments. At the syntax-semantics interface, semantic indices can be associated

with the elements in the valence list of a head in order to ensure the right syntax-semantics mapping for arguments. This mechanism is called *linking* (cf. Davis and Koenig 2000; Koenig and Davis 2003, 2006; Davis 2001; Beavers 2005).

To summarize, the basic local architecture of a linguistic sign looks as follows:

(283)
$$\begin{bmatrix} \textit{word} \\ \text{PHON } \textit{list(phon)} \\ \text{SYNSEM} \mid \text{LOC} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{head} \\ \text{SPR } \textit{list(synsem)} \\ \text{COMPS } \textit{list(synsem)} \end{bmatrix} \\ \text{ARG-ST } \textit{list(synsem)} \\ \text{CONT} \begin{bmatrix} \text{INDEX } \textit{index} \\ \text{KEY } \textit{index} \\ \text{RELS } \textit{list(reln)} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

As an example, the following feature structure shows the relevant parts of the representation at the example of the verb *eats*:

(284)
$$\begin{bmatrix} \textit{word} \\ \text{PHON } \textit{<eats>} \\ \text{SYNSEM} \mid \text{LOC} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{VFORM } \textit{fin} \\ \text{AUX} - \end{bmatrix} \\ \text{SPR } \boxed{1} \\ \text{COMPS } \boxed{3} \end{bmatrix} \\ \text{ARG-ST } \boxed{1} \left\langle \text{NP}_{\boxed{2}}[\textit{3sg}] \right\rangle \oplus \boxed{3} \left\langle \text{NP}_{\boxed{4}} \right\rangle \\ \text{CONT} \begin{bmatrix} \text{INDEX } \boxed{5}\ \textit{event} \\ \text{RELS} \left\langle \begin{bmatrix} \textit{eat-reln} \\ \text{EVENT } \boxed{5} \\ \text{AGENT } \boxed{2} \\ \text{THEME } \boxed{4} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

eats is an object of type *word*. By convention, its phonological representation is simplified to its orthographic form. CAT and CONT specify syntactic-semantic information that is relevant for local combination of the sign. The HEAD feature specifies the part of speech as well as two part-of-speech specific features, namely the verb form and whether the verb is an auxiliary. SPR constrains the subject of the verb to a singular third-person nominal element, whereas COMPS contains the object. The two dependents are linked with the semantic arguments in the relations of CONT. The linking is indicated by subscript tags in the ARG-ST feature; the value of ARG-ST corresponds to the concatenation of the SPR and COMPS lists. In the CONT value, the index identifies the event. The relations list contains the semantic contributions of the verb, the arguments in the relation being coindexed with the semantic indices of the elements in the valence lists.

6.2 The linguistic approach

6.2.1 The lexicon

The lexicon has a dominant role in the framework; this goes in line with the evolution of the lexicon from a simple enumeration of linguistic exceptions (Bloomfield, 1933) to a by far more prominent role in later lexicalist approaches. The more systematic view of the lexicon was initiated by Chomsky (1970), who used lexical relationships to model structural similarities between the behavior of verbs and their nominalizations; the approach was made explicit in Jackendoff (1975) and further developed in Categorial Grammar (Dowty, 1978) and other lexicalist formalisms, such as LFG and HPSG.

In its original conception, the lexicon can be seen as an enumeration of lexical items; a general constraint on the type *word* has been stated as follows (Meurers, 1994, p. 25):

(285) *Word principle*:

$word \rightarrow lexical\ entry_1 \vee lexical\ entry_2 \vee \ldots \vee lexical\ entry_n$

Thus, an item is an object of type *word* if it satisfies some lexical entry in the lexicon. A lexicon with a completely flat structure, as conveyed by the word principle, is highly redundant. It does not capture the fact that lexical items can share properties; in most cases, only small bits of information are idiosyncratic to individual words. Thus, nouns share inflection paradigms, verbs share argument structure patterns, etc. The full specification of all features on each lexical entry would lead to a voluminous and unstructured collection of linguistic descriptions. From a theoretical and practical point of view, it is beneficial to maximally reduce redundancy; this parallels the observation from psycholinguistics that novel items are quickly located inside of our mental lexicons based on the contexts of their occurrence; thus, knowledge about systematic similarities between words is a part of our knowledge of language. In HPSG, the lexicon is organized by inheritance, lexical rules and relational constraints (Flickinger 1987; Davis 1996; Meurers 2001).

Inheritance

Inheritance is a mechanism commonly used for the organization of information about sets of objects. Objects are classified in a hierarchical collection of classes; each class is associated with a number of properties specified as constraints on the members of the class, these constraints being inherited by the subclasses of this class. The HPSG lexicon allows for multiple inheritance: a type may inherit information from more than one supertype.

Detailed treatments of the organization of the inheritance hierarchy in HPSG can be found in Davis (1996), Flickinger (1987) and Davis and Koenig (2000).

Lexical rules

In the previous paragraph, we have seen how inheritance is used to capture so-called vertical generalizations in the lexicon. Now, consider the following three sentences which illustrate resultative constructions from English, German and Chinese:

(286) a. We drank the pub dry.

b. Wir fischen den Teich leer.
we fish ART pond empty
'We are fishing the pond empty.'

c. 老王 哭-红 了 眼睛。
Lǎowáng kū-hóng le yǎnjīng.
Laowang cry-red.RES PFV eye
'Laowang cried until his eyes were red.'

The main verbs are used intransitively; however, they combine with an additional NP and an adjective. The adjective denotes a property that obtains of the additional NP as a result of the action described by the main verb. If we adopt a lexicalist approach and use inheritance to model the phenomenon, we would have to posit an additional lexical entry for each intransitive verb that potentially occurs in resultative contexts. There are two obvious problems with this approach: first, positing additional lexical entries for different valence frames on a verb-individual basis would lead to a very voluminous lexicon. More importantly, we would miss the generalization that many valence changes can apply to large classes of verbs, thus reducing the predictive power of the theory. Besides, Müller (2006) shows that the inheritance mechanism becomes still more inefficient once the structures interact with other phenomena, such as constituent order variation (Section 2) and derivational morphology (Section 5). Moreover, it fails when we wish to account

for cases where the lexical item undergoes more than one valence-changing process (Müller, 2013, p. 6–7; Müller and Wechsler, To Appear 2014, p. 47).

Lexical rules act as the lexical pendant to syntactic transformations, thus responding to Chomsky's Lexicalist Hypothesis (Chomsky, 1970) which states that syntactic transformations cannot operate on lexical items. Dowty (1978) proposes the use of "lexically governed transformations", which provide a non-syntactic tool to deal with systematic derivations and relations in the lexicon in a way which allows to "express the relations between lexical entries in accord with a native speaker's intuition" (Jackendoff, 1975). One classical application domain of lexical rules is morphology, specifically inflection and regular instances of derivational morphology. Another field of application are valence alternations such as voice or argument alternations: here, lexical rules license a lexical item whose subcategorization requirements and linking constraints differ from the input item.

The integration of lexical rules into the lexical component seems to clash with the otherwise enumerative character of the lexicon. Thus, the status of lexical rules has been subject to closer consideration. Jackendoff (1975) considers two alternative theories of lexical rules, depending on whether lexical rules are used as generative devices for the creation of new lexical items or, else, whether they are stated at a meta-level in order to distinguish between redundant and independent information in the lexicon. In HPSG, lexical rules are modelled as constraints on typed feature structures; they are integrated into the type hierarchy under the type *lexical-rule*, which takes an additional top-value feature LEX-DTR. The value of LEX-DTR is a *synsem* object which constrains the word or stem which is "input" to the lexical rule. Redundancy is eliminated by specifying only those parts of the output value that conflict with the information in the input entry; thus, information that is identical across the two entries is not mentioned again in the output.

The following figure shows a lexical rule that captures the properties of the resultatives in (286):[5]

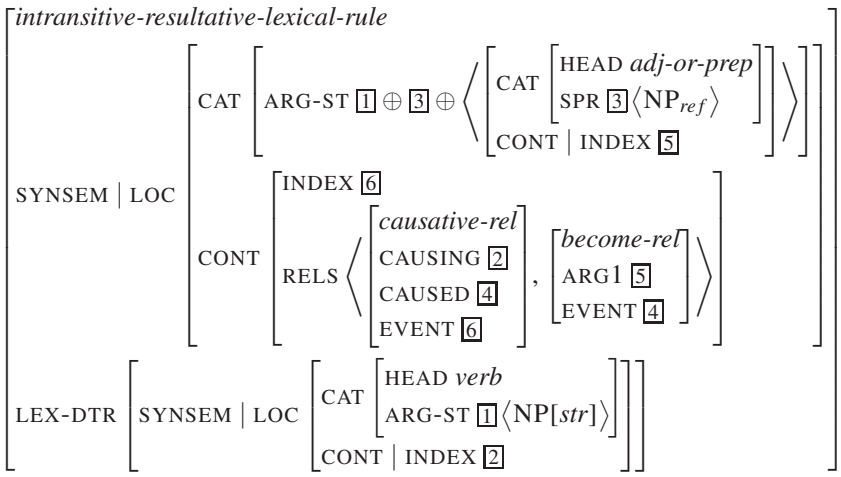
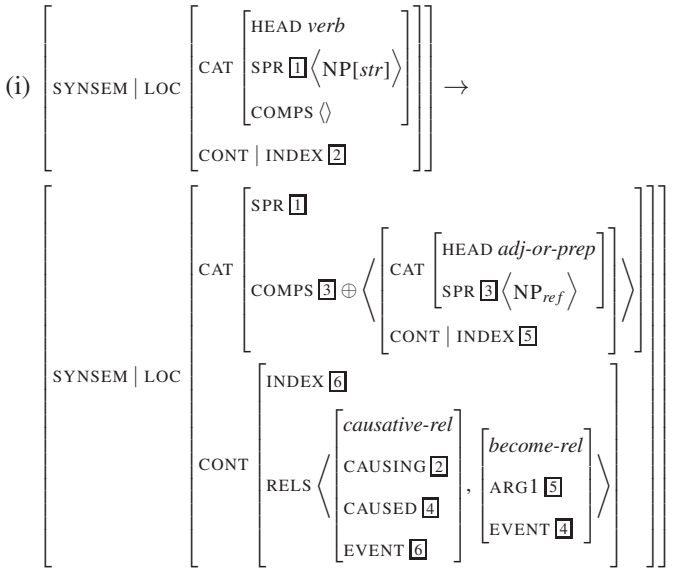


Figure 6.2: Lexical rule for resultative constructions (adapted from Müller, 2006, p. 241)

[5]To make the representation more suggestive, authors frequently use an alternative format of representation in which the input and the output are represented by two separate feature structure descriptions that are connected by an arrow:



(adapted from Müller, 2006, p. 241)

The LEX-DTR value constrains the SYNSEM value of an intransitive stem. The SYNSEM value of the licensed lexical item represents a related constraint with a different valence specification: additionally to the specifier, the verb selects for an adjectival or prepositional complement which is not saturated for its specifier. This specifier is attracted onto the COMPS list of the main verb, which realizes it syntactically. The CONT value carries the semantics of a complex causative situation that is composed by the event described by the main verb and the state described by the resultative complement.

Relational constraints as an alternative to lexical rules

As the name suggests, relational constraints constrain the possible relations between values of different features. As an example, the following shows constraints that have been proposed by Kathol (1994) in order to capture the inflectional paradigm of German adjectives:

(287) $adjective \rightarrow \begin{bmatrix} \text{PHON } \boxed{3} \\ \text{STEM } \boxed{1} \\ \text{INFL } \boxed{2} \end{bmatrix} \wedge r(\boxed{1}, \boxed{2}, \boxed{3})$

The three-place relation *r* defines possible configurations of the PHON, STEM and INFL values; its definition reflects the inflectional paradigm of adjectives in HPSG format:

(288) a. $r(\boxed{1}, \begin{bmatrix} \text{NUM} & sg \\ \text{CASE} & gen \vee acc \\ \text{DECL} & weak \end{bmatrix}, \boxed{1} \oplus \langle en \rangle)$

b. $r(\boxed{1}, \begin{bmatrix} \text{NUM} & sg \\ \text{CASE} & nom \vee acc \\ \text{GEN} & fem \end{bmatrix}, \boxed{1} \oplus \langle e \rangle)$

c. ...

In the domain of valence alternations and dependent realization, constraints have been formulated on possible relations between the lists of different valence levels. Thus, Manning (1995), Manning and Sag (1998) and Koenig (1999) express different valence and linking patterns via different relations between the SUBCAT and the ARG-ST lists. Bouma et al. (2001) use relational constraints in order to account for local and non-local dependent realization. They add the valence level DEPS, which accommodates all syntactic complements and adjuncts of a head and allows them to be distributed between the local and nonlocal realization features in a rather free way.

Compared to lexical rules, relational constraints have two shortcomings which are discussed in Müller (2008, 2010, 2013) and Müller and Wechsler (2012): first, each type of phenomenon requires a new feature in order to model the relevant distinctions. For example, valence changes are expressed against the feature ARG-ST, while local vs. nonlocal realization of dependents is modelled against the additional DEPS level; thus, the use of relational constraints leads to auxiliary feature stipulations without intrinsic motivation. Second, in the case of valence changes, the approach does not provide the flexibility that is required in order to capture multiple valence changing processes on the same source item (Müller 2008, p. 107–113, Müller 2013). Thus, on the one hand, some languages allow iterative valence changes: Turkish, Lithuanian and Irish allow for passivization and impersonalization on the same instance of a lexical item; Turkish also allows for multiple application of causativization. On the other hand, we often have combinations of different valence changes on the same item; relational constraints are too quick in imposing a structure that potentially blocks the application of further constraints on the lexical item.

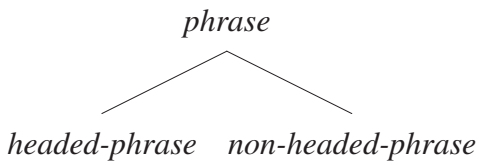
6.2.2 The grammar

This section describes how the theory combines lexical items into phrases. The theory consists of three basic components:

- *Grammar principles*: constraints that hold of all well-formed linguistic objects; these principles may be universal or language-specific.
- *Immediate dominance (ID) schemata*: descriptions of possible constituent structures
- *Linear precedence (LP) rules*: constraints which rule out impossible constituent orders

Before considering these rules and principles in more detail, we make a distinction between the two immediate subtypes of the type *phrase*:

(289)

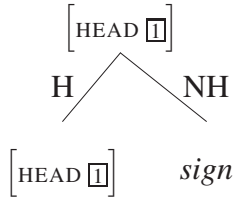


Below, I present the principles and constraints on constituent structure that determine the well-formedness of headed phrases.

Grammar principles

The three principles that constrain headed phrases are the Head Feature Principle, the Valence Principle and the Semantics Principle; these principles are hypothetically universal. The Head Feature Principle ensures that a subset of the properties of the lexical head is projected up to phrase level:

(290) a. **Head feature principle** (Pollard and Sag, 1994, p. 34): the HEAD value of any headed phrase is structure-shared with the HEAD value of the head daughter.

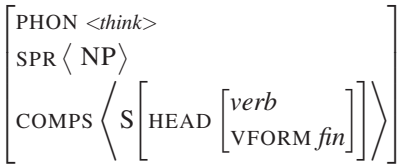
b. *headed-phrase* → 

Thus, the head feature contains information that is projected from the lexical head to the phrase and can be selected by other signs. Consider the following example:

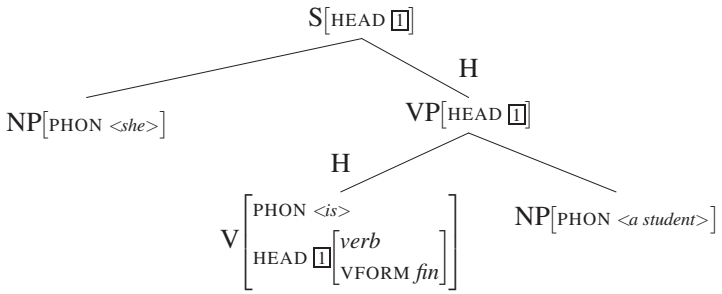
(291) a. John thinks she is a student.

b. * John thinks her to be a student.

The verb *think* selects for a subject NP and a finite clause:[6]



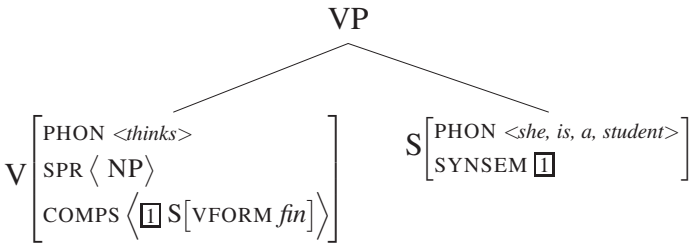
The finite clause is a saturated projection of a finite verbal head:



The information necessary for *think* in (291a) to correctly constrain its complement is projected from the verbal head *is* onto the mother node of the clause;

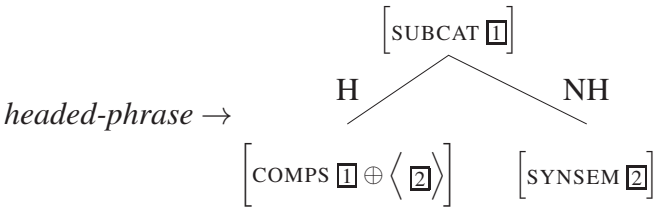
[6] A technical remark is in order here about the AVM representation: in order to break down the representations, I will often omit the complete feature paths in the following descriptions; this does not compromise precision, since each feature can still be unequivocally attributed to a type.

from there, it can be selected by the higher head:



The second principle for headed phrases – the Valence principle (or Subcategorization principle) – constrains syntactic combination:

(292) **Valence principle** (adapted from Pollard and Sag 1994, p. 34)[7]: in a headed phrase, the COMPS value of the head daughter is the concatenation of the phrase's COMPS list with the list (in order of increasing obliqueness) of SYNSEM values of the complement daughters.



Thus, once the head combines with one of its required dependents, this dependent is subtracted from the SUBCAT list of the lower node and hence does not appear at the higher nodes. Figure 6.3 illustrates how the subcategorization principle operates on sentence (291a).

[7]The universal applicability of the concepts of valence and argument structure for the explanation of syntactic combination has recently been questioned in Koenig and Michelson (2012) and Koenig and Michelson (In press), two studies of argument realization in the Iroquoian language Oneida. In Oneida, all NPs that are semantically selected by the verb are syntactically optional. If they are realized, they combine with the verb as "adjunctive" dependents and are analyzed as part of unbounded dependencies, thus making the valence lists superfluous.

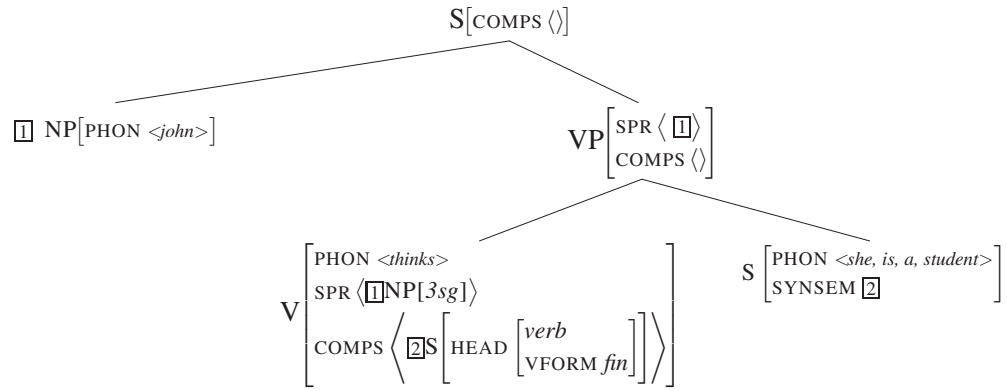
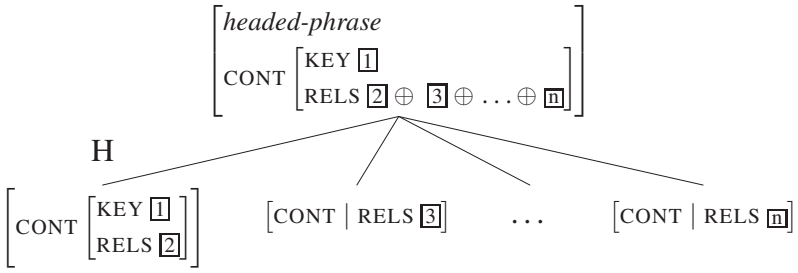


Figure 6.3: Subcategorization in *John thinks she is a student.*

The third universal principle is the Semantics Principle, which models semantic compositionality: the meaning of an utterance is composed from the meanings of its parts and the semantics of the rules which are used for their combination. To achieve this, three semantic representations – Situation Semantics (Barwise and Perry, 1983), Minimal Recursion Semantics (MRS, Copestake et al. 2005) and Lexical Resource Semantics (LRS, Penn and Richter 2004) – have been used in HPSG. In the following, I will adopt a flat representation of semantic composition as proposed in MRS: the relations list of the mother corresponds to the concatenation of the relations of its daughters. Predicative and referential relations come with an index argument (EVENT or STATE for predicative relations, INST(ANCE) for nominal relations); state or event indices can be used as arguments in order to build semantic representations of composite events with more than one subevent.[8] The KEY value of the lexical daughter, which corresponds to the main semantic relation introduced by the lexical item, is projected onto the mother node. Thus, the overall semantics looks as follows:

[8] I adopt this simplification in the sense of a Davidsonian semantics for the sake of readability. In the full-fledged MRS representation, each relation contains a HANDLE argument which can be selected by other relations.



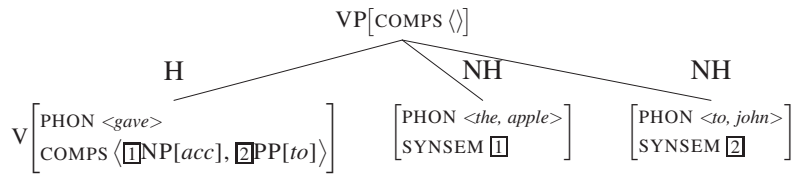
Constituent structure

Possible constituent structures are constrained by immediate dominance schemata. The following analysis makes use of *head-complement*, *specifier-head* and *head-marker* structures. The multiple-branching *head-complement* structure is constrained as follows:

$$\textit{head-complement-phrase} \rightarrow \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS} \langle\rangle \\ \text{HEAD-DTR} \mid \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{COMPS} \langle \boxed{1}, \ldots \boxed{n} \rangle \\ \text{NON-HEAD-DTRS} \left\langle [\text{SYNSEM } \boxed{1}], \ldots [\text{SYNSEM } \boxed{n}] \right\rangle \end{bmatrix}$$

Figure 6.4: *Head-complement* schema (adapted from Pollard and Sag, 1994, p. 40)

The phrase has a head daughter and a list of non-head daughters. The COMPS list of the head daughter consists of the values of the dependents that are realized by the sisters. To illustrate, the following shows the representation for the head-complement structure *gave the apple to John*:

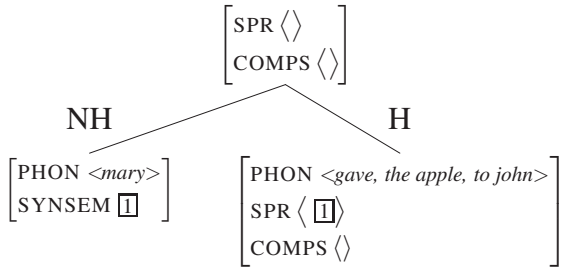


The *specifier-head* schema is as follows:

$$\textit{specifier-head-phrase} \rightarrow \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \mid \text{SPR} \langle\rangle \\ \text{HEAD-DTR} \mid \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{SPR} \langle \boxed{1} \rangle \\ \text{COMPS} \langle\rangle \end{bmatrix} \\ \text{NON-HEAD-DTRS} \left\langle \begin{bmatrix} \text{SYNSEM} \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix}$$

Figure 6.5: *Specifier-head* schema

The head daughter has one element on its SPR list. This element corresponds to the SYNSEM value of the non-head daughter. The resulting phrase has an empty SPR list. The following shows how the *specifier-head* schema licenses the combination of the VP *gave the apple to John* with a subject:



The last schema which is relevant for our analysis is the *head-marker* schema (Pollard and Sag 1994, p. 45–46).[9] Some additional machinery is required in order to explain the head-marker schema. On the one hand, markers are of the category *marker*; the head feature of a marker bears the additional feature SPEC(IFIED). This feature accommodates the SYNSEM value of the head which is being marked. Further, we assume a CAT attribute MARKING. The value of this attribute is *unmarked* for all lexical categories other than *marker*. *Marker*s bear a non-default value which is inherited onto the phrase. The *head-marker* schema is as follows:

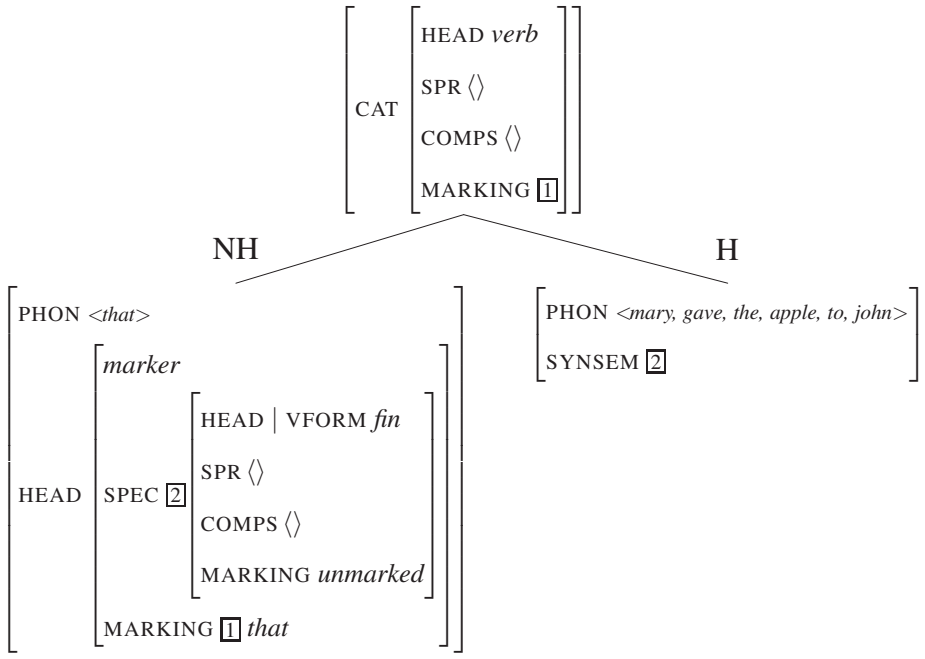
[9]This schema will be used for the analysis of *de*-complements which often cooccur with the *bă*-construction, as presented in Section 1.2.

(293) *head-marker-structure* →

$$\begin{bmatrix} \text{SS} \mid \text{LOC} \mid \text{CAT} \mid \text{MARKING } \boxed{1} \\ \text{HEAD-DTR} \mid \text{SS } \boxed{2} \\ \text{NH-DTR} \mid \text{SS} \mid \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix} \textit{marker} \\ \text{SPEC } \boxed{2} \end{bmatrix} \\ \text{SPR } \langle\rangle \\ \text{COMPS } \langle\rangle \\ \text{MARKING } \boxed{1}\ \textit{marked} \end{bmatrix} \end{bmatrix}$$

If we follow Pollard and Sag and assume a marker analysis for complementizers, the clause *that Mary gave the apple to John* is licensed as follows:

(294)



6.2.3 Complex predicates and argument composition

In this section, I consider the mechanism of argument composition (also: argument attraction) which has been used to model raising and control phenomena and will be adopted for the representation of the *bă*-construction as well as of co-occurring resultative complements in the following analysis.

In HPSG, raising and control are analyzed via second-order dependencies between a selector and its selected elements; the formalism allows words to access and to realize the unrealized valents of their dependents (see Pollard and Sag 1994, Chapter 3 for a basic analysis). Valence tags that range over part of or over an entire valence list of the selected complement are partially structure-shared with the valence of the selector:

(295) $\left[\text{COMPS } \boxed{1} \oplus \left\langle \text{V}\left[\text{COMPS } \textit{list} \oplus \boxed{1} \oplus \textit{list}\right]\right\rangle\right]$

The valence of a linguistic object that satisfies this constraint is composed of two parts: on the one hand, it independently selects a verbal complement. On the other hand, it also selects a list of complements whose *synsem* values are structure-shared with a (sub-)list of the *synsem*s selected by the selected verbal complement. As an example, consider the following sentence:

(296) We believe John to be the best candidate.

The description of *believe* is as follows:

$$\left[\begin{array}{l}\text{PHON } \langle \textit{believe} \rangle \\ \text{LOC}\left[\begin{array}{ll}\text{CAT} & \left[\begin{array}{l}\text{SPR}\left\langle \text{NP}_{\boxed{1}}\right\rangle \\ \text{COMPS}\left\langle \boxed{2}, \text{VP}\left[\begin{array}{l}\text{VFORM } \textit{inf} \\ \text{SPR}\left\langle \boxed{2}\right\rangle \\ \text{CONT} \mid \text{INDEX } \boxed{3}\end{array}\right]\right\rangle\end{array}\right] \\ \text{CONT} & \left[\begin{array}{l}\textit{believe} \\ \text{EXPERIENCER } \boxed{1} \\ \text{STATE-OF-AFFAIRS } \boxed{3}\end{array}\right]\end{array}\right]\end{array}\right]$$

The verb selects for a specifier NP and a VP with an unsaturated specifier ($\boxed{2}$). This specifier is raised to the COMPS feature of *believe*, from where it can be realized as its object.

A major field of application of the argument composition approach is the Germanic verb cluster which has been treated by Hinrichs and Nakazawa (1989, 1994,

1998), Kiss (1995), Müller (1996, 2000, 2002b, 2005b, 2008), Bouma and van Noord (1998) and Meurers (1999), *i. a.*: in constructions with tense auxiliaries, the complete valence requirements of the lexical verb are attracted onto the head auxiliary. Consider the following sentence, in which the future auxiliary *wird* combines with a cluster consisting of two non-finite verbs:

(297) dass er dem Mann *geholfen haben wird*
that he.NOM ART.DAT man help.PART have.INF FUT.3.SG
'that he will have helped the man'

Figure 6.6 shows the analysis proposed for this example in Müller (2005a). The combination happens via the *head-cluster-structure* (Müller, 2005a, p. 18), which ensures that non-finite verb forms combine with each other prior to combining with the finite auxiliary and with their nominal arguments. Thus, the "cluster" of nonfinite verbs combines with the auxiliary. The SUBCAT list of the main lexical verb is attracted by the head auxiliary, which ensures its projection onto the mother node. In (297), the two nominal arguments of *geholfen* are passed to *haben* and from there to the selecting *wird*. Finally, the cluster *geholfen haben wird* realizes the nominal arguments.

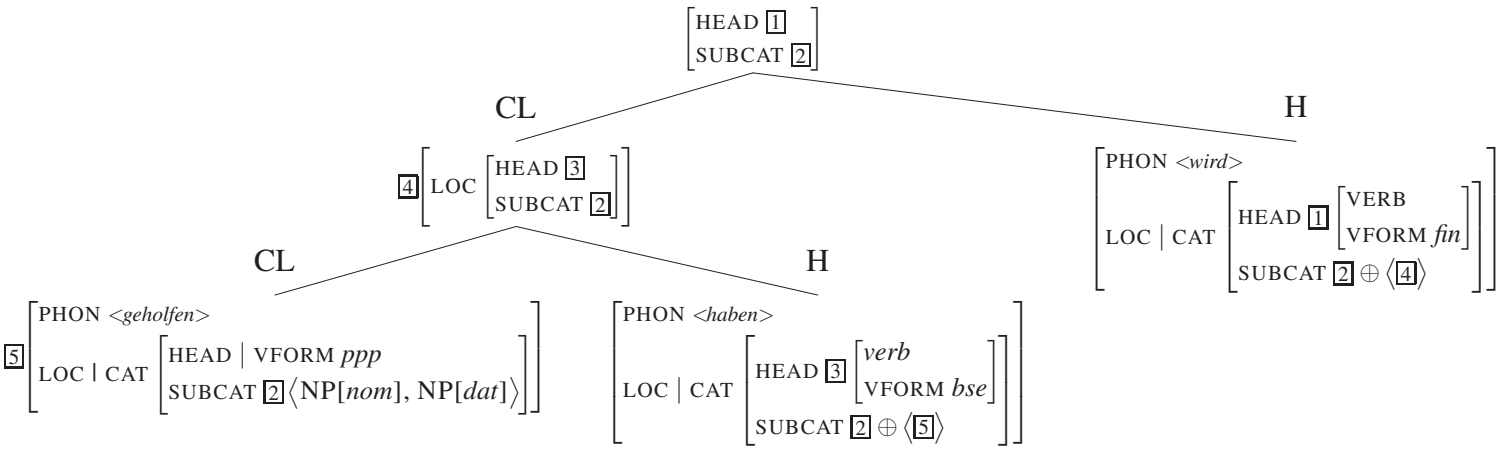


Figure 6.6: Analysis for the verbal complex *(dass er dem Mann) geholfen haben wird* (Müller, 2005a, p. 21)[a]

[a]Müller (2005a) uses a single valence list, SUBCAT, instead of the two lists SPR and COMPS which are assumed in the present exposition. As explained in Müller and Oersnes (2013, p. 7–8), a single valence list is more appropriate for the analysis of non-configurational languages with free constituent order, since these languages allow for a treatment of the subject on a par with other arguments.

6.3 Summary

In this chapter, I have presented the structure of descriptions of linguistic objects and important theory-internal constraints and principles that form the foundation of the HPSG framework. In the next chapter, I will lay out the ground for the analysis of the Chinese *bǎ*-construction: it will be shown how the notions of scalar semantics introduced in Chapter 4 and applied to the *bǎ*-construction in Chapter 5 can be formalized in HPGS. Further, I present analyses for complement structures that commonly appear with the verb in *bǎ*-constructions.

Chapter 7

Prerequisites for the analysis

In this chapter, I present the required prerequisites for the following analysis of the *bǎ*-construction in HPSG. First, we will see how the notions of scalar semantics introduced in Section 4.2.2 and applied to the *bǎ*-construction in Chapter 5 can be formalized in the HPSG framework and integrated into semantic representations in the lexicon. Then, I sketch analyses for the types of complements that frequently combine with the verb in the *bǎ*-construction (cf. Section 1.2); broadly speaking, I analyze these complements by extending the valence of the verb with an additional dependent which contributes the scalar relations required by *bǎ*. Special attention will be paid to the resultative construction: just as the *bǎ*-construction, Chinese resultatives are flexible in their argument structure and may manifest ambiguous argument distributions; further, the fact that the *bǎ*-construction frequently co-occurs with resultatives has led many authors to mixing up the constraints and semantic functions of the two structures. In the following, I try to avoid this problem by first formalizing an analysis of resultatives on independent grounds.

7.1 Scalar semantics

7.1.1 Integration of scales into the theory

In Section 4.2.2, we have seen that authors have enriched the ontology of semantic types with a new type – *d* for degree – in order to model scales and degrees. This type has been assumed in most model-theoretic work on scalar semantics since Seuren (1973) and Cresswell (1976), as it is required for the construction of a comprehensive model of the semantics of gradable expressions and of selectional restrictions between degree expressions and their arguments. In HPSG, the degree type has been used in semantic representations by McNally and Kennedy (2002), Kennedy and McNally (2005a) and Abeillé and Godard (2003). The semantic analysis proposed here is based on two relation types which formalize the combination of scalar predicates with degrees into properties of individuals.

Formalization of scale-related relations

In order to get an explicit representation of the scalar notions, I introduce *scale relations* which label gradable properties and thus provide the scales, and *degree relations* which denote the degree to which the property obtains and thus return properties of individuals. The scale relation takes an argument which refers to the individual or the event of which the gradable property holds. The degree relation takes a scale relation as argument:

(298)

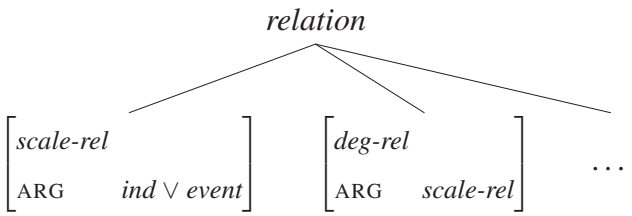


Figure 7.1 shows a fragment of the hierarchy of scale types. *Spatial-extent-relations* accommodate the spatial dimensions of an individual. Thus, for exam-

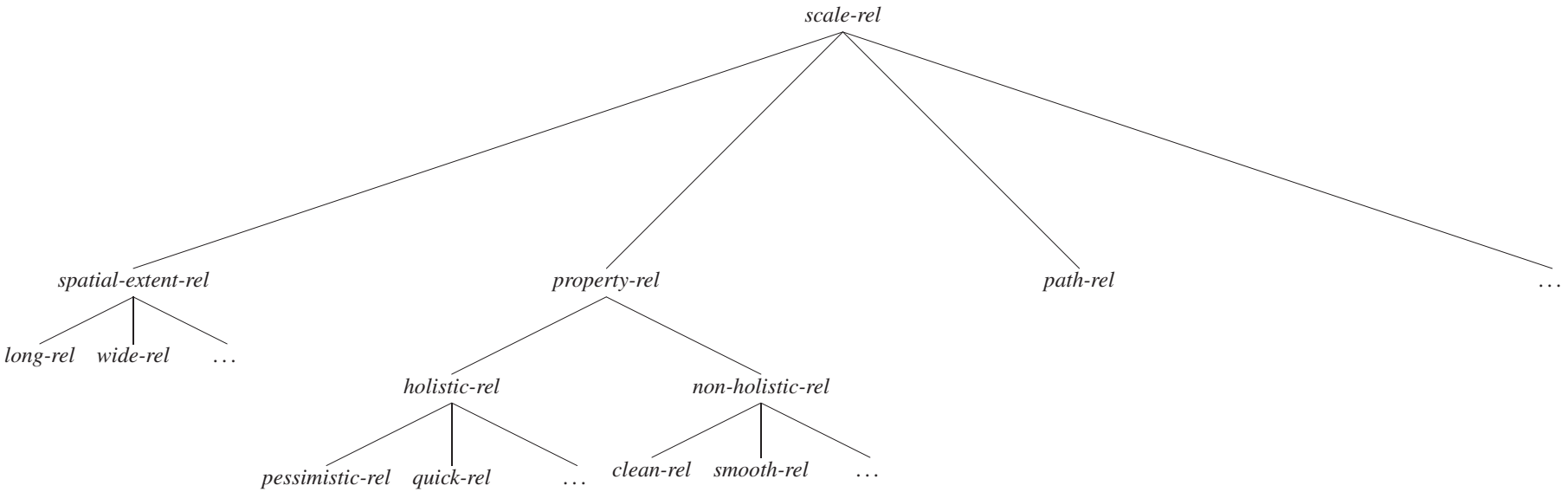


Figure 7.1: Partial hierarchy for *scale-relations*

ple, they have the subtypes *long* and *wide*. They also come into play in the case of verbs of consumption and creation, which denote the gradual change in size of an object. *Property-relations* describe characteristic properties of individuals. They are further subdivided into *holistic* and *non-holistic* properties: non-holistic properties, such as *clean*, may be true of one part of the object and false of another. By contrast, holistic properties, such as *pessimistic*, characterize the individual as a whole: under the standard physical view of the part-whole relation, it is hard to imagine an individual which can be divided into pessimistic and non-pessimistic parts. Finally, *path-relations* specify the trajectories of motion.

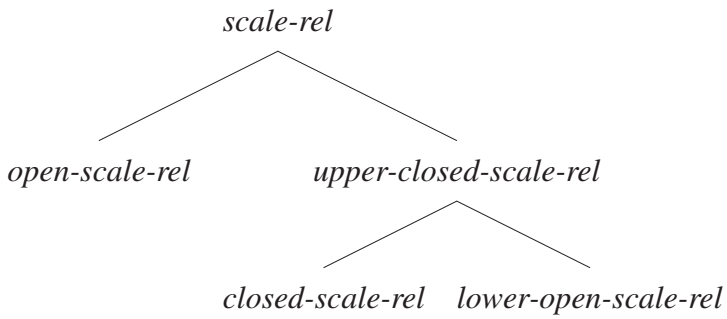
Degree modifiers may constrain the type of the scale they combine with. One important selectional restriction is the existence of endpoints; for example, the following APs show degree modifiers that combine only with closed scales:

(299) a. half/completely/almost empty

b. * half/completely/almost long

In order to model the relevant distinctions, I propose the following subtypes for the relation type *scale-rel*, which represent the variety of scales with respect to the existence of endpoints (cf. Section 5.1):

(300)



The left-hand branch is used for scales that are open at both ends. The right-hand branch is used for scales that are closed at the upper end; it is further subdivided for scales that are closed vs. open at the lower end.

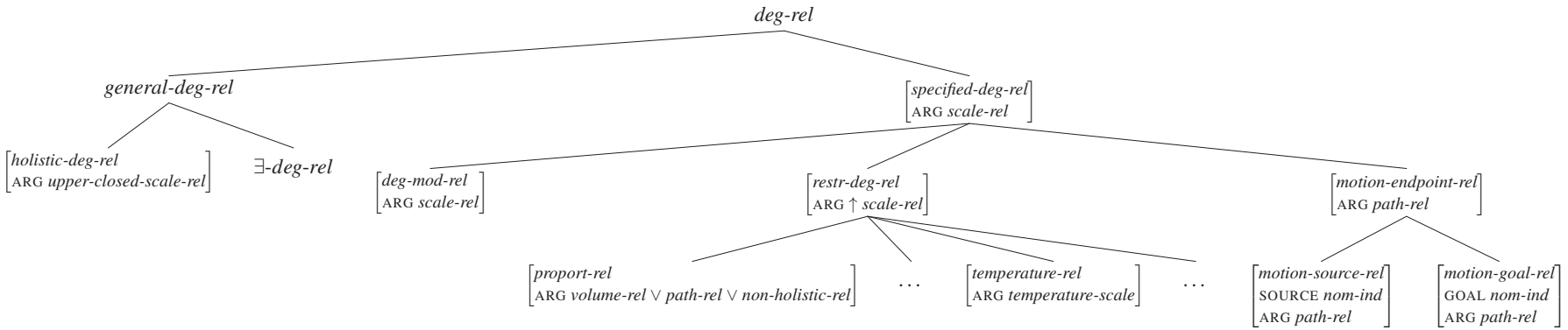


Figure 7.2: Partial hierarchy of degree types

The classification of *degree-relations* is mainly based on the type of the selected scale; a tentative classification of degree relations is shown in Figure 7.2. The left branch contains "general" degree relations, which are only sensitive to the formal properties of the scale, specifically to its open/closed property. Holistic relations imply the total traversal of the scale and, thus, require a scale which is closed at the upper end:

(301) a. The table is completely clean.

b. $\left[\text{RELS}\left\langle\left[\begin{array}{l}\textit{table-rel}\\ \text{INST}\ \boxed{1}\end{array}\right], \boxed{2}\left[\begin{array}{l}\textit{clean-rel}\\ \text{ARG}\ \boxed{1}\end{array}\right], \left[\begin{array}{l}\textit{holistic-deg-rel}\\ \text{ARG}\ \boxed{2}\end{array}\right]\right\rangle\right]$

$\exists$-*deg-rel* applies for existentially bound degrees that are underspecified with respect to their value:

(302) a. John ate at the apple.

b. $\left[\text{RELS}\left\langle\boxed{1}\left[\begin{array}{l}\textit{volume-rel}\\ \text{ARG APPLE}\end{array}\right], \left[\begin{array}{ll}\exists\textit{-deg-rel}\\ \text{ARG} & \boxed{1}\end{array}\right], \ldots\right\rangle\right]$

The event of eating at the apple comes about with a shrinking event on the side of the apple; since the conative alternation is used in (302a), the sentence does not entail a particular degree of shrinking.

The branch *specified-deg-rel* in Figure 7.2 contains degree relations which further constrain their scale argument: on the one hand, we have *deg(ree)-mod(idifer)-rel*, which is the supertype for relations contributed by degree modifiers such as *very, extremely, a bit, slightly* etc. On the other hand, we have *restr(ictive)-deg(ree)-rel(ations)*, which inherently restrict the types of their possible arguments. Proportional relations (*proport-rel*), such as *half of*, *a big part of* etc., refer to spatial portions of a scale and thus apply to spatial scales (303a), paths (303b) or scales denoting non-holistic properties, i. e. properties that can hold of some parts of the individual but not of others (303c); they do not apply to holistic property scales (303d):

(303) a. John ate half of the apple.

b. John walked half of the path.

c. John cleaned half of the table.

d. * John warmed the soup a half.

Besides, some degree expressions – especially measure phrases – tightly restrict their scale argument. Thus, *5 °Celsius* takes a temperature scale as argument, whereas *5 meters* is only compatible with extent and path scales.

Finally, we have the branch *motion-endpoint-relation*, which is used for the specification of the source and the goal of a motion event. Additionally to the scale argument, which, in this case, is a *path-rel*, relations of this type take an argument that corresponds to the source or the goal of the motion.

7.2 Integration of scalar relations into the lexicon

After having established the classifications of scalar and degree relations, we consider which lexical items or constructions should actually have such relations in their semantic representation. It has been noted that each entity can be conceptualized as a set of – binary or multi-valued – scalar properties (cf. Section 5.1). Obviously, we do not want to have all these scales to be present in the lexical entry of the item denoting the entity: this would get us to very voluminous lexical representations with a lot of information that would be irrelevant in most contexts. Instead, we encode scales in the predicates that apply to entities. Under this approach, a given predicate "picks out" some property of an entity which is relevant in the context of the utterance; the argument in the scale relation is coindexed with the participant to which it applies. Consider the following example:

(304) John is very tall.

The relations list is as follows:

(305)
$$\begin{bmatrix} \text{PHON } \langle \textit{John, is, very, tall} \rangle \\ \text{RELS } \left\langle \begin{bmatrix} \textit{name-rel} \\ \text{ARG } \boxed{1} \\ \text{NAME } \textit{john} \end{bmatrix}, \boxed{2}\begin{bmatrix} \textit{tall-rel} \\ \text{ARG } \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{very-rel} \\ \text{ARG } \boxed{2} \end{bmatrix} \right\rangle \end{bmatrix}$$

Similarly, the semantic representation of predicates denoting scalar change includes the scale along which the change takes place; the following shows a partial description of the verb *eat*:

(306)
$$\begin{bmatrix} \text{PHON } \langle \textit{eat} \rangle \\ \text{ARG-ST } \left\langle \text{NP}_{\boxed{1}}, \text{NP}_{\boxed{2}} \right\rangle \\ \text{CONT } \begin{bmatrix} \text{RELS } \left\langle \begin{bmatrix} \textit{eat-rel} \\ \text{ACTOR } \boxed{1} \\ \text{UNDERGOER } \boxed{2} \end{bmatrix}, \boxed{3}\begin{bmatrix} \textit{volume-rel} \\ \text{ARG } \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{deg-rel} \\ \text{ARG } \boxed{3} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix}$$

The verb selects for two NPs which correspond to the actor and the undergoer of the action. The undergoer changes along the scale of spatial extent:

(307) John ate the apple.

$$\begin{bmatrix} \text{PHON } \langle \textit{John, ate, the, apple} \rangle \\ \text{CONT} \mid \text{RELS } \left\langle \begin{bmatrix} \textit{name-rel} \\ \text{ARG } \boxed{1} \\ \text{NAME } \textit{john} \end{bmatrix}, \begin{bmatrix} \textit{apple-rel} \\ \text{ARG } \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{eat-rel} \\ \text{AGENT } \boxed{1} \\ \text{UNDERGOER } \boxed{2} \end{bmatrix}, \boxed{3}\begin{bmatrix} \textit{volume-rel} \\ \text{ARG } \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{holistic-deg-rel} \\ \text{ARG } \boxed{3} \end{bmatrix} \right\rangle \end{bmatrix}$$

Once a consumption verb in the perfective aspect is combined with a bound object, the sentence entails that the object is totally affected and, thus, consumed (cf. Krifka 1987, 1998, *i. a.*, on the relation between nominal boundedness and telicity). In our case, this means that the degree relation on *eat* changes to a holistic degree and, thus, signifies consumption of the whole apple.

Predicates containing scales inherit from the type *scalar-predicate*; this type has two immediate subtypes, *non-change-scalar-predicate* and *scalar-change-predicate*:

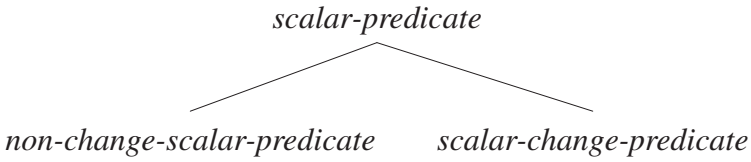


Figure 7.3: Types of scalar predicates

The left-hand type, *non-change-scalar-predicate*, is inherited by expressions denoting scalar properties of individuals, whereas the right-hand type *scalar-change-predicate* applies to predicates that denote changes in scalar properties. The three types in Figure 7.3 are constrained as follows:

(308) a. $\textit{scalar-predicate} \rightarrow \left[\text{CONT} \mid \text{RELS} \langle \textit{scale-rel} \rangle \oplus \textit{list}\right]$

b. $\textit{non-change-scalar-predicate} \rightarrow \left[\text{CONT} \left[\begin{array}{l}\text{IND } \boxed{1}\ (\textit{nom-ind} \vee \textit{event}) \\ \text{RELS} \left\langle \left[\begin{array}{l}\textit{scale-rel} \\ \text{ARG } \boxed{1}\end{array}\right] \right\rangle \oplus \textit{list}\end{array}\right]\right]$

c. $\textit{scalar-change-predicate} \rightarrow \left[\text{CONT} \left[\begin{array}{l}\text{IND } \boxed{1}\ \textit{event-ind} \\ \text{RELS} \left\langle \left[\begin{array}{l}\text{UNDERGOER } \boxed{2} \\ \text{EVENT } \boxed{1}\end{array}\right], \left[\begin{array}{l}\textit{scale-rel} \\ \text{ARG } \boxed{2}\end{array}\right] \right\rangle \oplus \textit{list}\end{array}\right]\right]$

Predicates of scalar change (308c) are particularly relevant for the *bǎ*-construction. Figure 7.4 shows a tentative classification of scalar change predicates which is mainly based on different scales to which the change applies. In many ways, the hierarchy parallels the descriptive classification of verbs that are acceptable in the *bǎ*-construction in bare form that has been presented in Section 5.1.

7.3 The analysis of postverbal dependents and their scalar semantics

In this section, I sketch HPSG analyses of *de*-complements, goal PPs, directional complements and resultative compounds. As we have seen in Section 1.2, these

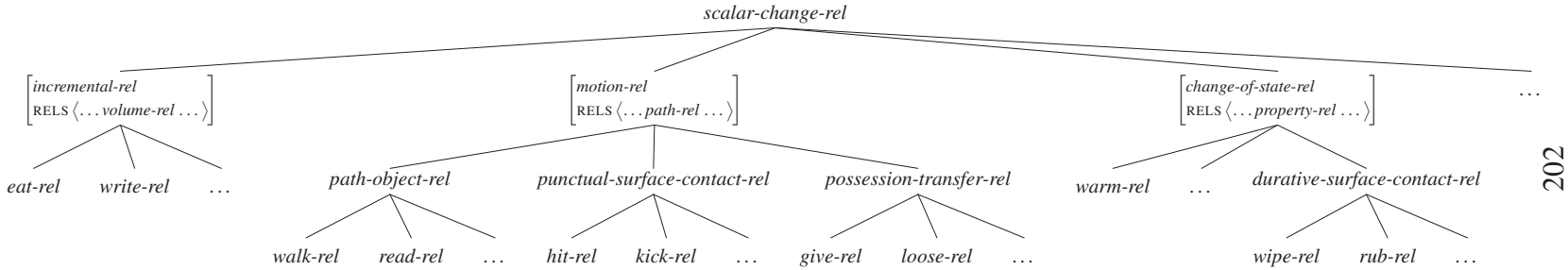


Figure 7.4: Classification of scalar change predicates

elements often combine with the lexical verb in the *bǎ*-construction and, besides, may be required to satisfy the semantic constraint of *bǎ* (see the AVD hypothesis in (266) on page 158). In order to model the combination of verbs with these additional dependents, we extend the COMPS feature in the "basic" lexical entries of verbs by the relevant complements. Semantic composition ensures that the scalar relations introduced by the complements are visible on the resulting structure and thus license their use in the *bǎ*-construction.

7.3.1 *De*-complements

The following example illustrates a *bǎ*-sentence in which the verb is licensed by virtue of the presence of an additional *de*-complement:

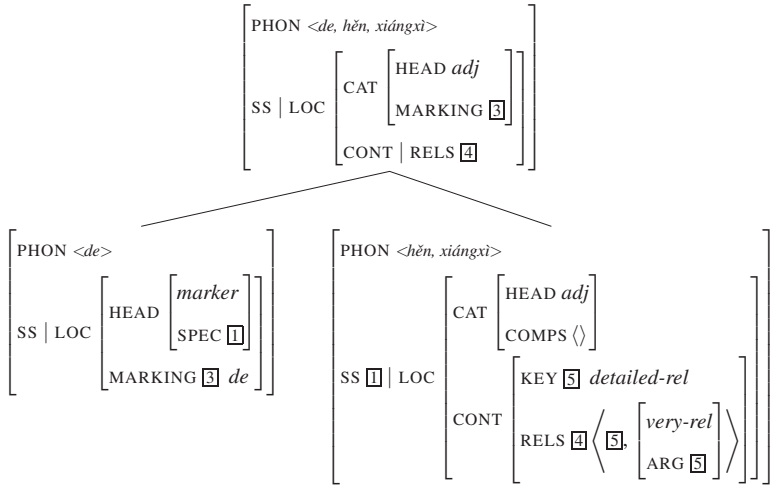
(309) 张三　　把 狗 看　*(得　很　详细).
Zhāngsān bǎ gǒu kàn *(de hěn xiángxì).
Zhangsan BA dog look DEG very detailed
'Zhangsan had a very detailed look at the dog.'

I analyze the combination of *de* with the AP in terms of the *head-marker-structure*, as defined in (293) on page 187. The lexical entry of *de* is as follows:

(310)
$$\left[\begin{array}{l}\text{PHON } \langle de \rangle \\ \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \left[\begin{array}{l}\text{HEAD } \left[\begin{array}{l}marker \\ \text{SPEC } \left[\begin{array}{l}\text{HEAD } adj \\ \text{SPR } \langle\rangle \\ \text{COMPS } \langle\rangle \\ \text{KEY } scale\text{-}rel\end{array}\right]\end{array}\right] \\ \text{MARKING } de\end{array}\right]\end{array}\right]$$

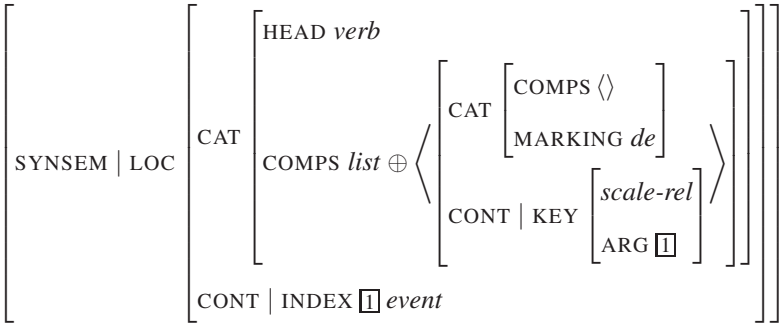
The syntactic category is *marker*; *de* specifies an adjectival element which contributes a scalar relation. The combination of *de* with the adjectival head works as follows:

(311)



A verb that combines with a *de*-complement has a COMPS list that has a *de*-marked element as its last element; only eventive verbs can combine with *de*-complements, which is ensured by the restriction on the type of the index of the verb:

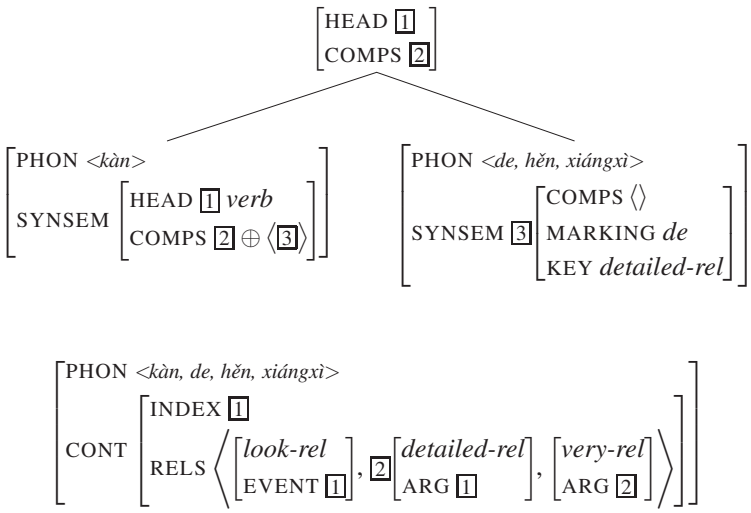
(312)



The semantic modification relation between the *de*-marked AP and the selecting verb is captured by the coindexing between the argument inside the AP's *scale-rel* and the index of the event denoted by the main verb.

The following tree shows the syntactic combination for 看得很详细 *kàn de hěn xiángxì* ('look closely'), as used in the *bǎ*-construction in (309):

The semantic contribution of the resulting structure is as follows:



7.3.2 Goal complements

Postverbal prepositional complements denoting the goal of a motion event license the use of motion verbs in the *bǎ*-construction:

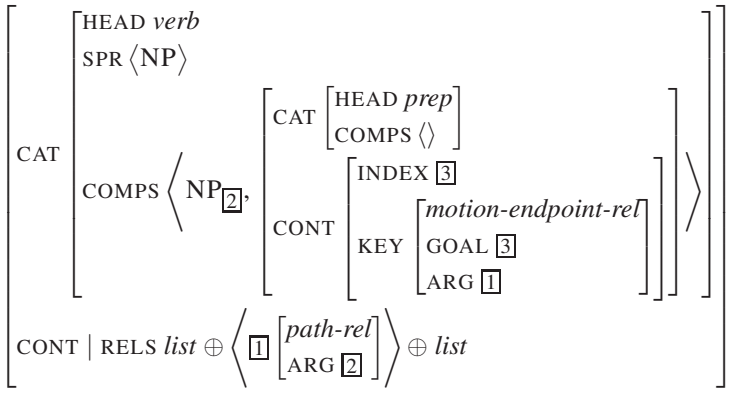
(313) 他 把 车 开 *(到 火车站)。
Tā bǎ chē kāi *(dào huǒchēzhàn).
he BA car drive to train station
'He drove the car to the train station.'

I assume that the KEY value of a directional preposition is of type *motion-endpoint-rel*. The lexical representation of a transitive verb that combines with a goal PP, such as 开 *kāi* ('drive') in (313), is as follows:

The combination for 开往火车站 *kāi wǎng huǒchēzhàn* ('drive towards the train station') is shown in Figure 7.5.

7.3.3 Directional complements

In Section 1.2, we have seen that directional complements consist of two parts: a verb which denotes the orientation in space of a movement (e. g. 回 *huí* 'back',



上 *shàng* 'up', 下 *xià* 'down' etc.), and an element that specifies the source or the goal of the motion. The following examples illustrate:

(314) a. 阿明 把 自行车 骑-回-来 了。
Āmíng bǎ zìxíngchē qí-huí-lái le.
Aming BA bike ride-BACK-TO.HERE PFV
'Aming rode the bike back home.'

b. 张三 把 衣服 拿-下-去 了。
Zhāngsān bǎ yīfu ná-xià-qù le.
Zhangsan BA clothes take-down-FROM.HERE PFV
'Zhangsan took the clothes down.'

In order to represent the semantic contribution of the verbs specifying the orientation of the movement, we subtype *path-relation* (see hierarchy in Figure 7.1 on page 195) for the different orientations and include the corresponding relations in the semantics of the lexical entries of the verbs (see Figure 7.6).

The predicates select a complement which bounds the path by contributing a *motion-endpoint-relation*:

(315) $\begin{bmatrix} \textit{directional-verb} \\ \text{COMPS} \left\langle \left[\text{KEY } \textit{motion-endpoint-relation} \right] \right\rangle \\ \text{CONT} \mid \text{KEY } \textit{spatial-orientation-rel} \end{bmatrix}$

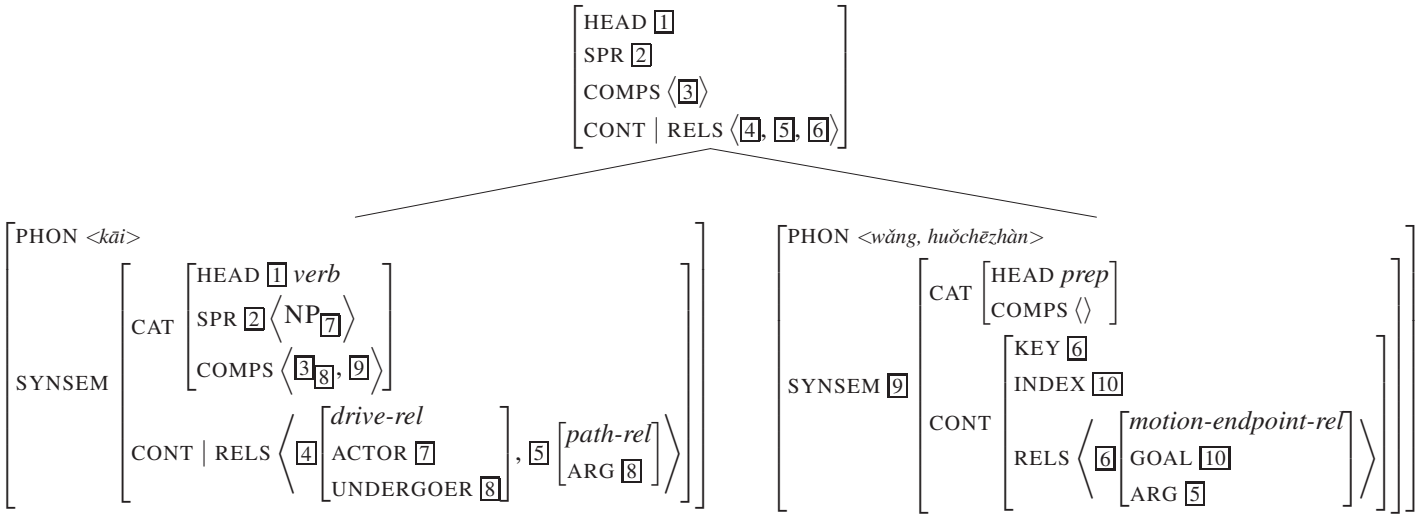


Figure 7.5: Structure of 开往火车站 *kāi wǎng huǒchēzhàn* (‘drive towards the train station’) in (313)

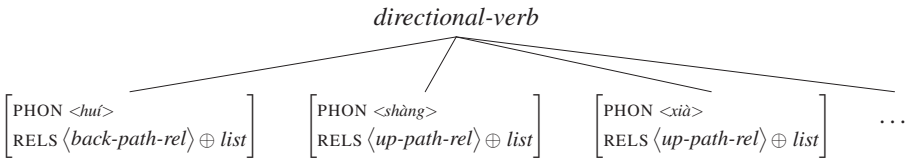
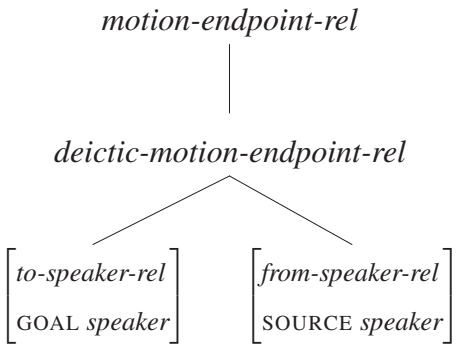


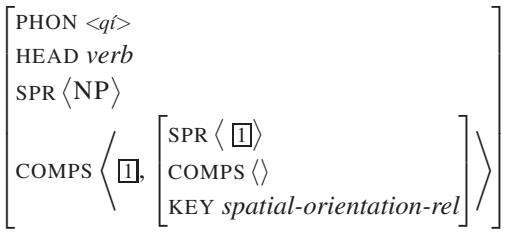
Figure 7.6: Partial lexical hierarchy for directional verbs

This complement can either be a deictic verb or a goal NP. For the two deictic predicates 来 *lái* ('move towards the speaker') and 去 *qù* ('move away from the speaker'), we posit the two deictic relations *to-speaker-rel* and *from-speaker-rel*:

(316)



With these descriptions in place, we can build the representation for the examples in (314). For instance, the lexical entry for the verb 骑 *qí* ('ride') in (314a) is specified as follows:



The verb selects for a complement which contributes a *spatial-orientation-rel*; by specifying this complement as saturated for its own complements, we ensure that it already has combined with the endpoint expression by virtue of (315). Further, the specifier is attracted onto the COMPS list of the selecting verb. Figure 7.7

depicts the syntactic composition; Figure 7.8 sketches the semantic contribution of the top node.

7.4 The analysis of resultatives

In this part, I present the analysis of resultative compounds that will be used for the subsequent analysis of the *bǎ*-construction. Resultative constructions deserve special attention since their frequent and variable use in the *bǎ*-construction makes it difficult to draw a clean line between the constraints and the effects of the two structures; besides, resultatives semantically overlap with the *bǎ*-construction in that they also describe causal relations between eventualities. In the following, I first formulate a unified semantics for resultatives. Then, I introduce a family of lexical rules which account for the different argument mappings that can be found in resultatives.

7.4.1 Semantics of resultatives

The general semantics of the Chinese resultative is fairly similar to resultatives in other languages:[1] an event leads to a new property obtaining of some entity. However, compared to other languages, Chinese resultatives manifest an unusual versatility in argument realization. In the following discussion of the semantics of the construction, I do not yet make any assumptions about specific participant role distributions, since the participant structures are different for different types of resultatives. Thus, the generic semantics of a resultative situation can be described

[1] See, for instance, Beavers (2012) for a general crosslinguistic overview of the properties and subtypes of resultatives and Simpson (1983), Goldberg and Jackendoff (2004), Kratzer (2005), Müller (2002b, Chapter 5) and Müller (2006) for some representative analyses of resultatives mainly in Indo-European languages.

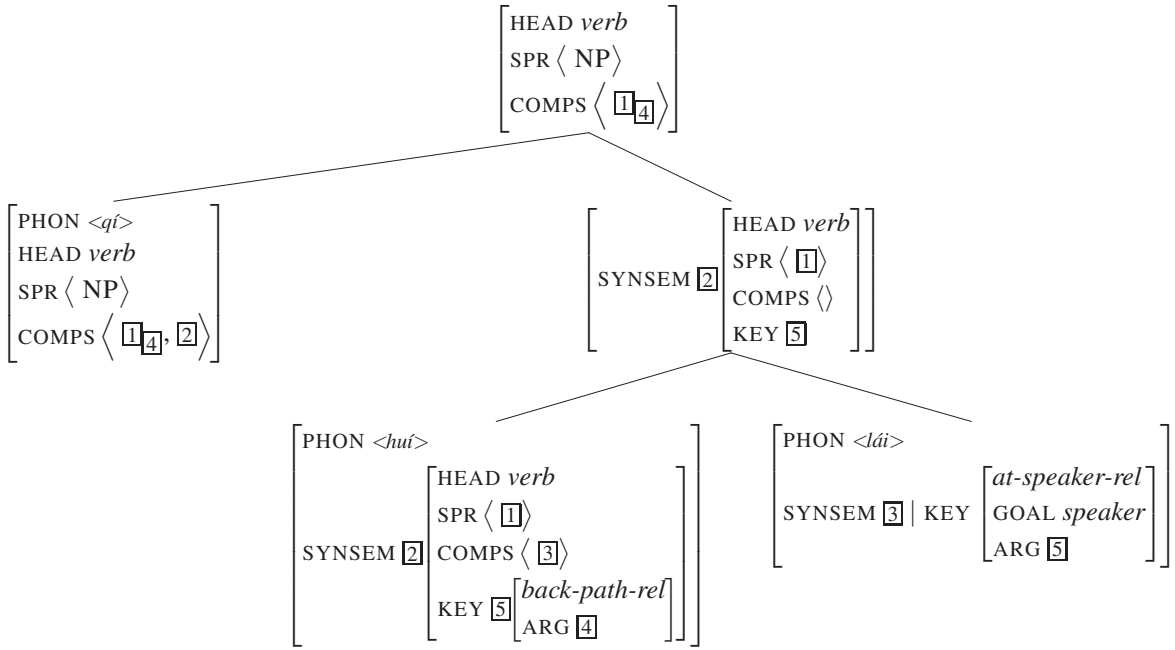


Figure 7.7: Syntactic combination for 骑回来*qí-huí-lái* (‘ride back’) in (314a)

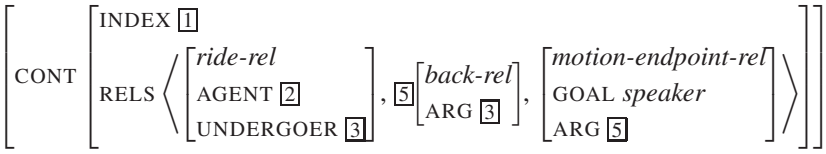


Figure 7.8: Semantic contribution of 骑回来 *qí-huí-lái* ('ride back') in (314a)

as a complex event embedding two composing eventualities:

(317) $\begin{bmatrix} \textit{resultative-rel} \\ \text{CAUSING } \textit{event-ind} \\ \text{CAUSED } \textit{state-ind} \\ \text{EVENT } \textit{event-ind} \end{bmatrix}$

CAUSING represents the event denoted by the main verb, whereas CAUSED embeds the resulting state. The 'coming about' of the resultative state is entailed by the overall resultative event, which receives an index of type *event*.

I assume that the change of state of the undergoing entity happens along a scale which is contributed by the resultative complement.[2] The resultative complement is a gradable or binary adjective and, thus, comes with a KEY value of type *scale-rel*. This scalar relation turns into a property of the argument undergoing the change by a *positive-degree-relation* that specifies that the property obtains to a positive degree (corresponding to the endpoint of the scale for upper-closed scales and to the contextual minimum for scales with contextually fixed standards; cf. (188) on page 122). The following AVM describes the relations list of the combination of a verb with a resultative complement:

(318) $\begin{bmatrix} \text{RELS} \left\langle \left[\text{EVENT } \boxed{1}\ \textit{event-ind}\right], \begin{bmatrix} \textit{resultative-rel} \\ \text{CAUSING } \boxed{1} \\ \text{CAUSED } \boxed{2}\ \textit{state-ind} \end{bmatrix}, \begin{bmatrix} \textit{positive-deg-rel} \\ \text{ARG } \textit{scale-rel} \\ \text{STATE } \boxed{2} \end{bmatrix} \right\rangle \oplus \textit{list} \end{bmatrix}$

[2] A similar scalar analysis of resultatives has already been proposed by Wechsler (2005).

The first relation corresponds to the semantic relation introduced by the verb; we see that the verb's index is of type *event*: stative verbs cannot combine with resultative complements. The second relation represents the causal relation associated with the resultative. The CAUSING value corresponds to the event described by the main verb; the CAUSED value embeds a degree relation. The argument of the degree relation is a *scale-rel*, which is contributed lexically by the resultative complement.

7.4.2 Lexical rules for resultatives

Having formulated a representation for the event structure of resultatives, we now consider the subtypes of resultatives that can be used in the *bǎ*-construction. I use lexical rules to analyze the three relevant subtypes of resultatives in Chinese, namely intransitive, transitive and transitivized resultatives.[3] The general line of analysis is the same as for the other types of complements (cf. Section 7.3): the main verb takes the resultative complement as an additional valent. In the following, I will use three rules which fix the different configurations of argument sharing between the main verb and the resultative complement for the three subtypes of resultatives. At the end of the section, I propose a "supertype" lexical rule which contains information that is redundant across the different rules.

[3] An additional possibility of argument distribution in resultatives which will not be considered here is as follows:

(i) 张三　　吃-饱　　饭　了。
Zhāngsān chī-bǎo　　fàn　le.
Zhangsan eat-full.RES rice MOD
'Zhangsan ate rice until he was full.'

The main verb is transitive, the argument of the resultative corresponding to the agent of the main verb. As will be explained in Chapter 8 (cf. (334) on page 232), this resultative subtype cannot be used in the *bǎ*-construction and, thus, will not be included in our analysis of resultatives.

Intransitive resultatives Intransitive resultatives are formed with an intransitive main verb; the resultative complement is predicated of the subject of the main verb:

(319) a. 张三 喝-醉 了。
Zhāngsān hē-zuǐ le.
Zhangsan drink-drunk.RES PFV
'Zhangsan drank until he was drunk.'

b. 孩子 哭-醒 了。
Háizi kū-xǐng le.
child cry-awake.RES PFV
'The child cried and awakened as a result.'

The lexical rule for intransitive resultatives is shown in Figure 7.9.

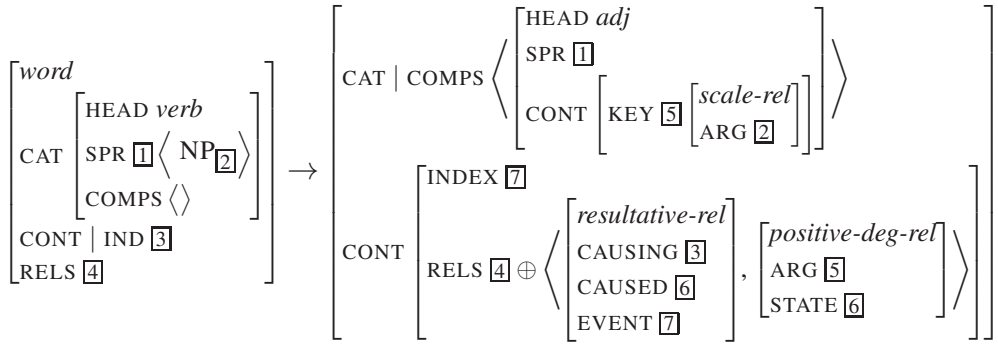
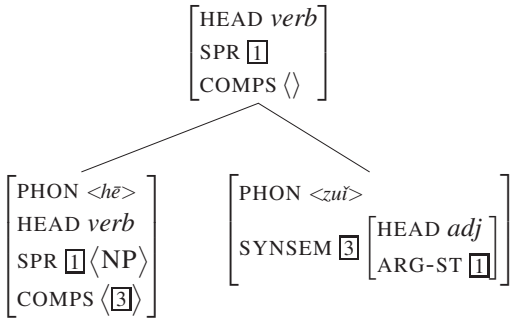


Figure 7.9: Lexical rule for intransitive resultatives

The left-hand side represents the relevant part of the input entry: the word is of type *verb*, selects for a subject via the SPR feature and takes no complements since it is intransitive. The INDEX and RELS features of the verb are bound by variables in order to ensure proper coindexing and structure sharing in the output. The right-hand side is the constraint on the verb that is to be used in the resultative construction. We see that the COMPS list is no longer empty: it contains a lexical adjectival element whose argument corresponds to the specifier of the input. The

semantics of this complement is constrained in terms of a *scale-relation* which takes the semantic index of the specifier, i. e. of the argument of the resultative complement, as its argument.

The following tree shows the syntactic combination of the verb 喝 *hē* ('drink') with the resultative complement 醉 *zuǐ* ('drunk'), as it is used in example (319a):



The semantic representation of the complex 喝-醉 *hē-zuǐ* ('drink to the extent of getting drunk') is as follows:

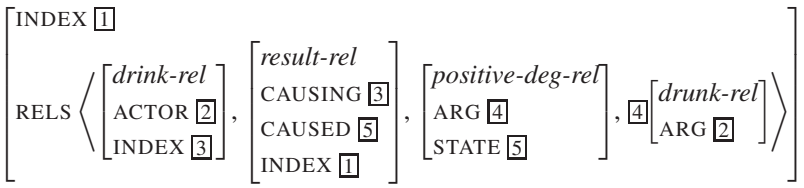


Figure 7.10: Semantics of 喝-醉 *hē-zuǐ* ('drink to the extent of getting drunk')

The resultative structure comes with a *result-rel* which establishes a causal relation between the event of drinking and the new state of being drunk that is denoted by the resultative complement. Thus, the first argument of the resultative relation is coindexed with the INDEX of the main verb. The second argument is a *become*-relation. It takes as argument a *positive-degree*-relation, which asserts that the property that is denoted by the resultative obtains to a positive degree.[4]

[4]The semantics of the *positive-degree*-relation corresponds to the semantics of the "covert" positive morpheme which is assumed for unmodified gradable adjectives and constrains the degree

The argument in the scale relation is coindexed with the actor of the main verb.

Transitive resultatives Transitive resultatives are formed with a transitive main verb; the resultative complement is predicated of the object of the main verb:

(320) a. 张三 打-死 了 狗。
Zhāngsān dǎ-sǐ le gǒu.
Zhangsan beat-dead.RES PFV dog
'Zhangsan beat the dog to death.'

b. 我 吃-光 了 饭。
Wǒ chī-guāng le fàn.
I eat-up.RES PFV rice
'I ate the rice up.'

The lexical rule for transitive resultatives is shown in Figure 7.11; it is in many respects similar to the rule for intransitive resultatives in Figure 7.9. However, since the verb is no more intransitive, the COMPS list of the input is no longer empty. It contains an element which, in the output, is semantically and syntactically structure-shared with the argument of the resultative.

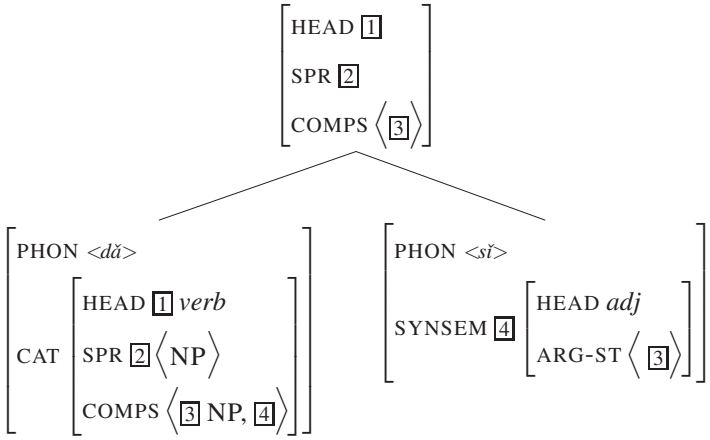
$$\left[\begin{array}{l} \textit{word} \\ \text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb} \\ \text{SPR}\left\langle \text{NP}\right\rangle \\ \text{COMPS } \boxed{1}\left\langle \text{NP}_{\boxed{2}}\right\rangle\end{array}\right] \\ \text{CONT}\left[\begin{array}{l}\text{IND } \boxed{3} \\ \text{RELS } \boxed{4}\end{array}\right]\end{array}\right] \rightarrow \left[\begin{array}{l} \text{CAT} \mid \text{COMPS } \boxed{1} \oplus \left\langle \left[\text{LOC}\left[\begin{array}{l}\text{HEAD } \textit{adj} \\ \text{ARG-ST } \boxed{1} \\ \text{CONT}\left[\text{KEY } \boxed{5}\left[\begin{array}{l}\textit{scale-rel} \\ \text{ARG } \boxed{2}\end{array}\right]\right]\end{array}\right]\right]\right\rangle \\ \text{CONT}\left[\begin{array}{l}\text{INDEX } \boxed{7} \\ \text{RELS } \boxed{4} \oplus \left\langle \left[\begin{array}{l}\textit{result-rel} \\ \text{CAUSING } \boxed{3} \\ \text{CAUSED } \boxed{6} \\ \text{INDEX } \boxed{7}\end{array}\right], \left[\begin{array}{l}\textit{positive-deg-rel} \\ \text{ARG } \boxed{5} \\ \text{STATE } \boxed{6}\end{array}\right]\right\rangle\end{array}\right]\end{array}\right]$$

Figure 7.11: Lexical rule for transitive resultatives

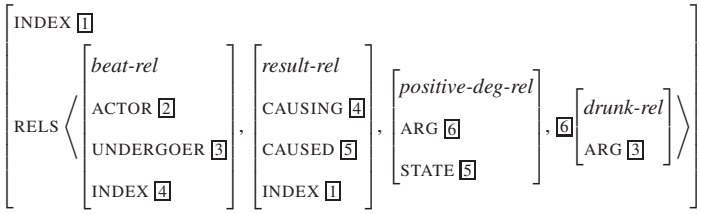
to a value that is higher than that of a contextually determined standard of comparison (following Kennedy and McNally, 2005b, p. 350–351; cf. also Section 4.2.2, in particular (188) on page 123.)

The syntactic combination of the verb 打 *dǎ* ('beat') and the resultative complement 死 *sǐ* ('dead'), as used in (320a), is illustrated in (321). (322) shows the semantic representation of the complex.

(321)



(322)



Transitivized resultatives Transitivized resultatives are formed with intransitive main verbs; the resultative selects an "additional" argument, thus making the whole complex transitive:

(323) a. 张三 把 酒吧 喝-干 了。
Zhāngsān bǎ jiǔba hē-gàn le.
Zhangsan BA pub drink-dry.RES PFV
'Zhangsan drank the pub dry.' (Bi, 2010)

b. 孩子 把 妈妈 哭-醒 了。
Háizi bǎ māma kū-xǐng le.
child BA mother cry-awake.RES PFV
'The child cried and the mother awakened as a result.'

The lexical rule for transitivized resultatives is shown in Figure 7.12.

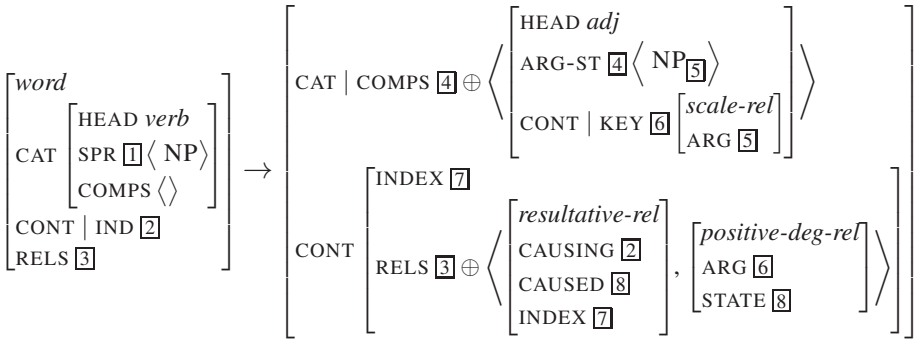
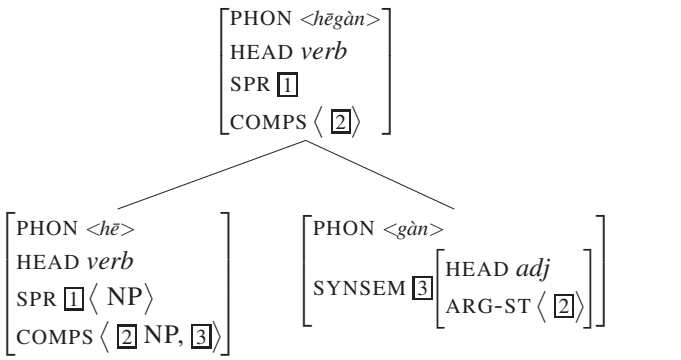
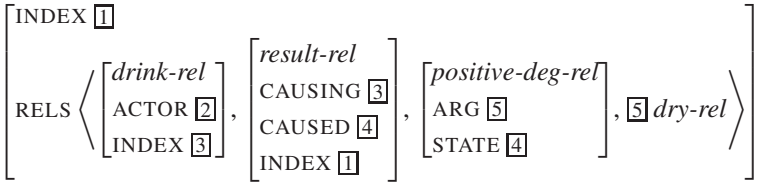


Figure 7.12: Lexical rule for transitivized resultatives

Again, the rule is very similar to the already presented rules for intransitive and transitive resultatives. As compared to the rule for transitive resultatives in Figure 7.11, the only difference is that the COMPS list of the input verb is empty. However, the COMPS list of the output is exactly as in 7.11, which captures the fact that its first element is selected not by the verb, but by the resultative complement.

The following two figures illustrate the syntactic combination and the semantic representation of the resulting complex:





7.4.3 Integration of resultatives into the type hierarchy

The three lexical rules presented in Figures 7.9, 7.11 and 7.12 share important parts of information. Figure 7.13 shows how this redundancy can be eliminated by positing a supertype lexical rule that accommodates the shared information; the subtypes specify only the features that are distinctive of the different construction types.

7.5 Summary

In this chapter, I have presented some preliminary formal assumptions required for the analysis of the *bă*-construction in the HPSG framework. In a first time, I have provided an HPSG formalization of the scalar relations which are required for the licensing of the *bă*-construction. Then, I have shown how the structures that often co-occur with the verb in the *bă*-construction can be analyzed in HPSG by extending the valence list of the "basic" lexical entry of a verb with an additional element. The semantic constraints on the additional elements have been formulated in scalar terms. Semantic compositionality ensures that the scalar relations are visible on the resultating combination of the verb with its complement. In the following chapter, I formalize the lexical entry for *bă* and show how it can be applied to the different types of *bă*-constructions.

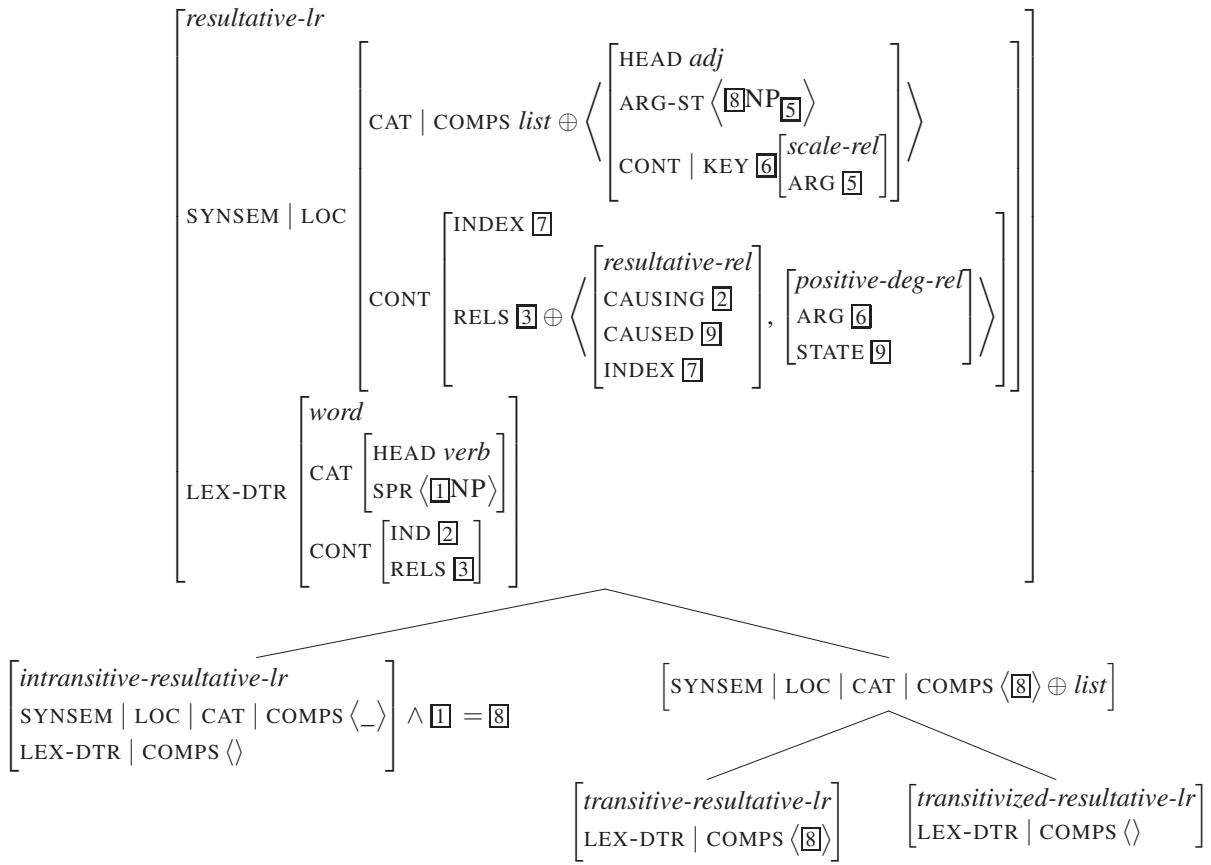


Figure 7.13: Hierarchy of lexical rules for Chinese resultatives

Chapter 8

Representation of the *bǎ*-construction in HPSG

The following analysis starts with a small set of constraints on the syntax-semantics interface and the subcategorization structure which hold for all subtypes of the *bǎ*-construction; in a later step, they are specified in order to accommodate the different argument distributions. Semantically, the analysis formalizes the constraints that have been worked out in Chapter 5. Syntactically, I use the argument attraction mechanism as described in Section 6.2.2. Scalar semantics allows for a general formulation of the semantics of the construction which is independent from the argument structure of a particular lexical instantiation, whereas argument composition models the different argument structures in terms of different configurations of valence and argument sharing between *bǎ* and the lexical predicate.

8.1 General constraints

8.1.1 The cause(r) requirement

According to the constraint postulated in (218) on page 132, *bă* requires a causing argument:[1]

(324) $[\![bă]\!] = \exists e \lambda x.\textsc{causer}(x)(e)\ldots$

The causing argument is embedded into a causative relation, which is specified as follows:

(325)
$$\begin{bmatrix} \textit{causative-rel} \\ \textsc{cause}\ \textit{index} \\ \textsc{caused}\ \textit{event-ind} \\ \textsc{event}\ \textit{event-ind} \end{bmatrix}$$

This relation looks fairly similar to the *resultative-rel* introduced for resultative complexes in (317) on page 211. There are two important differences: on the one hand, the CAUSED argument in a causative relation is an event, whereas it is a state in a resultative relation. On the one hand, the CAUSE argument is underspecified for its type in the causative relation, but constrained to an event in the resultative relation.

In general, the causing argument in the *bă*-construction is both semantically and syntactically variable. The following sentences show *bă*-constructions in which it bears different relations to the lexical predicate:

[1] Causing arguments can be causes or causers; the distinction between cause and causer in the nomenclature is not relevant for the licensing of the *bă*-construction. In the following, both terms are used; causers correspond to animate, volitional participants, whereas causes correspond to inanimate participants as well as eventualities. In the AVMs, I consistently use the CAUSE label.

(326) a. *causer = agent of main verb*:

我 把 那 个 苹果 吃 了。
Wǒ bǎ nà ge píngguǒ chī le.
me BA this CLF apple eat PFV

'*I* ate that apple.'

b. *cause = patient of main verb*:

这 瓶 酒 把 我 喝-醉 了。
Zhè píng jiǔ bǎ wǒ hē-zuǐ le.
this bottle wine BA me drink-drunk.RES PFV

'*This bottle of wine* made me drink to the extent of getting drunk.'

c. *cause = path of main verb*:

这 条 路 把 我 走-累 了。
Zhè tiáo lù bǎ wǒ zǒu-lèi le.
this CLF road BA me walk-tired.RES PFV

'I became tired as a result of walking *this road*.'

(or: '*This road* made me tired from walking it.')

d. *cause = natural force*:

雨水 把 她 的 衣服 淋-湿 了。
Yǔshuǐ bǎ tā de yīfu lín-shí le.
rainwater BA she ATTR clothes sprinkle-wet.RES PFV

'*The rainwater* wetted her clothes.'

e. *cause = external cause NP*:

这 件 事 把 他 哭-累 了。
Zhè jiàn shì bǎ tā kū-lèi le.
this CLF affair BA he cry-tired.RES PFV

'*This affair* made him cry to the extent of becoming tired.'

f. *cause = VP describing causing event*:

梦到 老公 死 了 把 李斯 哭-醒 了。
Mèngdào lǎogōng sǐ le bǎ Lǐsī kū-xǐng le.
dream husband die PFV BA Lisi cry-awake.RES PFV

'Dreaming that her husband had passed away made Lisi cry and awaken as a result.'

g. *cause = clause describing causing event*:

他 没 来 把 我 急-坏 了。
Tā méi lái bǎ wǒ jí-huài le.
he NEG.PFV come BA me worry-mad.RES PFV

'*The fact that he didn't come* made me very worried.'

We also see that the causing participant may belong to different ontological categories: it can be an animate or inanimate entity, a path, a natural force or an event. Besides, the causer position can be filled by constituents of different syntactic categories (NP in (326a–e), VP in (326f), S in (326g)). The above examples have one property in common: the causing argument is always realized in the sentence-initial position. This is captured by the following constraint:

(327) **Realization of the causing argument in sentence-initial position**: The argument satisfying the causer requirement of *bǎ* is realized in the sentence-initial position.

This generalization is formalized by linking the sentence-initial constituent, which corresponds to the element instantiating the SPR list of *bǎ*, to the CAUSE argument in the *causative-rel* of *bǎ*. The following constraint shows the relevant part of the lexical entry of *bǎ*:

(328)
$$\left[\begin{array}{l}\text{PHON } \langle bă \rangle \\ \text{CAT} \mid \text{SPR} \left\langle \left[\text{LOC} \mid \text{CONT} \mid \text{IND } \boxed{1}\right] \right\rangle \\ \text{CONT} \left[\begin{array}{l}\text{INDEX } \boxed{2} \\ \text{RELS} \left\langle \left[\begin{array}{l}\textit{causative-rel} \\ \text{CAUSE } \boxed{1} \\ \text{EVENT } \boxed{2}\end{array}\right] \right\rangle \oplus \textit{list}\end{array}\right]\end{array}\right]$$

By underspecifying the syntactic category of the specifier, this constraint covers not only cases where the sentence-initial position is instantiated by an NP, but also those sentences where it is filled by a constituent of a different syntactic category, such as a VP or a clause.

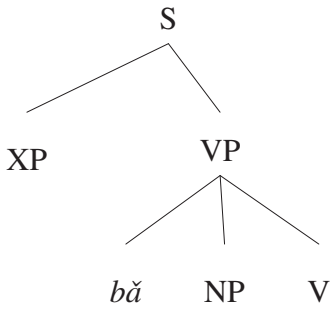
8.1.2 The general subcategorization structure of *bă*

Our second generalization concerns the status and the subcategorization structure of *bă*. In Chapter 2, we have seen that the syntactic status of *bă* is a matter of discussion. In constraint-based frameworks, two alternative treatments have been proposed: *bă* has been analyzed as a marker (Gang, 1997; Gao, 2000) and as a verb (Bender, 2000). The marker analyses use the *head-marker-structure* (Pollard and Sag 1994, p. 44–46, cf. also (293) on page 187) and treat the construction as a deviation from the standard SVO word order. However, these analyses do not consider a range of facts about the *bă*-construction which are central to the present analysis. On the one hand, they only cover the "canonical" form of the *bă*-construction and do not embrace the whole range of argument distribtions that are possible in the *bă*-construction. On the other hand, they do not provide a treatment of the semantic constraints on the use of the construction and the potential requirement of additional complements on the verb which is associated with these constraints (cf. (266) on page 158).

In order to account for these facts, I opt for a syntactic analysis of the *bă*-

construction which is similar to the analysis proposed by Bender (2000). *Bă* is analyzed as a verbal head selecting for a specifier, a nominal and a verbal complement. Thus, the general structure of a *bă*-sentence is as follows:

(329)



The following representation provides a general frame for the subcategorization structure of *bă*:

$$\left[\begin{array}{l}\text{PHON } \langle bă \rangle \\ \text{CAT} \left[\begin{array}{l}\text{HEAD } verb \\ \text{SPR } \langle \text{ XP} \rangle \\ \text{COMPS } \left\langle \boxed{1}\text{NP, V}\left[\begin{array}{l}\text{SPR } \boxed{2} \\ \text{COMPS } \boxed{3}\end{array}\right] \right\rangle\end{array}\right]\end{array}\right] \wedge append(\boxed{2},\boxed{3},\boxed{4}) \wedge member(\boxed{1},\boxed{4})$$

Figure 8.1: Subcategorization of *bă*

By virtue of (328), the specifier of *bă* is interpreted as the causing argument. The COMPS list consists of an NP and a verbal complement. The constraint in the second conjunct ensures that the first complement of *bă* is structure-shared with an element in the valence (i. e. an element which is present either on the SPR or on the COMPS list) of the verb. I do not yet specify the exact locus of the shared argument, which makes the representation at this point flexible enough to accommodate both those cases where the first complement corresponds to the object of the verb (e. g. (330a)) and those where it corresponds to the subject (e. g. (330b)):

(330) a. 孩子 把 妈妈 哭-醒 了。
Háizi bǎ māma kū-xǐng le.
child BA mother cry-awake.RES PFV
'The child cried and the mother awakened as a result.'

'The child made the mother cry and she awakened as a result.'

b. 这 个 梦 把 妈妈 哭-醒 了。
Zhè ge mèng bǎ māma kū-xǐng le.
this CL dream BA mother cry-awake.RES PFV
'This dream made the mother cry and she awakened as a result.'

'This dream cried and the mother awakened as a result.'

8.2 Intermediate summary

The following feature structure description summarizes the constraints presented so far:

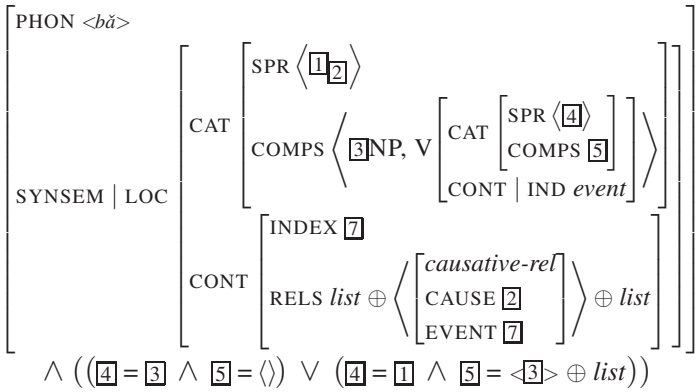


Figure 8.2: Constraints in the lexical entry of *bǎ*

The specifier of the lexical verb is always attracted by *bǎ*. It may land on the SPR or the COMPS list of *bǎ*, depending on whether the verb provides an additional NP complement which might fill the slot of the first complement of

bǎ. The disjunction in the relational constraint ensures that the COMPS list of the verb either is empty or, else, starts with the first complement of *bǎ*; thus, the NP complement of *bǎ* has to be picked from the two most prominent syntactic valents of the verb, namely its subject and its direct object. This constraint accords with the general observation that the *bǎ*-NP corresponds to a highly prominent argument of the lexical predicate (Li and Thompson, 1981a, p. 482–490; Huang, 2010, p. 390, *i. a.*).

8.3 Argument composition in the *bǎ*-construction

We have not yet touched upon the issue of the exact nature of argument composition between *bǎ* and the verbal complement; argument sharing has been constrained by membership relations between the valents of *bǎ* and of the embedded verbal complement. In the following, we will discuss how these relations can be further specified based on the valence and argument structure of the lexical predicate in order to constrain the well-formed argument distributions.

We first consider the argument distribution in *bǎ*-constructions where *bǎ* combines with a transitive verb that either has no additional dependents or has dependents that do not alter its argument structure, such as manner adverbs, directional complements or goal PPs. In these cases, the sentence-initial NP corresponds to the causer of the verb, whereas the NP following *bǎ* corresponds to the undergoer or the path, depending on the lexical participant structure of the verb. Thus, the COMPS list of the verbal complement consists of a single element. The disjunction in the second conjunct of (8.2) ensures that this element is raised by *bǎ* and structure-shared with its first complement:

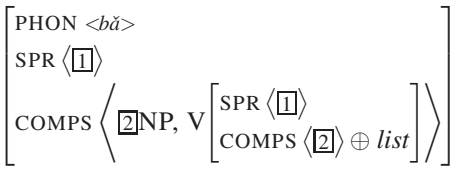


Figure 8.3: Argument composition in the *bǎ*-construction

Once more, we consider the following basic example:

(331) 张三　　把 苹果　　吃 了。
Zhāngsān bǎ píngguǒ chī le.
Zhangsan BA apple eat PFV
'Zhangsan ate the apple(s).'

Figure 8.4 illustrates the syntactic combination in (331); Figure 8.5 describes the semantic composition.

Turning to *bǎ*-constructions with resultatives, we find that the *bǎ*-construction can partially disambiguate the argument structure of resultative compounds. As has been observed in numerous studies (Huang and Lin 1992; Huang 1992; Li 1995, 1999; Her 2007; Lee and Ackermann 2011, *i. a.*), Chinese resultatives manifest an intriguing ambiguity. The following example illustrates:

(332) 张三　　追-累　　了 李斯。
Zhāngsan zhuī-lèi le Lǐsī.
Zhangsan chase-tired.RES PFV Lisi
'Zhangsan chased Lisi and as a result, Lisi got tired.' or
'Zhangsan chased Lisi and as a result, Zhangsan got tired.'

The resultative construction is formed with a transitive main verb and allows for two readings. Now, once we use the resultative complex in the *bǎ*-construction, the second reading is ruled out:

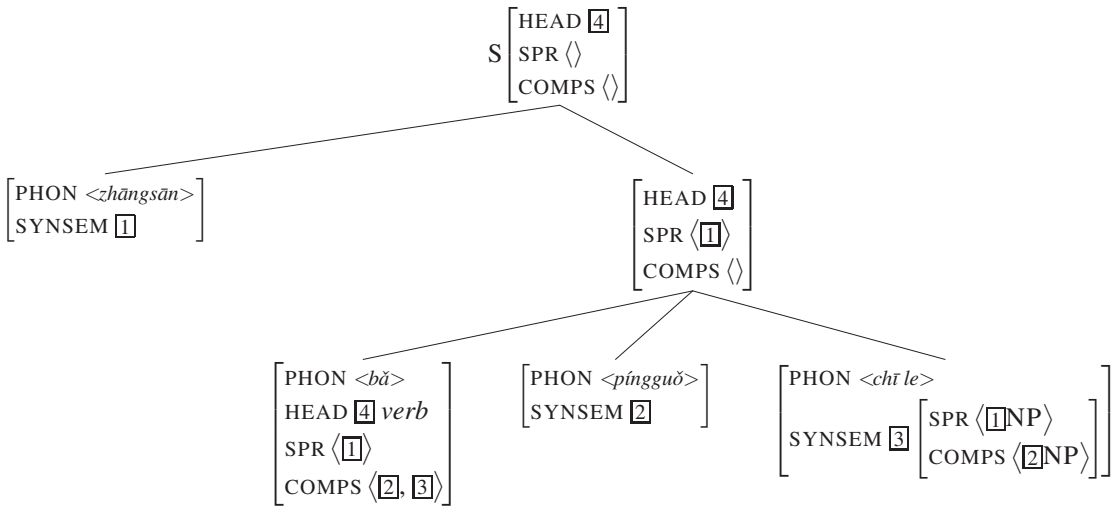


Figure 8.4: Syntactic analysis of (331): 张三把苹果吃了。('Zhangsan ate the apple.')

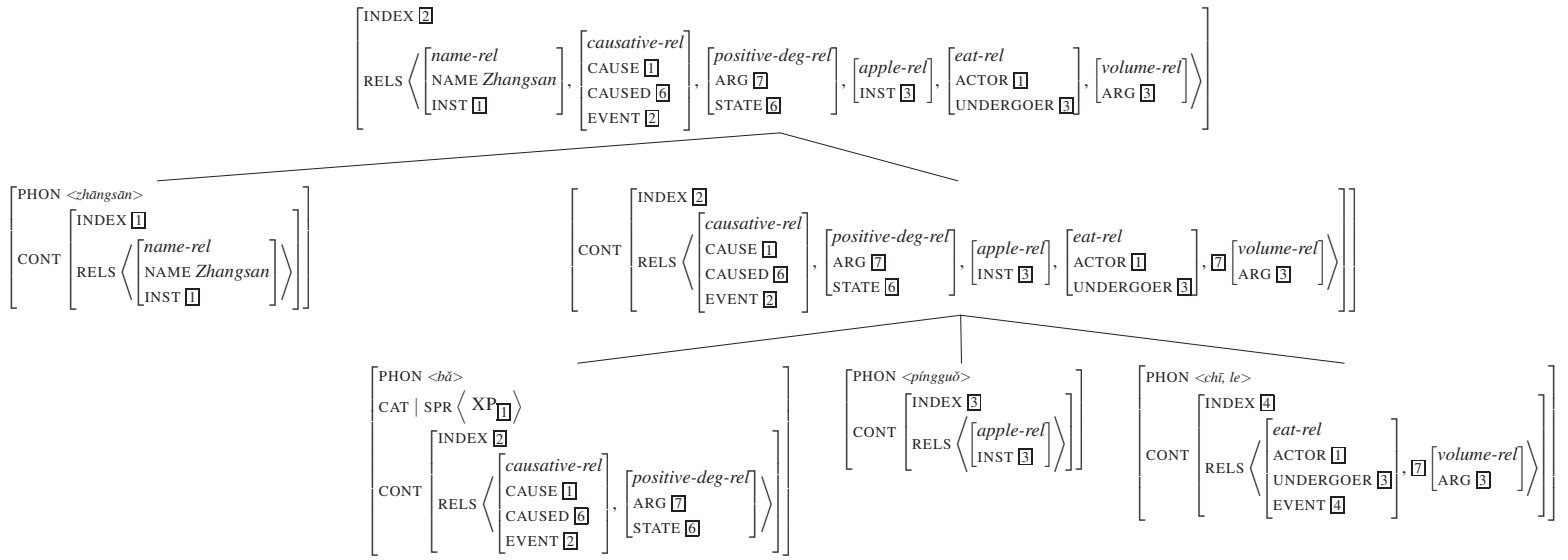


Figure 8.5: Representation of the syntax-semantics interface for (331): 张三把苹果吃了。('Zhangsan ate the apple.')

(333) 张三　　把 李斯 追累　　了。
Zhāngsan bǎ Lǐsī zhuī-lèi le.
Zhangsan BA Lisi chase-tired.RES PFV
'Zhangsan chased Lisi and as a result, Lisi got tired.'
'Zhangsan chased Lisi and as a result, Zhangsan got tired.'

Thus, the reading on which the *bǎ*-NP does not correspond to the theme of the resultative complement is out. This is captured by the following constraint:

(334) **Realization of the argument of a resultative as *bǎ*-NP**: If a resultative complement is used in the *bǎ*-construction, the argument of this resultative complement is realized as the *bǎ*-NP.

This constraint is further supported by an acceptability contrast which arises once we use resultatives with main verbs that have asymmetric selectional restrictions:

(335) a. 我 把 饭 吃-光　　了。
Wǒ bǎ fàn chī-guāng le.
I BA rice eat-empty.RES PFV
'I ate the rice up.'

b. * 我 把 饭 吃-饱　　了。
Wǒ bǎ fàn chī-bǎo le.
I BA rice eat-full.RES PFV
intended: 'I ate rice until I was full.'

In (335a), 光 *guāng* ('empty'), by virtue of its selectional restrictions, takes an inanimate, consumable argument, which can be identified with the undergoer argument of the main verb 吃 *chī* ('eat'). By contrast, the resultative complement 饱 *bǎo* ('full') in (335b) imposes a selectional restriction of animacy onto its argument. In (335b), the only animate argument is the actor of *eat*; its linking to the argument of *bǎo* ('full') would result in a violation of the constraint in (334), which explains the ill-formedness of (335b).

In the following, I illustrate and describe the combination of *bǎ* with the three subtypes of resultative constructions that have been modelled in Chapter 7.

Causative *bǎ*-constructions with intransitive resultatives The following examples show causative *bǎ*-constructions with intransitive resultatives:

(336) a. 这 件 事 把 他 哭-累 了。
Zhè jiàn shì bǎ Zhāngsān kū-lèi le.
this CLF affair BA Zhangsan cry-tired.RES PFV
'This affair made Zhangsan cry to the extent of becoming tired.'

b. 这 瓶 酒 把 我 喝-醉 了。
Zhè píng jiǔ bǎ wǒ hē-zuǐ le.
this bottle wine BA me drink-drank.RES PFV
'*This bottle of wine* made me drink to the extent of getting drunk.'

c. 第 一 次 英语 课 把 我 听-檬 了。
Dì yī cì yīngyǔ kè bǎ wǒ tīng-měng le.
ORD one time English class BA me listen-silly.RES PFV
'I got silly from listening to my first English class.'

We see that the sentence-initial NP does not correspond to an argument of the resultative complex; instead, it is selected by *bǎ*. A causative relation holds between the sentence-initial NP and the event denoted by the lexical predicate. We consider (336a) in more detail. By virtue of the lexical rule in Figure 7.9, the resultative complex 哭-累 *kū-lèi* ('cry to the extent of becoming tired') gets the following representation:

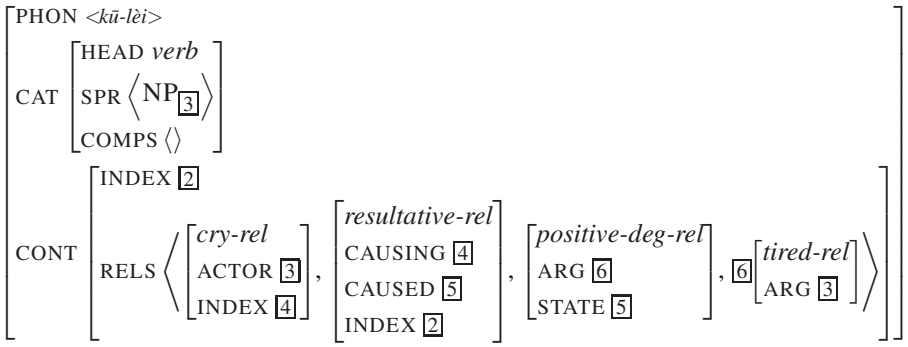


Figure 8.6: Semantic representation for 哭-累 *kū-lèi* ('cry to the extent of becoming tired')

The COMPS list of the resultative complex is empty. Once selected by *bǎ*, the relational constraint in Figure 8.2 ensures that the specifier of the predicate is identified with the first complement of *bǎ*. The syntactic composition for (336a) is shown in Figure 8.7; the semantic representation of the top node is shown in Figure 8.8.

The *bǎ*-construction with transitive resultatives The following examples illustrate *bǎ*-constructions with transitive resultatives:

(337) a. 张三 把 狗 打-死 了。
Zhāngsān bǎ gǒu dǎ-sǐ le.
Zhangsan BA dog beat-dead.RES PFV
'Zhangsan beat the dog to death.'

b. 我 把 饭 吃-光 了。
Wǒ bǎ fàn chī-guāng le.
I BA rice eat-empty.RES PFV
'I ate the rice up.'

c. 李斯 把 衣服 洗-干净 了。
Lǐsī bǎ yīfu xǐ-gānjìng le.
I BA clothes wash-clean.RES PFV
'Lisi washed the clothes clean.'

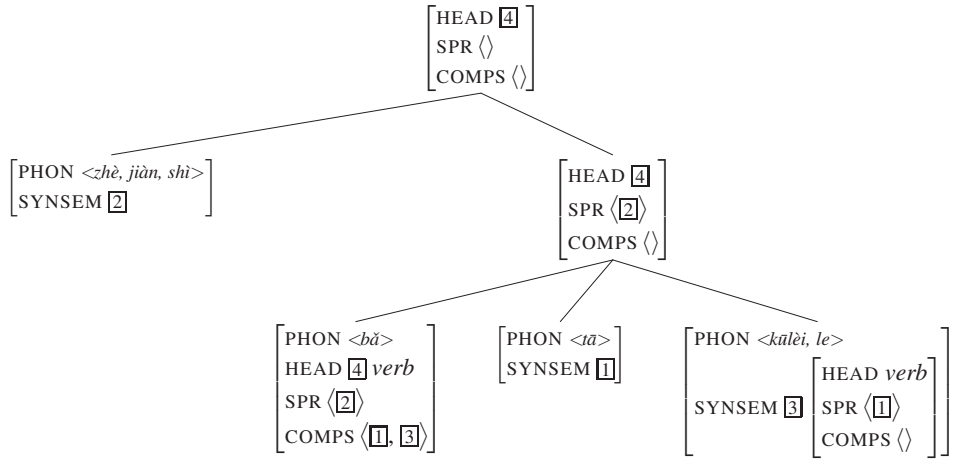


Figure 8.7: Syntactic analysis of (336a): 这件事把他哭累了。('This affair made him cry to the extent of getting tired.')

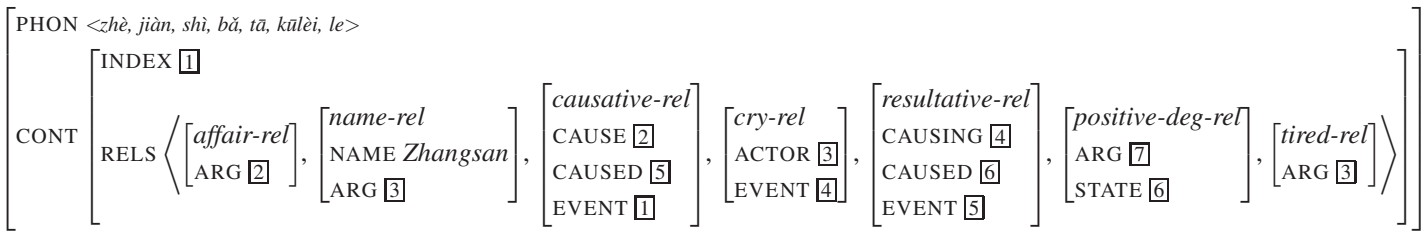


Figure 8.8: Semantic analysis of (336a): 这件事把他哭累了。('This affair made him cry to the extent of getting tired.')

We see that the argument distribution is just as for *bǎ*-constructions formed with bare transitive verbs (see Figure 8.3). By virtue of the lexical rule posited in (7.11), the resultative complex in (337a) gets the representation shown in Figure 8.9. The syntactic structure for (337a) is shown in Figure 8.10; the semantic representation of the top node is depicted in Figure 8.11.

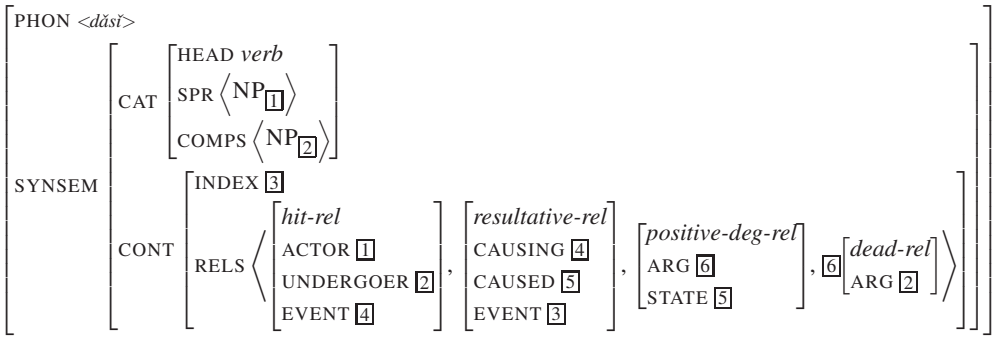


Figure 8.9: Representation of the resultative complex 打-死 *dǎ-sǐ* ('beat to death')

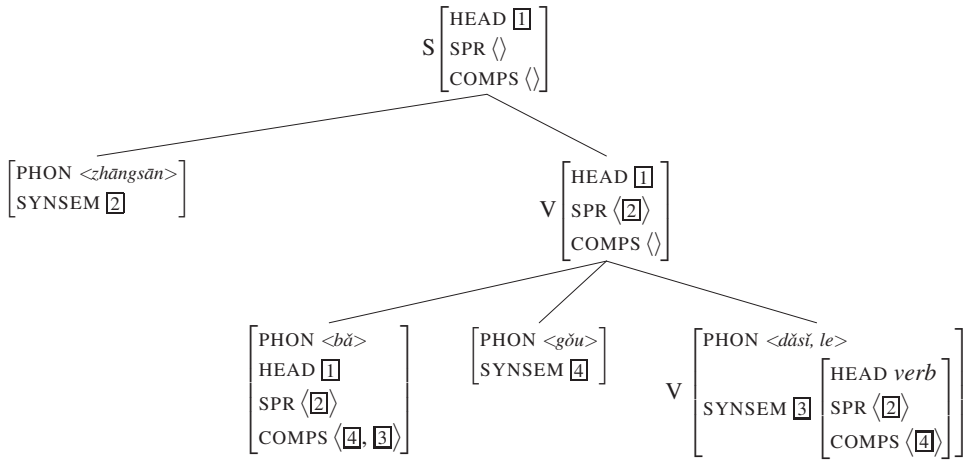


Figure 8.10: Syntactic analysis of (337a): 张三把狗打死了。('Zhangsan beat the dog to death.')

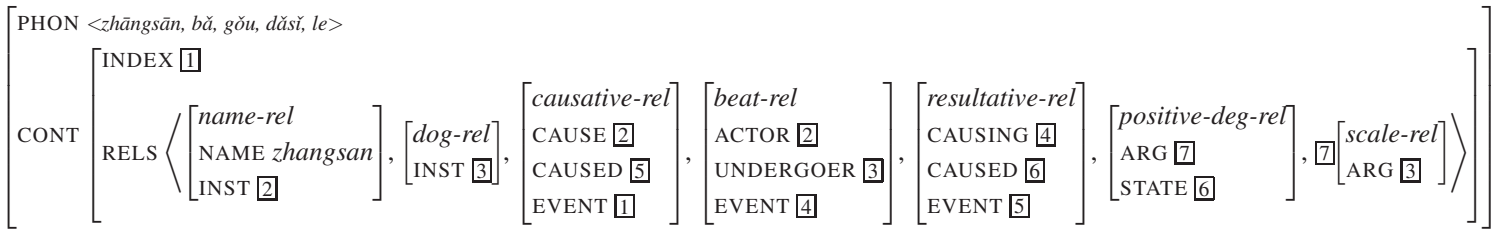


Figure 8.11: Semantic analysis of (337a): 张三把狗打死了。('Zhangsan beat the dog to death.')

The *bǎ*-construction with transitivized resultatives Finally, we consider *bǎ*-constructions with transitivized resultatives:

(338) a. 张三 把 酒吧 喝-干 了。
Zhāngsān bǎ jiǔba hē-gàn le.
Zhangsan BA pub drink-dry.RES PFV
'Zhangsan drank the pub dry.'

(Bi, 2010)

b. 孩子 把 妈妈 哭-醒 了。
Háizi bǎ māma kū-xǐng le.
child BA mother cry-awake.RES PFV
'The child cried and the mother awakened as a result.'

The AVM in Figure 8.12 describes the resultative complex in (338a), as obtained by the lexical rule posited in Figure 7.12. Figures 8.13 and 8.14 show the syntactic representation and the semantic contribution of the top node for (338a).

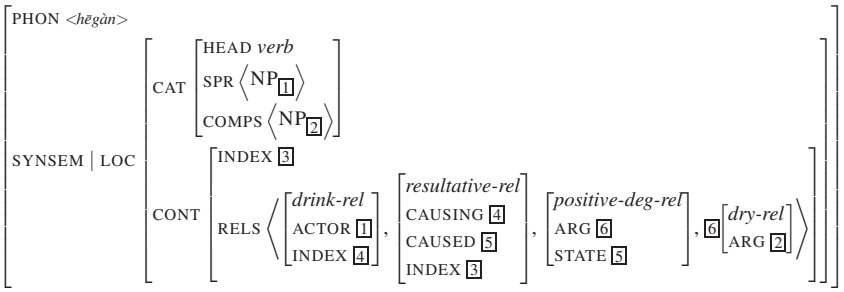


Figure 8.12: Representation of 喝-干 *hē-gàn* ('drink empty') in (338a)

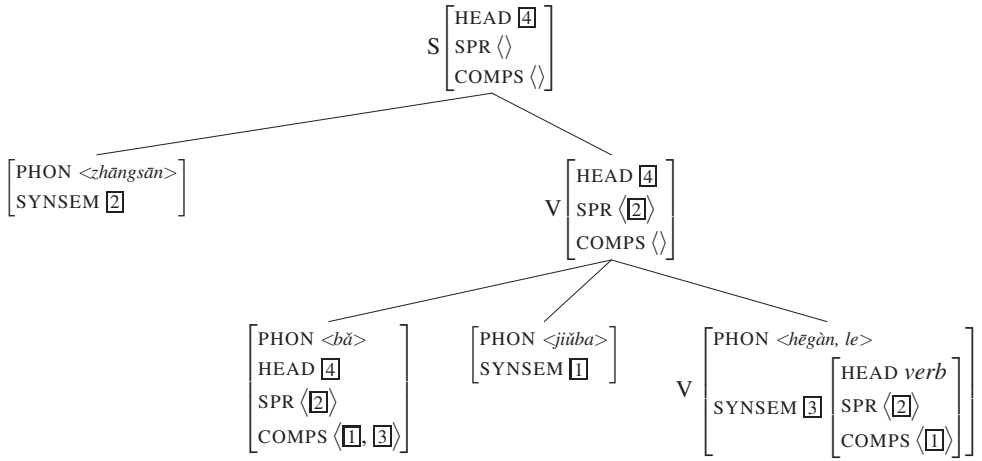


Figure 8.13: Syntactic analysis of (338a): 张三把酒吧喝干了。('Zhangsan drank the pub dry.')

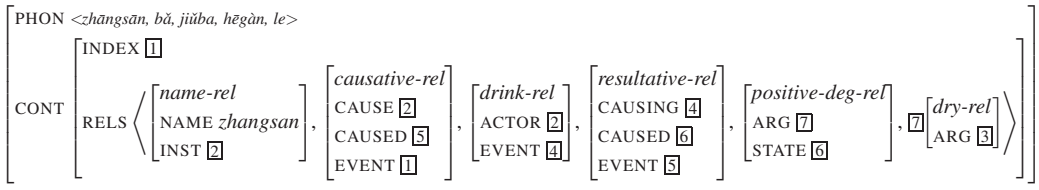


Figure 8.14: Semantic analysis of (338a): 张三把酒吧喝干了。('Zhangsan drank the pub dry.')

8.4 Summary of the analysis and discussion

In this chapter, I have shown how the semantic constraint on the *bă*-construction that was introduced in Chapter 5 can be integrated into an analysis that also accounts for the syntax of the construction. The syntactic structure proposed for the *bă*-construction accommodates *bă* as the head of the clause; it selects for two elements: the sentence-initial constituent and a verbal complement. The COMPS list of the verbal complement is either empty or contains a single NP element. If it is empty, the sentence-initial constituent is selected by *bă*, whereas the NP complement of *bă* is raised from the SPR list of the verb. If the COMPS list of the verb contains an NP, it is raised onto the COMPS list of *bă*, from where it is realized in the post-*bă* position. In this case, the SPR of the verb is realized as SPR of *bă* in the sentence-initial position.

The semantic constraint of *bă* requires it to take a causing argument; as this argument is always realized in the sentence-initial position, it is invariably linked to the element in the SPR list of *bă*. Besides, we have seen that the source of the causing argument is dependent on its semantic properties as well as the selectional restrictions of the lexical verb: thus, the causing argument is selected by *bă* unless it can be identified with an argument of the verb.

After establishing this common ground which applies to all *bă*-constructions, I have turned to the analysis of the different argument distributions. *Bă*-constructions with bare verbs or verbs combined with dependents that do not alter their argument structure are straightforward in their argument distribution: the sentence-initial NP corresponds to the actor or causer of the main verb, whereas the *bă*-NP corresponds to its undergoer; this "canonical" form of the construction might be the reason for its reputation as "object preposing" structure. However, the issue of argument structure gets more complex once we consider *bă*-constructions with resultative complements, where at least three different argument distributions

can be detected. The main generalization about the use of resultatives in the *bǎ*-construction is that the argument of the resultative is always realized as *bǎ*-NP. Beyond this constraint, the arguments of the main verb have a quite versatile distribution; this is captured by disjunctive constraints which describe the possible relations between the argument distribution of *bǎ* and the valence of the verb.

In Chapter 2, I have presented a range of analyses of the *bǎ*-construction. The analysis proposed in the present study has targeted three issues in the existing research, namely the indeterminacy of the syntactic status of *bǎ*, the restricted coverage of most analyses which address only a specific argument distribution in the construction and the vagueness of the proposed semantic constraints.

First, the discussion around the syntactic status of *bǎ* is difficult to ground: we have seen that the *bǎ*-construction has a fixed surface form and is limited in its interaction with other syntactic structures. It is thus hard to find syntactic evidence in favor of a specific syntactic category of *bǎ*. In a more general perspective, the question is difficult because of the general vagueness of part-of-speech definitions in Chinese. This has been illustrated in Section 2.2 for verbs: we have seen that a number of syntactic tests have been proposed to distinguish verbs from prepositions and coverbs in Chinese. However, these tests mostly define sufficient, but not necessary conditions for verbhood and thus do not provide an exhaustive characterization of the category of verbs in Chinese. In the present study, the part-of-speech issue has been neutralized by taking the semantic constraints associated with *bǎ* as a starting point. On the one hand, we have seen that *bǎ* may require the lexical verb to combine with additional dependents in order to satisfy its semantic constraint. On the other hand, the semantics of *bǎ* has been formulated in a way which made it maximally independent from specific argument structure configurations; thus, the argument distribution in a given *bǎ*-sentence is jointly determined by the event-structural constraints of *bǎ* and by the participant structure

of the lexical predicate.

Many studies of the *bǎ*-construction focus on specific argument structure configurations and only marginally consider the other argument distributions. Indeed, it is difficult to provide a unified account of the different argument structures and to find a shared underlying basis for them. The studies that do take into account the variety of possible argument structures as well as the potential of *bǎ* to select for its own arguments, such as Bender (2000), propose analyses of *bǎ* as the head of its clause. A head analysis has also been adopted in the present study; based on a scalar representation of event structure, I have formulated a semantic constraint that is valid for all argument distributions in the construction. Further, I have posited a general underspecified constraint on the subcategorization of *bǎ*. The argument structure is specified based on the valence specification of the lexical verb.

Finally, numerous studies on the semantics of the construction use semantic notions such as affectedness, disposal and causativity to "constrain" the semantics of *bǎ*. We have seen in Section 2.2.3 that these constraints, on the one hand, are not exhaustive. On the other hand, they have not yet been formalized in the context of the *bǎ*-construction. In the proposed analysis, I use a more abstract semantic representation in terms of scales. Without committing the analysis to real-world properties of events which turn out to be too restrictive in view of semantically less typical instances of the construction, scales provide a formally explicit construct which allows to describe the lexical instantiation while keeping the representation flexible enough to account for the semantic diversity of the construction.

Conclusion

The present study has considered the issues of argument structure and lexical choice in the Chinese *bǎ*-construction. Specifically, I have targeted the following three facts:

1. The Chinese *bǎ*-construction allows for a range of different argument distributions. In some cases, *bǎ* may select its own arguments.

2. The *bǎ*-construction places specific semantic constraints on its lexical predicate; thus, lexical verbs can be divided into three classes:

   (a) Verbs that occur in the *bǎ*-construction in "bare" form

   (b) Verbs that occur in the *bǎ*-construction with additional dependents that contribute to the satisfaction of the semantic constraint of *bǎ*

   (c) Verbs that do not occur in the *bǎ*-construction

3. The meaning of the *bǎ*-construction, when contrasted to the less marked SVO word order or to structures with reduplicated verbs (see Section 1.2), is perceived vaguely as "disposal", "affectedness" or the "exertion of an influence."

I have analyzed *bǎ* as a head which selects for a causer argument and an eventive VP complement. The sentence-initial position is instantiated by a causer, which can be selected by the lexical predicate or by *bǎ* itself.

Not all lexical predicates contributing an event argument and a potential causer argument can appear in the *bǎ*-construction; in the literature, this issue has been tackled with constraints that use semantic notions such as affectedness, disposal and boundedness. These notions eschew a precise formal definition; besides, even plausible intuitive conceptions of these notions have been shown to be non-exhaustive when it comes to capturing all instances of the *bǎ*-construction. In the presented analysis, I have loosened the constraints on real-world events and proposed a more permissive formal model that is based on the concept of scales. In the model-theoretic representation, I used notions of scalar semantics to formulate constraints on possible lexical predicates; thus, *bǎ* requires the semantic representation of its clause to contain a scale and a difference or extent value on this scale. Some verbs are inherently "scalar" and, in combination with a bounded argument, also provide a fixed difference value on the scale. These verbs can be used in the *bǎ*-construction in "bare" form. Other verbs do not come with scales; however, they can take additional dependents, such as resultatives, manner adverbs etc., which contribute scales; the resulting combination can be used in the *bǎ*-construction. This explains why some verbs that cannot be used in the *bǎ*-construction in bare form become acceptable once they are combined with an appropriate dependent.

My analysis mainly targets issues of semantics and of the syntax-semantics interface; however, the isolated consideration of these levels by no means provides a comprehensive account of the complexity of the *bǎ*-construction. The use of the *bǎ*-construction seems to be further conditioned by a range of competing motivations from syntax, information structure and lexical valence patterns. Syntactically, it is a well-acknowledged observation that the instantiation of the postverbal position in Chinese is constrained: it has been stated that the postverbal position can only accommodate one single element (Li, 1990). Thus, the use of a transitive

verb together with an additional dependent that can only occupy the postverbal position normally forces the preposing of the object. The *bǎ*-construction seems to be the least marked choice for those cases where the object is definite or specific; other preposing strategies are topicalization, the *bèi*-construction and verb reduplication (cf. Section 1.2).

On the part of information structure, authors have emphasized the "givenness" and the topical character of the *bǎ*-NP, which has sometimes been treated as a secondary topic (cf. Section 2.3.2). Thus, information structure might well be the level which determines the choice of a preposing strategy once syntax forces the preposing of the object.

Further, as demonstrated by Song (Song, 2006, cf. Section 1.2), the *bǎ*-construction seems to be the default choice for those semantic types of resultatives which do not allow the object to occur in postverbal position:

(339) a. * 他 炸-黄 了 茄子片儿。
Tā zhá-huáng le qiēzipiànr.
he fry-yellow.RES PFV aubergine
'He fried the aubergines until they became yellow.'

b. 他 把 茄子片儿 炸-黄 了。
Tā bǎ qiēzipiànr zhá-huáng le.
he BA aubergine fry-yellow.RES PFV
'He fried the aubergines until they became yellow.'

Finally, the question of lexical choice in the *bǎ*-construction leads us to another important point: in this study, I have considered conditions under which the *bǎ*-construction is licensed. In order to get a comprehensive picture of the construction, we would further require an investigation into the contexts in which the use of the *bǎ*-construction is actually necessary or preferable.

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Zusammenfassung

Die *bǎ*-Konstruktion ist eine der wenigen markierten Argumentstrukturkonstruktionen in der chinesischen Sprache. Sie ist im alltäglichen Sprachgebrauch wie auch in der schriftlichen Sprache sehr geläufig und doch komplex – obwohl Muttersprachler klare Intuitionen darüber zeigen, in welchen Kontexten sie benutzt werden darf und wo jeweils der semantische "Mehrwert" liegt, kann man die Verwendung und Bedeutung der Konstruktion nicht ohne Weiteres anhand der Konzepte, die aus Überlegungen zu Argumentstruktur und -realisierung hervorgegangen sind, charakterisieren. Falls man also eine umfassende Analyse der Konstruktion anstrebt, muss man diese Konzepte hinterfragen und sich auf die Suche nach passenden und wahrscheinlich neuen Kriterien machen, die diese im sprachlichen Umgang so selbstverständliche Konstruktion erklären.

Daneben illustriert die *bǎ*-Konstruktion einige wichtige Charakteristika der chinesischen Sprache, die zur Herausforderung für den formalen Linguisten werden. Einerseits verfügt die chinesische Sprache über eine schwache morphologische Ausdruckskraft und eine relativ feste Konstituentenstellung. In Bezug auf Argumentstruktur dürfte man erwarten, dass die Semantik von Argumenten hauptsächlich durch ihre Satzposition bestimmt ist, doch man wird eines Besseren belehrt: Chinesisch ist flexibel in der Realisierung von Argumenten, so dass einer bestimmten syntaktischen NP-Position oft eine Vielfalt von semantischen Rollen zugewiesen werden kann. Andererseits demonstriert die *bǎ*-Konstruktion auch die

pragmatische Orientierung der chinesischen Grammatik, die in dem starken Grad der Kontextabhängigkeit und in der Subjektifizierungsfunktion der Konstruktion sichtbar wird.

Die vorliegende Studie setzt bei der Semantik der *bǎ*-Konstruktion an und strebt eine Formalisierung der semantischen Beschränkungen, die die Verwendung von *bǎ* beschreiben, an. Syntaktische Aspekte werden in einem zweiten Schritt behandelt; dabei zeigt sich, dass die vorgeschlagene semantische Beschreibung auch die Auflösung diverser struktureller Probleme erlaubt, die häufig in der Literatur zur *bǎ*-Konstruktion diskutiert werden. Insbesondere zielt die Analyse auf die Formalisierung und Erklärung der folgenden Beobachtungen zur *bǎ*-Konstruktion ab:

- Die *bǎ*-Konstruktion stellt mehrere Möglichkeiten der Argumentrealisierung zur Verfügung; in manchen Fällen kann *bǎ* eigene Argumente annehmen, die vom lexikalischen Prädikat unabhängig sind.

- Die *bǎ*-Konstruktion kommt mit semantischen Einschränkungen auf die möglichen lexikalischen Prädikate einher; lexikalische Verben können demnach in drei Klassen unterteilt werden:

  - Verben, die ohne zusätzliche Abhängigkeiten in der *bǎ*-Konstruktion verwendet werden können.

  - Verben, die mit bestimmten zusätzlichen Abhängigkeiten kombiniert werden müssen, um in der *bǎ*-Konstruktion verwendet werden zu können. In diesem Fall tragen die zusätzlichen Abhängigkeiten zur Befriedigung der semantischen Beschränkungen von *bǎ* bei.

  - Verben, die weder mit noch ohne zusätzliche Abhängigkeiten in der *bǎ*-Konstruktion eingesetzt werden können.

- Die Bedeutung der *bǎ*-Konstruktion wird in der traditionellen chinesischen Linguistik in Übereinstimmung mit gängigen Intuitionen von Muttersprachlern mit “Verfügung”, “Affiziertheit” und der “Ausübung eines Einflusses” umschrieben.

Die im Folgenden beschriebene Analyse basiert auf Konzepten der skalaren Semantik. Diese Richtung der semantischen Analyse wurde bereits von Sapir (1944) eingeführt; in den letzten zwei Jahrzehnten wurden die Prinzipien der skalaren Semantik in modelltheoretischen Ansätzen formalisiert und auf diverse linguistische Phänomene angewendet, was die Entstehung einer reichen und anschaulichen Literaturbasis in diesem Bereich bedingt hat (Hay et al., 1999; Wechsler, 2001; Gawron, 2005; Caudal and David, 2005; Beavers, 2006; Kennedy and Levin, 2008; Levin, 2010; Kennedy, 2012; Beavers, 2011a, 2012; Beavers and Zubair, 2011, i. a.). In Kombination mit der semantischen Kategorie der Kausativität, die ebenfalls in diverse Studien der *bǎ*-Konstruktion Eingang gefunden hat (Sybesma, 1999; Guō, 2003; Li, 2003, i. a.), wird das Skalenkonstrukt in der vorliegenden Studie für die Formulierung einer Beschränkung im lexikalischen Eintrag von *bǎ* verwendet. *Bǎ* wird als Satzkopf analysiert; somit erstreckt sich die semantische Beschränkung auch auf das lexikalische Verb und seine Abhängigkeiten. Sie kann universell auf alle *bǎ*-Konstruktionen angewendet werden, da sie unabhängig von der Argumentstruktur des verwendeten lexikalischen Prädikats ist, wodurch sie auch die Erfassung der unterschiedlichen Optionen der Argumentrealisierung in der *bǎ*-Konstruktion erlaubt. Zudem wird die semantische Beschrnkung nicht auf das lexikalische Verb, sondern auf den gesamten Komplex angewendet, der aus dem Verb und seinen zusätzlichen Abhängigkeiten, wie Resultativ- und Direktionalkomplementen, Adverbien der Art und Weise usw. besteht, die ebenfalls ihren Beitrag zur Wohlgeformtheit einer Instanz der Konstruktion leisten können. Die so ausgearbeitete Semantik wird anschließend im

Rahmen der HPSG formalisiert und mit einer syntaktischen Darstellung bereichert. Wie auch die anfänglich formulierte semantische Beschränkung ist die syntaktische Analyse unbeeinflusst von der Argumentstruktur des instantiierenden lexikalischen Prädikates. Die Argumentstruktur einer Instanz der Konstruktion wird anhand der Interaktionen zwischen der Argumentstruktur des lexikalischen Prädikats und der mit den Konzepten der Skala sowie der Kausativität formulierten semantischen Beschränkung von *bǎ* abgeleitet.

Abstract

The *ba*-construction is one of the few marked argument structure constructions in Chinese and represents a typical challenge for linguistic theory – being very frequent in language use, its contexts of use and its meaning are subject to rather clear intuitions of native speakers; on the other hand, the usage and semantics of the *bǎ*-construction cannot be described in terms of commonly assumed semantic categories and still less in terms of constructs assumed in formal theories. Thus, the researcher is forced to question existing concepts and to dedicate himself to the search of criteria, possible novel ones, that might explain facts which are so naturally perceived, understood and differentiated by language users.

Besides, the *bǎ*-construction also illustrates some important characteristics of the Chinese language which turn into challenges for formal approaches. First, Chinese has a poor morphology and a rather unflexible constituent order; when thinking about argument structure, we might be tempted to think that the semantic part of argument structure can be "read" from surface constituent order. However, this is not the case – Chinese is rather versatile in argument distribution, and an NP that occupies a given syntactic slot can often be assigned a multitude of semantic roles. Second, the *bǎ*-construction also stands for the general pragmatic orientation of Chinese grammar, which shows off in its strong context dependence and the subjectification function.

The present study takes the semantics of the construction as a starting point.

It aims at a precise formalization of semantic constraints which characterize the cases in which the *bǎ*-construction is licensed. Structural aspects are treated in a second step since the proposed semantic formalization also allows to resolve major issues that have been raised in structural studies of the *bǎ*-construction. The central facts about the construction that are targeted and explained are as follows:

1. The Chinese *bǎ*-construction allows for a range of different argument distributions; in some cases, *bǎ* may select its own arguments.

2. The *bǎ*-construction places specific semantic constraints on its lexical predicate; thus, lexical verbs can be divided into three classes:

   (a) Verbs that occur in the *bǎ*-construction in "bare" form

   (b) Verbs that occur in the *bǎ*-construction with additional dependents that contribute to the satisfaction of the semantic constraint of *bǎ*

   (c) Verbs that do not occur in the *bǎ*-construction

3. The meaning of the *bǎ*-construction, when contrasted to the less marked SVO word order or to structures with reduplicated verbs, is perceived vaguely as "disposal", "affectedness" or the "exertion of an influence".

The proposed analysis is based on scalar semantics, a line of semantic reasoning introduced by Sapir (1944) and formalized and applied to different linguistic structures in a large body of recent literature (Hay et al., 1999; Wechsler, 2001; Gawron, 2005; Caudal and David, 2005; Beavers, 2006; Kennedy and Levin, 2008; Levin, 2010; Kennedy, 2012; Beavers, 2011a, 2012; Beavers and Zubair, 2011). The use of *bǎ* is semantically constrained in terms of scalarity and causation. This semantic description is independent of the participant structure of a given instantiating predicate, which allows it to accommodate different argument distributions. Further, we note that *bǎ* is analyzed as a head and thus allows to

constrain central semantic properties of the clause and, specifically, of the lexical predicate. The constraints are applied not to lexical verbs, but to the complex formed by the verb and its complements and modifiers. Thus, the verb is considered together with its additional dependents, such as resultative or directional complements, manner modifiers etc., which can also contribute to the satisfaction of the constraint. The semantics is formalized into an HPSG analysis which also accounts for structural aspects of the construction. It is accompanied by analyses of additional verbal dependent structures which can contribute to the licensing of the *bă*-construction. Just as the semantic constraint, the structural analysis is independent of the argument structure of a given lexical instantiation and derives the argument distribution in a given lexical instantiation from the interaction between the argument structure of the lexical predicate, the causer requirement and the scalar constraint of *bă*.

Eidesstaatliche Erklärung

Ich versichere hiermit, dass ich die vorliegende Dissertation selbstständig verfasst habe und keine weiteren als die angegebenen Hilfsmittel benutzt sowie die Stellen der Arbeit, die in anderen Werken dem Wortlaut oder dem Sinn nach entnommen sind, durch Angaben der Quellen sichtbar gemacht habe.

Janna Lipenkova

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Datum / Unterschrift