Everyday Multiple Language Use as a Potential Resource for the Self.

Positive Emotional and Motivational Consequences of a Language-Dependent Self-Representation.

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Abstract (English)

This dissertation addresses the self of people with everyday multiple language use. As the self arises from the social interactions of everyday life, we assume that everyday multiple language use is reflected in the representation of the self. Conducting five empirical studies, we investigate our theoretical assumptions about a language-dependent self-representation and its positive emotional and motivational consequences. In Study 1 and Study 2, we conducted secondary analyses of existing data on bilingual immigrant school students in Germany to investigate the impact of everyday multiple language use on spontaneous accessibility of self-knowledge. Findings from Study 1 showed that for students who typically speak German only when at school but not when at home, self-knowledge bound to the school-context was more easily accessible and self-knowledge bound to the home-context less easily accessible than for students speaking German across contexts. Analogously, findings from Study 2 showed that students who typically speak German only when at school accessed two more distinguishable sources of self-esteem, in terms of affective components of self-knowledge related to the school and family context, than students who speak German also when at home, when asked in the German-speaking context of the school. In order to more directly assess the extent to which individuals' different self-aspects are represented in different languages, i.e. compartmentalized along language lines, we introduce a newly developed bilingual version of a self-descriptive trait sorting task which we test with school students speaking English and Norwegian in Study 3. Applying the newly introduced procedure in Study 4, we assess the extent of *compartmentalization along language lines* in international university students who due to staying abroad currently used multiple languages in everyday life and examined the relation to their affective response towards negative bogus feedback. Findings revealed that participants' variation in self-esteem was small

when participants had chosen traits in both of their languages for their self-description in comparison to participants who had used traits in one language only in the bilingual trait sorting task. Findings from an experiment presented in Study 5, showed how accessing self-knowledge in an open self-description task in a language other than German helped participants of an online survey to buffer self-esteem threats caused by negative bogus feedback and, consequently, showed higher levels of self-esteem and more motivation to work on a second test than participants who described themselves in German after having received negative feedback in German. Taken together, our findings indicate that language offers an organizing principle for self-knowledge representation, which positively effects emotion and motivation in self-threatening situations. Based on our findings, we propose that everyday multiple language use should be considered as a potential resource for the self and discuss possible implications of our conclusion regarding theory and practice.

Abstract (German)

Gegenstand dieser Dissertation ist das Selbst von Personen, die im Alltag mehrere Sprachen verwenden. Da das Selbst aus sozialen Interaktionen des alltäglichen Lebens hervorgeht, gehen wir davon aus, dass sich die Verwendung mehrerer Sprachen im Alltag in der Repräsentation des Selbst niederschlägt. In fünf empirischen Studien überprüfen wir unsere theoretisch hergeleiteten Annahmen über eine sprachabhängige Selbstrepräsentation und die daraus resultierenden positiven Konsequenzen für Emotion und Motivation. In Studie 1 und Studie 2 führen wir Sekundäranalysen vorhandener Daten von mehrsprachigen Schülerinnen und Schülern mit Migrationshintergrund in Deutschland durch, um den Einfluss von Sprachverwendung auf die spontane Zugänglichkeit von Selbstwissen zu zeigen. In Studie 1 ergibt die Auswertung einer offenen Selbstbeschreibungsaufgabe, welche im deutschsprachigen Kontext Schule in Deutsch durchgeführt wurde, dass Schülerinnen und Schüler, die zuhause eine andere Sprache als Deutsch sprechen, spontan stärker auf schulbezogenes Selbstwissen und weniger auf Selbstwissen, welches sich auf den Kontext Zuhause bezog, zugriffen, als Schülerinnen und Schüler, die auch Zuhause Deutsch sprechen. Analog können wir in Studie 2 zeigen, dass Schülerinnen und Schüler, die Zuhause eine andere Sprache als Deutsch sprechen, auf zwei stärker voneinander unterscheidbare Quellen von Selbstwert zugreifen, wenn sie im deutschsprachigen Kontext Schule danach gefragt werden. In Studie 3 setzen wir eine neu entwickelte bilinguale Version einer Traitadjektiv-Sortieraufgabe zur Selbstbeschreibung ein und erproben dadurch, das Ausmaß der Sprachabhängigkeit in der Selbstrepräsentation Englisch-Norwegisch-sprechender Schülerinnen und Schüler direkt zu erfassen. In Studie 4 untersuchen wir den Zusammenhang zwischen der emotionalen Reaktion auf negatives Bogus-Feedback und dem Ausmaß der *compartmentalization along language lines* von internationalen

Studierenden, die aufgrund ihres Auslandsaufenthaltes im täglichen Leben unterschiedliche Sprachen verwenden, welches mithilfe des in Studie 3 vorgestellten neuen Verfahrens erfasst wurde. Unsere Ergebnisse zeigen, dass die Veränderung im Selbstwert gering war, wenn die Teilnehmenden Traitadjektive in ihren beiden Sprachen zur Selbstbeschreibung gewählt hatten, während bei Teilnehmenden, die ausschließlich Traitadjektive in einer Sprache für ihre Selbstbeschreibung gewählt hatten, stärkere Veränderungen im Selbstwert gezeigt werden konnten. Die Ergebnisse eines Experiments, welches wir in Studie 5 präsentieren, zeigen, wie der Zugriff auf Selbstwissen in einer offenen Selbstbeschreibungsaufgabe in einer anderen Sprache als Deutsch den Teilnehmenden einer Online-Befragung dabei half, eine durch Bogus-Feedback ausgelöste Selbstwertbedrohung abzuschwächen und in der Folge ein höheres Selbstwertgefühl und mehr Motivation zur Bearbeitung eines zweiten Tests angaben, als Teilnehmende, die sich nach dem in Deutsch präsentierten negativen Feedback in Deutsch beschrieben. Zusammengefasst zeigen unsere Ergebnisse, dass Sprache ein Organisationsprinzip für die Repräsentation von Selbstwissen bietet, welches mit positiven emotionalen und motivationalen Konsequenzen in selbstwertbedrohlichen Situationen einhergeht. Auf der Grundlage unserer Befunde plädieren wir dafür, die alltägliche Verwendung mehrerer Sprachen als eine potentielle Ressource für das Selbst zu verstehen und erörtern mögliche Implikationen unserer Schlussfolgerung für Theorie und Praxis.

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« Like so much in our science,

the self is multiplicity –

a complex, coming together,

of constituents whose individual,

and often unique,

contributions to the whole must,

of necessity,

be accounted for

if understanding ultimately can be achieved »

Stanley B. Klein

Special Issue ‘What is the Self?'

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INTRODUCTION

Imagine a person who is a university professor, who has two children, a partner, and fish. When at work, asking this person to describe herself, she might possibly tell that she is enthusiastic about her research, that she is an ambitious scientist and a demanding supervisor, and how satisfied she is about a recently accepted grant. When at home, asking the same person to describe herself, her self-description possibly contains being a soft-hearted and caring mother, who enjoys spending time with her husband, and that she is in charge of preparing dinner for tonight. This context-dependent access on what people think and feel about themselves is caused by the multi-faceted representation of self-related knowledge in memory, and has been described in the literature as the dynamic of the self (e.g., Hannover, 1997; Markus & Wurf, 1987).

Now imagine this person is using multiple languages in her everyday life. When at university she is using another language for giving her lectures, discussing with colleagues, reading assignments, and preparing publications than when she is at home with her family. What would happen if this person was asked to describe herself when at university in the language she usually uses at home? Would she access more family-related self-knowledge or would she nevertheless describe herself as an enthusiastic researcher? Would she still be motivated to prepare for her next lecture, or would it make her start worrying about what to cook for dinner? And would she still be glad about receiving the grant, or would the anger about her children who did not take care of the fish lately influence her emotion? To provide dependable answers to these sorts of questions we lack empirical research that takes into account for the influence of everyday multiple language use on self-representation. This

dissertation aims to narrow this research gap and sets out to investigate the impact of everyday multiple language use on the self.

Anecdotal evidence suggests, that individuals who use multiple languages in their everyday lives[1] often feel as if they had different selves, depending on the language they are using (Grosjean, 2010; Koven, 2007). In fact, asking more than one thousand individuals with everyday multiple language use in a web questionnaire 'Do you feel like a different person sometimes when you use your different languages?', Pavlenko (2006) found that nearly two-thirds of respondents offered an affirmative answer. While the perception of feeling different when switching languages has often been attributed to differences between *languages* (Pavlenko, 2006), our attempt to explain multiple language-dependent selves reads that *using* multiple languages in everyday life impacts on the representation of the self. More specifically, the basic assumption we are pursuing in this dissertation is that everyday multiple language use involves a language-dependent self-representation. We assume that the notion of a language-dependent self-representation resulting from everyday multiple language use provides a more systematical approach to examine language-dependent accessibility of self-knowledge. Beyond that, we assume that a language-dependent self-representation involves positive consequences for emotion and motivation.

[1] "Bilinguals are those who use two or more languages (or dialects) in their everyday lives" (Grosjean, 2010, p. 4). According to this definition this dissertation is about people who are bilingual, and their self respectively. So why are we using the somewhat cumbersome term *everyday multiple language use* instead? There are two reasons: 1. The term bilingual is associated with a number of myths (see Grosjean, 2010), and we do not want to provoke any misconceptions on the part of the reader. 2. Our research focusses on the effects produced by regularly interacting while using different languages. Therefore, *everyday multiple language use* directly refers to exactly what we are interested in. In cases where we use the term bilingual, e.g. when referring to the work of others, we understand bilingual synonym to using multiple languages in everyday life.

Using multiple languages in everyday life is a reality for millions of people (Grosjean, 2010). A recent Eurobarometer survey on *Europeans and their languages*, for instance, reveals that 24% of citizens of the European Union (almost) every day use different languages in different contexts of their everyday life, e.g when at work, when communicating with friends, or when with members of their family (European Commission, 2012). Because bilinguals typically use their languages in different contexts, for different purposes, in different situations, with different people (Grosjean, 2010) bilingualism is often assumed to be a challenge. PISA results showing that students who speak another language than the language of instruction when at home, perform more poorly than their peers who speak the language of instruction also when at home, for instance, are explained by these students having less practice in the language of the school, hence causing obstacles for students to succeed academically (Stanat & Christensen, 2006). By showing that everyday multiple language use is a potential resource for the self, we aim to provide evidence for a resource-oriented perspective on everyday multiple language.

As we will argue in the following chapter, the social cognition perspective on the self provides the theoretical framework for our notion of a language-dependent self-representation. Drawing on the model of the dynamic self (Hannover, 1997) and the self-complexity model (Linville, 1985, 1987), we will develop assumptions about language-dependent self-representation resulting from everyday multiple language use and its consequences for emotion and motivation. To substantiate our theoretical assumptions, as we proceed, we will introduce relevant research findings from studies conducted with individuals who are using multiple languages in their everyday lives, e.g. research on bilinguals' autobiographical memory (see Schrauf & Durazo-Arvizu, 2006, for a review), or cultural frame switching studies (Benet-Martínez, Leu, Lee, & Morris, 2002; Chen & Bond, 2007,

2010). To conclude with the theoretical part of this dissertation, we summarize the assumptions we seek to address in the empirical studies of this dissertation.

The empirical part of this dissertation is comprised of five studies. First, we will examine our assumptions about a language-dependent self-representation resulting from everyday multiple language use. Specifically, in two studies with bilingual immigrant students in Germany, we investigate the spontaneous accessibility of self-knowledge while at school and show how context-dependent language use impacts on the spontaneous accessibility of context-specific self-knowledge (Study 1) and modulates the input of context-specific emotion on global self-esteem (Study 2). In Study 3, we introduce a new approach to assessing language-dependent self-representation in individuals with everyday multiple language use. Employing our newly developed method to capture the extent to which a person's multiple selves are differentiated by language, i.e. compartmentalized along language lines, in Study 4, we explore our assumption that a language-dependent self-representation offers positive emotional consequences. Finally, in Study 5, our assumptions about positive emotional and motivational consequences arising from a language-dependent self-representation are further investigated.

Finally, the empirical studies are followed by a general discussion of the research conducted in this dissertation. We summarize the key findings of the empirical studies and discuss our results with regard to our theoretical assumptions and the current state of research. Taking the limitations of the current studies into account, we discuss the implications of our findings for theory and practice and propose future research perspectives. Our conclusion emphasizes our notion of understanding everyday multiple language use as a potential resource for the self.

THEORETICAL BACKGROUND AND EMPIRICAL FOUNDATIONS

The Multiple Self

The self has been introduced as a key concept of psychology more than a century ago. In his book *Principles of Psychology*, published in 1890, James conceptualizes the self as arising out of interaction with the social environment. As a consequence of varying interaction partners and diverse social contexts, multiple selves emerge:

> Properly speaking, *a man has as many social selves as there are individuals who recognize him* and carry an image of him in their mind. (...) But as the individuals who carry the images fall naturally into classes, we may practically say that he has as many different social selves as there are distinct groups of persons about whose opinion he cares. He generally shows a different side of himself to each of these different *groups*. Many a youth who is demure enough before his parents and teachers, swears and swaggers like a pirate among his 'tough' young friends. We do not show ourselves to our children as to our clubcompanions, to our customers as to the laborers we employ, to our own masters and employers as to our intimate friends. From this there results what practically is a division of the man into several selves; and this may be a discordant splitting … or it may be a perfectly harmonious division of labor. (James, 1890, p. 294, italics in original)

For James as well as for other scholars engaged in the self for many decades it remained unexplained how multiple selves can co-exist and function side by side (see Hannover, 1997, for a comprehensive review). Self-research was widely confined to questions on the content of the self, i.e. what we know and believe to be true about ourselves, without considering the structure of the self (see McConnell & Strain, 2007). Only with the advent of the social cognition paradigm, in the second half of the 1970s, assumptions about the structure of the

self and the representation of multiple selves in memory developed and significantly advanced the understanding of the self and its extensive consequences on cognition, emotion, and motivation (McConnell, Brown, & Shoda, 2013).

In this dissertation, we derive our assumptions about the impact of everyday multiple language use on the self from two models of self-representation originating from social cognition perspective. Before we present these models of self-representation, in the following section, we briefly outline the social cognition perspective on the self.

The Social Cognition Perspective on the Self

The social cognition paradigm emerged as a result of the convergence of social psychological research with cognitive psychological issues, and vice versa, hand in hand with the conviction that social cognition is no different from other forms of cognition (Schneider, 1991).

The social cognition paradigm acts on the assumption that sufficient insight into social psychology cannot be achieved based on stimuli-response-theory. Instead, it is assumed that mental processes are the adequate level of analysis. Mental processes are understood as the processing of information which is subject to a defined sequence (see Figure 1 for a schematic presentation of the standard sequence of information processing): Information is encoded and stored in form of mental representations in memory. Mental representations can be retrieved from memory, whereby cognitive operations may cause the retrieved information to vary from the original information (Strack, 1988).

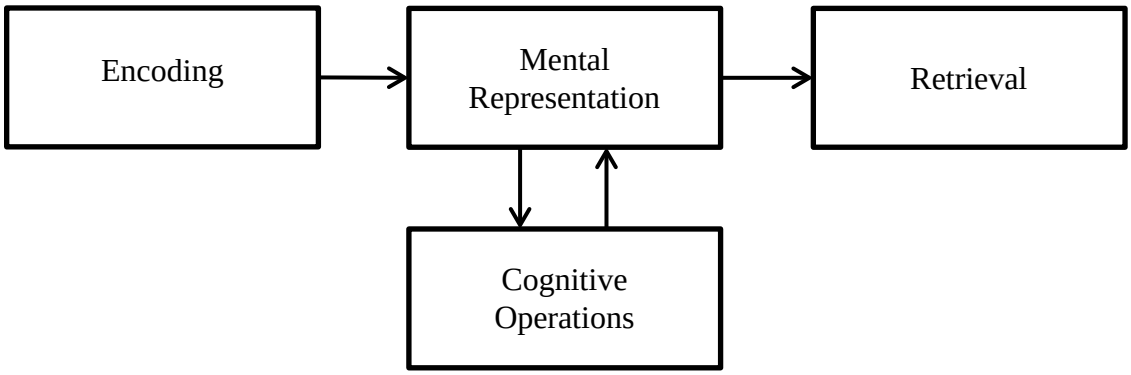

Figure 1 Standard sequence of information processing (adapted from Strack, 1988)

According to the assumption that social cognition is no different, it is assumed that self-related information follows the same sequence of encoding, storage, and retrieval. Consequently, within the framework of the social cognition perspective, the self is understood as a cognitive structure in memory, the so-called self-concept (see Carlston & Smith, 1996, for a review). The self-concept encompasses the mental representations of self-related knowledge that the individual generates across the lifespan (e.g., Hannover, 1997; Linville, 1985; Markus & Wurf, 1987; McGuire & Padawer-Singer, 1976; Schleicher & McConnell, 2005).

A further basic assumption that the social cognition paradigm acts on is that existing knowledge structures are crucial in the processing of information. As sort of top-down processing, existing knowledge structures guide the perception, encoding, and storage of information (Schneider, 1991; Strack, 1988). Following the same mechanisms, a person's self-concept impacts on the processing of incoming information about the self, i.e. self-related information is perceived, encoded, and stored in relation to existing self-knowledge (see Greenwald & Pratkanis, 1984 for a review).

Language-Dependent Memory

So far, we have shown the information processing sequence, which according to the social cognition perspective is also true for the processing of self-related information represented in the self-construct: Perceived information is encoded and stored in form of mental representations in relation to existing knowledge structures in memory and can be retrieved when required in later situations. Before we continue presenting two models on self-concept representation, in the following, we turn towards studies that have shown that information processing is subject to language as this will help us generate our assumptions about a language-dependent self-representation. To anticipate, the general pattern shown in studies with bilingual individuals is that multiple language use produces language-dependent memory.

Marian and Fausey (2006), for instance, found evidence for a match-mismatch-effect between the language of encoding and the language at retrieval. In their study, bilingual participants received information from certain academic domains in each of their languages. Asking questions in either the same language as the information had been given or the other language showed that retrieval of information was more accurate and faster when the languages of encoding and retrieval matched than when they mismatched. In another study, Marian and Kaushanskaya (2007) revealed that English-Mandarin bilinguals accessed contents of general knowledge depending on the language of retrieval: When asked in English to name tourist attractions, participants were more likely to retrieve knowledge on tourist attractions like the Grand Canyon than the Great Wall of China, and vice versa when asked in Mandarin. Language-dependent retrieval was attributed to the fact that tourist attractions had either typically been acquired in English or in Mandarin. As a consequence, tourist attractions were more easily accessible for which the language at retrieval matched the language of the original encoding.

Bilinguals' Autobiographical Memory

We assume that self-related knowledge is also encoded in language-specific ways. Evidence supporting our assumption about language-dependent encoding comes from research on bilinguals' autobiographical memory. Autobiographical memory is to be understood as a generic term for personal memories of specific events which are an essential component of a person's self-concept from the preschool years on (Fivush & Nelson, 2004; Nelson & Fivush, 2004).

In studies on bilinguals' autobiographical memory, language-dependent recall of self-knowledge has typically been investigated in bilinguals whose language use had changed due to migration. Marian and Neisser (2000), for instance, conducted a study with bilinguals whose language use had changed due to migration from Russia to the United States. Having participants recall personal memories in response to cue words (e.g. birthday, cat, neighbor, summer), that were either presented to participants in English in the English session or in Russian in the Russian session, the authors found that participants retrieved more memories of events that had taken place earlier in life in Russian, when the cue word presented to them was in Russian, than when the language of the cue word was in English, and vice versa. Thus, the language of the recall session together with the cue word led participants to retrieve memories that had occurred in the respective language. In another study with Russian-English bilinguals, Marian and Kaushanskaya (2004), found that participants expressed more intense emotion when the language at retrieval matched the language spoken at the time when the event took place. This finding provides further support for a language-dependent encoding, suggesting that not only cognitive components of autobiographical self-knowledge are encoded in the language in which an event took place, but the same seems to be true for the affective components of a personal memory.

Findings suggesting a language-dependent encoding and retrieval of bilinguals' autobiographical self-knowledge have been found in samples with Russian-English (Marian & Kaushanskaya, 2004; Marian & Neisser, 2000), Spanish-English (Schrauf & Rubin, 2000), Polish-Danish (Larsen, Schrauf, Fromholt, & Rubin, 2002), and Japanese-English bilinguals (Matsumoto & Stanny, 2006). Thus, the language-dependency effect showed not to be restricted to a specific combination of languages and supports the notion that self-knowledge is encoded language-dependently.

To conclude, research on bilinguals' autobiographical memory revealed that the retrieval of memories of past events is improved when the language at retrieval matches the language that has been used during their encoding but hampered when the languages of encoding and retrieval differ (see Schrauf & Durazo-Arvizu, 2006, for a review).

In summary, we note that research shows evidence for a language-dependent encoding and retrieval of both general information and autobiographical, i.e. self-related, information. As self-knowledge is generated in interaction with the social environment, we assume that the self-concept of people with everyday multiple language use who typically use their different languages in different contexts of everyday life (Grosjean, 2010) encompasses mental representations which are associated with different languages.

In the next sections, we introduce two models of self-representation, to be able to derive assumptions about the structure of a language-dependent self-concept and its functional consequences.

The Dynamic Accessibility of the Self

Model of the Dynamic Self

The model of the dynamic self (Hannover, 1997) emerged within the framework of the social cognition paradigm and developed assumptions about the multiple structure and the flexible processes of the self. In the following section, we will first take a look at the structural assumptions of the model.

Within the model of the dynamic self (Hannover, 1997), the self-concept is conceived as an associative network where self-knowledge contents are cognitively represented as nodes (Bower & Gilligan, 1979), which are more or less strongly interconnected. In general, Hannover (1997) assumes that self-knowledge contents pertaining to the same context are more closely linked to one another than self-knowledge contents pertaining to different contexts. Hence, the representation of the self consists of multiple context-specific substructures (Bower & Gilligan, 1979; Markus, 1977). Clusters of context-specific information about the self are referred to as self-constructs, and the totality of all self-constructs as the self-concept (Hannover, 1997).

In a broad sense, context refers to a person's different areas of life and experience. These may be locally defined contexts, e.g. *self at home*, as well as personal and social sources of self-relevant experience, e.g. *self as a mother*, or *self as female* (see also Hannover, 2000). Information derived from a certain context may be represented in subordinate clusters of information (Hannover, 1997), e.g. *self as a mother* and *self as a wife* within the family context.

As a person grows older, age-dependent changes cause that the self-concept develops into an elaborate and idiosyncratic representation of oneself: Due to accumulating experience within contexts and the exploration of new contexts, in combination with advances in cognitive

capacities, the number of self-constructs represented in the self-concept of a person increases (Harter, 1986; Montemayor & Eisen, 1977; Shavelson, Hubner, & Stanton, 1976).

To exemplify the assumptions about the structure of self-representation subsumed in the model of the dynamic self (Hannover, 1997), we refer to our initially presented example from the Introduction section. As Figure 2 shows, in a simplified illustration, the self-concept of our person involves several self-constructs representing information she has accumulated about herself in different contexts, e.g. *self as a professor, self as a mother, self as tolerant.* Within the home context, self-knowledge is represented in two subordinate self-constructs, *self as a mother* and *self as a partner*. Contents of self-knowledge pertaining to the same context, or self-construct respectively, are more strongly associated, e.g. *soft-hearted* and *caring*, than contents of self-knowledge pertaining to different contexts.

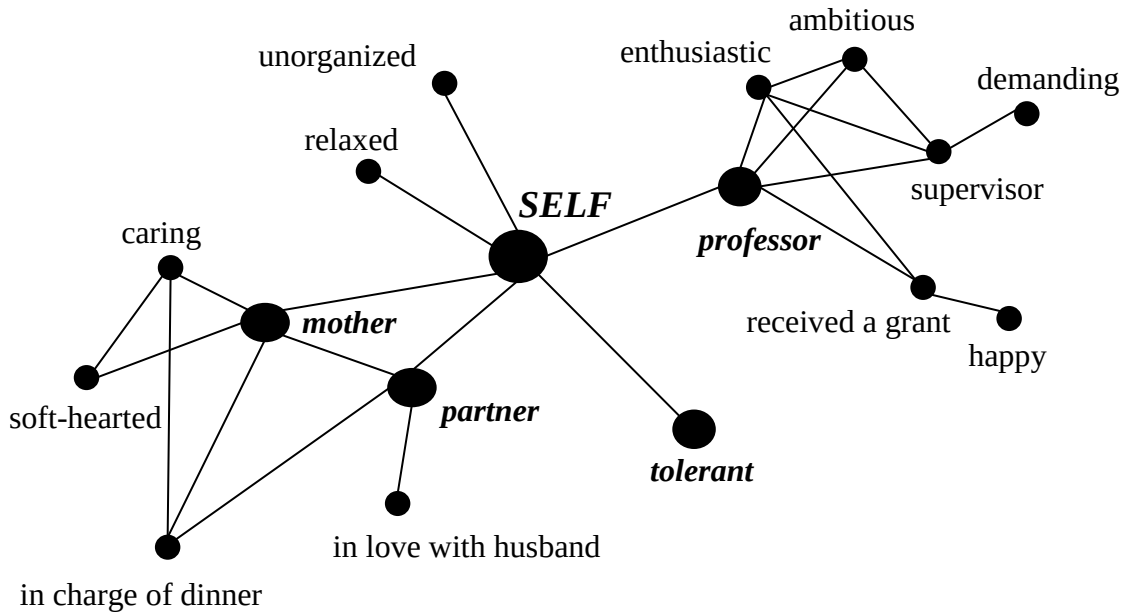

Figure 2 Model of the structure of the self-concept (adapted from Hannover, 1997)

So far, we have presented how self-knowledge is represented in the understanding of the model of the dynamic self (Hannover, 1997). In the following, we turn to assumptions made about the flexibility of the self.

According to the model of the dynamic self, it is assumed, that at any given time, only a configuration of information clusters is accessible. That means, in a specific situation, only self-knowledge is activated which is linked to the representation of the respective context. In line with the work of Markus and colleagues on self-schemata (Cantor, Markus, Niedenthal, & Nurius, 1986; Markus & Kunda, 1986), Hannover (1997) refers to the subset of self-knowledge clusters which are currently activated, as the *working self*. What is loaded into the working self depends on cues provided by the context. Activation can start from any individual self-knowledge content triggered by a cue (Hannover, 1997). Sources of activation can be external, in the form of contextual or situational cues, or internal, in the form of thoughts, motives, or belongings (e.g., Hannover, 2000).

Due to the more intense associations between self-knowledge contents pertaining to the same self-construct the spread of activation is foremost passed on to contents of self-knowledge belonging to the same self-construct, and to a lesser extent to contents associated with other self-constructs (Higgins, Rholes, & Jones, 1977).

Only self-knowledge which is loaded to the working self is accessible to the individual. Self-knowledge pertaining to other self-constructs, on the other hand, stays inactive and is not accessible (Hannover, 1997). Hence, the self is both stable and variable: As long as the same cluster of information is loaded to the working self, the self is stable; when the context changes, a different cluster of information is active, and the self, shows to be flexible (Hannover, 1997, p. 18).

To illustrate the procedural features of the self, let us again draw on our example: When cues in the environment, e.g. sitting in her office at university and a student knocking on the door, activate a specific self-knowledge content, e.g. *being a supervisor*, other self-knowledge contents represented in the cluster *self as a professor*, that are closely related are activated more easily, e.g. *being demanding*, than contents of self-knowledge that are less associated, e.g. *being happy about the grant*. Moreover, as only the self-knowledge contents pertaining to the self-construct *self as a professor* is loaded into the working self, self-constructs which are irrelevant in the given situation, e.g. *self as a mother*, and the associated self-knowledge contents, e.g. *being soft-hearted*, are not accessible. Only, if the situation changes, e.g. receiving a phone call from her sick son at home, the appropriate self-construct, *self as a mother*, will be loaded into the working self and replace the self-construct that was previously activated and consequently the appropriate self-knowledge is accessible, e.g. *being soft-hearted* and *caring*.

Since in a concrete situation only a specific cluster of self-knowledge contents associated with the self-construct of the specific context is activated, the dynamic of the self allows that a person's self-constructs contain contradictory self-knowledge without having them perceive any conflict (Hannover, 1997).

In several studies, Hannover (1994) empirically tested the assumptions about the multiple and flexible self which were anticipated by the theoretical model. Conducting experiments with participants who were from former East or West Germany, it was assumed that activating participants' group membership (East or West German) would load self-knowledge pertaining to the self as East or West German into the working self and impact on participants' spontaneous accessibility of self-knowledge which was assessed in different self-description tasks.

In one experiment (Study 1, Hannover, 1997), for instance, participants' group membership (East German or West German) was activated by the dialect the experimenter spoke. As expected, participants in the experimental group (whose group membership had been primed), showed to accept self-related information pertaining to the activated self-construct more often and faster than participants in the control group (whose group membership had not been primed). In another experiment (Study 2, Hannover, 1997), participants were randomly assigned to different writing tasks activating their group membership (East German or West German) or not. Analysis of the number of adjectives participants produced in a subsequent self-description task showed that participants whose group membership had not been activated produced more self-descriptive adjectives than participants whose group membership had been activated. This pattern was interpreted as an indication that participants without an activated self-construct accessed self-knowledge pertaining to different self-constructs, thus it was easier for them to retrieve self-knowledge and consequently to generate more self-related information, than for participants whose group membership had been primed who accessed information from their activated self-construct only and in consequence were more restricted (Hannover, 1997).

Taken together, research on the dynamic self suggests that the interaction of the clustered structure of self-concept representation and the privileged spread of activation within clusters of the self-concept implicate a context-dependent accessibility of self-knowledge, or as referred to by Hannover (1997) a dynamic self.

Based on our assumption that language affects encoding and retrieval of self-related information, we want to expand the assumptions on structure and processes of self-representation made by the model of the dynamic self with regard to the self of people with everyday multiple language use:

As people with everyday multiple language use typically use their different languages in different contexts (Grosjean, 2010), self-knowledge pertaining to a specific social context is typically acquired and used in a specific language. Therefore, we suggest that self-knowledge pertaining to the respective context is represented in the according language. Hence, within the self-concept of a person with everyday multiple language use, we assume that some self-constructs are represented predominantly in one language and other self-constructs are represented in another language. Based on the notion that the self of people with everyday multiple language use is represented in multiple, context-dependent, and language-dependent self-constructs, we assume that language as a situational cue in the environment triggers the activation of self-knowledge that is encoded in the same language.

Language as a situational cue

Our assumption receives support from findings that have been shown in a variation of the study conducted by Marian and Neisser (2000) on the access of autobiographical memory of Russian-English bilinguals reported earlier in this dissertation. Whereas in their study reported above (Experiment 1), cue words were presented in the same language as the session took place, i.e. the language the interviewer spoke to participants, in Experiment 2 the language in which the session took place was varied independently from the language of the cue words. The findings revealed that the language of the interview situation and the language of the cue contributed individually to the language-dependent recall of autobiographical memories. Indeed, the effect of the language of the interview situation was somewhat stronger than the effect of the language of the cue word. The authors concluded that language functions similar to other forms of contextual cues: “In general, information that is acquired in a certain linguistic ambiance is likely to become more accessible when recall takes place in

that same ambiance" (Marian & Neisser, 2000, p. 367). We interpret the findings from Marian and Neisser (2000) as evidence suggesting that language situation is even stronger for the activation of self-knowledge than conscious activation. As self-knowledge contents usually are activated automatically, i.e. without the person being aware (Hannover, 1997, p. 53), this interpretation is particularly interesting with regard to our assumptions about a language-dependent activation of self-constructs.

Cultural Frame Switching

For further evidence supporting our assumption that self-constructs are activated language-dependently, we draw on empirical findings from so-called cultural frame switching (CFS) studies. Using language as an experimental prime, these studies typically show that bilinguals present themselves in line with cultural norms that are associated with the respective language (Benet-Martínez et al., 2002; Chen & Bond, 2007, 2010; Trafimow, Silverman, Fan, & Law, 1997; Verkuyten & Pouliasi, 2002; Zou, Morris, & Benet-Martínez, 2008).

Wang, Shao, and Li (2010), for instance, conducted a study with English-Chinese bilingual children from Hong Kong between 8 and 14 years old. Participants were interviewed in either English or Chinese. The authors expected to find differences between participants' answers that are in line with self-views and values of the Western society when interviewed in English and self-views and values of the Eastern societies when interviewed in Chinese. As expected, children interviewed in English provided more self-focused self-descriptions and recalled more self-focused autobiographical memories than children interviewed in Chinese.

Furthermore, Western values were endorsed more strongly by children interviewed in English, compared with children interviewed in Chinese.

Similarly, in another study with Chinese-English speaking university students, Ross, Xun, and Wilson (2002) found that participants responding in Chinese described themselves using more collective self-descriptions and equal numbers of favorable and unfavorable statements whereas participants responding in English described themselves more individualistic, and reported more favorable statements. Moreover, participants assigned to responding in Chinese reported lower global self-esteem than participants assigned to responding in English. In line with the cultural frame switching idea, Ross and colleagues (2002) suggested "separate knowledge structures in bicultural individuals, with each structure activated by its associated language" (p. 1040).

The strength of the effect of language in activating culture-specific self-related knowledge has even been shown in variations of personality traits - though personality is usually regarded a stable characteristic (McCrae & Costa, 1994). Ramírez-Esparza, Gosling, Benet-Martínez, Potter, and Pennebaker (2006) examined whether English-Spanish bilinguals show differences on the Big Five dimensions of personality when either asked in English or in Spanish. On three of five dimensions, they found significant differences between participants who were asked in English and who were asked in Spanish in a way that was consistent with personality differences that have been found between English- and Spanish-speaking cultures.

Participants in studies on cultural frame switching are typically bilinguals who are considered bicultural, i.e. bilinguals whose different languages are linked to different cultures. With few exceptions (e.g., Ramírez-Esparza et al., 2006; Verkuyten & Pouliasi, 2002), participants typically are Chinese-English bilinguals supposedly socialized with the collectivistic values of the Eastern society and the individualistic values of the Western society (cf. Markus &

Kitayama, 1991). On the one hand, it has been argued that findings on cultural frame switching apply to bicultural bilinguals only (Luna, Ringberg, & Peracchio, 2008). On the other hand, Benet-Martínez and colleagues (2002) argue that "biculturalism is not a phenomenon that is relevant only to immigrants or people with multiple ethnic identities" (p. 512). Instead, they propose, that monoculturals may also switch between different mental frames that are linked to their "multiple, opposing identities across dimensions other than culture" (Benet-Martínez et al., 2002, p. 512).

Translated into our theoretical terms, what Benet-Martínez and colleagues (2002) suggest is that the various social contexts individuals interact in, to some extent, also involve different cultures, for example in terms of context-specific demands, and sometimes even are opposing sources for the self. This is also in line with the notion that the self-concept might include opposing self-knowledge contents pertaining to a person's different self-constructs (Hannover, 1997, p. 18). Multiple self-constructs thus in some sense function like different mental frames and the context-dependent activation of self-constructs and increased accessibility of self-knowledge that is in line with the respective context and its demands is similar to the mechanism shown in CFS studies with respect to self-involved knowledge.

Applied to our notion of a language-dependent self-representation, language may additionally serve as a frame and trigger the activation of self-constructs and thus increase the accessibility of self-knowledge associated with the respective language while decreasing the accessibility of self-knowledge associated with a different language.

Taken together, evidence from studies on cultural frame switching suggests that language facilitates the activation of mental constructs that are linked to the use of the respective language. This supports our assumption of a language-dependent self-representation and language-dependent accessibility of self-knowledge in people with everyday multiple language use which should become evident regarding self-description and self-esteem.

In this dissertation, we further seek to investigate whether a language-dependent self-representation has effects for emotion and motivation. In the following section, we present the self-complexity model (Linville, 1985, 1987), which enables us to derive appropriate assumptions.

The Complexity of the Self

The Self-Complexity Model

The self-complexity model is a much-researched model on self-representation and goes back to the work by Linville (1985, 1987). In the following, we first look at the basic assumptions about the representation of the self. Afterward, we take a look at empirical research findings that show the effects of self-complexity on psychological processes, such as emotion and motivation. Subsequently, we will derive our assumptions about the self of people with everyday multiple language use.

Having observed that people differ substantially in how extreme their affective responses to positive or negative life events are, Linville (1985) introduced the self-complexity model initially relating the structure of self-representation to self-esteem stability. The following section consecutively considers the assumptions of the self-complexity model.

In line with the social cognition perspective on the self, the self-complexity model is based on the assumption that the self is a cognitive structure represented in terms of multiple aspects (*Assumption 1*). Different self-aspects are likely to represent the different social contexts in which a person is regularly interacting, thus reflecting a person's different roles or different interpersonal relations. Self-knowledge associated with the different self-aspects of a person

may include information about specific events and concrete behavior, as well as abstract self-knowledge in the form of traits. Especially generalizations about the self that extend across different social contexts render possible that various self-aspects may share the same self-relevant information (Linville, 1985).

Second, the self-complexity model postulates that self-aspects are associated with affect and self-esteem. Emotional states are encoded when information about the self is processed, accordingly contents of self-knowledge contain affective components, being either positive or negative, and most likely, each of a person's self-aspects is associated with a mixture of more or less positively or negatively connoted self-knowledge. As a consequence the affect associated with each self-aspect differs (*Assumption 2*). As Linville (1985) argues, the differences in affect associated with a person's self-aspects become observable in the variation of affect and emotion a person shows across time. For instance, when the self-aspect of oneself as an athlete is activated a person may feel good and show pride about himself or herself whereas when the self-aspect as a partner is activated the same person may feel bad and embarrassed about a recent failure (Linville, 1985).

Third, it is postulated that people differ in the complexity of their self-representation (*Assumption 3*). Linville defines self-complexity as the function of the number of self-aspects and the degree to which the self-aspects are interrelated. A self-representation consisting of fewer self-aspects and showing lot of redundancy among self-aspects is characteristic of relatively low self-complexity. Using many self-aspects to organize self-knowledge with no or little redundancy characterizes higher self-complexity (see Linville, 1985).

As a fourth basic assumption, Linville expected that those low in self-complexity experience more variation in self-esteem than those high in self-complexity (*Assumption 4*). On the one hand, when having a self-representation consisting of only a small number of self-aspects, an event that influences the evaluation of a single relevant self-aspect will have more impact on overall self-esteem because a single self-aspect carries more weight than when a person has a larger number of self-aspects (and one self-aspect is only a small proportion of the person's self-concept). On the other hand, when self-knowledge is represented in highly redundant self-aspects, an event that influences the evaluation of a single self-aspect will impact other closely related self-aspects and, in effect, a larger proportion of the self and, consequently, overall self-esteem will be influenced. People high in self-complexity, on the other hand, are expected to have a more stable self-esteem because the impact of an event is localized to the single relevant self-aspect and does not spill over to other (unrelated) self-aspects (Linville, 1985). In Table 1, the basic assumptions of the self-complexity model are summarized.

Table 1 Overview of the basic assumptions of the self-complexity model (Linville, 1985)

1. The self is cognitively represented in terms of multiple aspects.
2. Self-aspects vary in the affect associated with them.
3. People differ in the degree of complexity of their self-representation.
4. Overall affect and self-appraisal are a function of the affect and self-appraisal associated with different aspects of the self.

In order to illustrate the research paradigm Linville chose to test the assumptions of the self-complexity model, in the following section, we outline the procedure of her first empirical study (Experiment 1; Linville, 1985). It was expected that following negative performance feedback, participants lower in self-complexity would show more negative affect and self-evaluation than participants higher in self-complexity. Following positive performance

feedback, participants lower in self-complexity, were expected to show more positive affect and self-evaluation than participants higher in self-complexity.

First, fifty-nine male undergraduate students participating to fulfill their course requirements worked on a self-descriptive card sorting task developed by Linville (1985, 1987) to assess self-complexity. Participants were given a deck of thirty-three randomly ordered cards with each card containing a positive (e.g., soft-hearted) or negative (e.g., unorganized) trait adjective. Participants' task then was to think about themselves and to sort traits they felt to be descriptive of themselves into groups, where each group represented a different aspect of themselves. Participants were free to sort traits on any meaningful basis, as long as they kept in mind that they were supposed to describe themselves. Participants were free to create as many groups as they wanted until they felt that all important ones had been formed. It was possible to set traits aside if participants felt that the trait was not descriptive of themselves and they were allowed to use the same trait for different groups. Finally, participants were instructed to record their sorting result on a recording sheet where they had the possibility to provide descriptive labels for each group. Table 2 displays an example of a recording sheet from Linville's initial study (1985) where the participant sorted traits into five groups supposedly reflecting different self-aspects[2].

[2] In the whole sample of fifty-nine male participants the actual range of self-aspects varied between 3 and 21 (M = 6.83, SD = 3.59).

Table 2 Example of one participant's trait sorting result from Linville (1985)

CREATIVE	ALONE	WITH FRIENDS	REAL-WORLD SURVIVAL	BAD TRAITS
Industrious	Relaxed	Relaxed	Outgoing	Lazy
Reflective	Reflective	Playful	Rebellious	Impulsive
Imaginative	Quiet	Soft-hearted	Assertive	Unorganized
Individualistic		Affectionate	Mature	Not studious
Humorous		Humorous	Competitive	
Unconventional				

Being interested in the complexity of the self, which was operationalized as a function of the number of self-aspects and the redundancy of traits among self-aspects, a self-complexity score was calculated for each participant based on their recording sheets. Linville introduced the *H* statistic—a measure of dispersion derived from information theory (Attneave, 1959; Scott, 1969)—as the procedure to obtain a compound measure for self-complexity (*SC*). The *SC* score is calculated using the following formula:

$$SC = log_2 n - (\sum_i n_i log_2 n_i)/n$$

where n is the total number of traits available in the sorting task (n = 33) and n_i is the number of traits appearing in every possible group combination (see Appendix for a detailed explanation of the calculation procedure). Using 33 trait cards, the resulting self-complexity score can potentially range between 0 and $\log_2$ 33 = 5.04, with higher scores indicating greater self-complexity and lower scores indicating a less complex organization of self-knowledge[3].

[3] The range of actual scores in the sample of Linville's initial study (1985) was between 1.42 and 4.92 (M = 2.86, SD = .76).

After finishing the trait sorting task, participants continued working on a questionnaire presented at the computer including affect and self-evaluation items (e.g. “At this moment, to what degree do you feel …”) with the endpoints of the scale being ‘not at all’ and ‘extremely’. Subsequently, participants worked on a task supposedly measuring analytical abilities related to aspects of their intelligence. Participants were randomly assigned to bogus feedback telling half of the participants that their performance was in the bottom 10% and the other half that their performance was in the top 10% of those taking the test. The experiment furthermore included the simulation of a breakdown of the computer allegedly causing that participants’ answers on the affect and self-evaluation items had been lost and participants were asked to work on the affect and self-evaluation items once again emphasizing that items should be completed in terms of how they felt right at the moment.

With respect to her basic hypothesis, that self-complexity would moderate affective extremity, statistical analysis revealed a significant effect of self-complexity following negative feedback: As hypothesized, those low in self-complexity (based on median split) showed lower scores on both measures, affect and self-evaluation, than those high in self-complexity, while controlling for differences at Time 1. Furthermore, using the self-complexity scores as a continuous variable in a multiple regression analysis in which scores at Time 2 were modeled as a function of self-complexity and scores at Time 1, showed the expected positive moderating effect of self-complexity for participants in the failure condition.

For participants in the success condition, both statistical models indicated that the effect of self-complexity was in the predicted direction, however, the effects were weak and not significant (Linville, 1985). Only conducting a replication of the success condition with a more powerful success manipulation (participants were told that they scored in the top 5% of Yale undergraduates in a task measuring analytical ability which correlated highly with intelligence) showed the expected difference between participants low in self-complexity and

those high in self-complexity (dichotomized using median split), and the negative moderating effect of self-complexity on affect at Time 2.

In a further study, conducted by Linville (1985), analysis of diaries of individuals low in self-complexity showed a greater variance of feelings in the entries over a two-week period than of individuals high in self-complexity.

In a third study, Linville (1987) tested the effect of self-complexity applied to stress-related vulnerability. A sample of 106 participants (43 male and 63 female) completed the trait sorting task, as well as scales capturing stressful events, depression and physical symptoms in two sessions two weeks apart. Analysis of the recording sheets revealed that participants formed between 3 and 12 self-aspects (M = 6.57, SD = 2.16) and self-complexity scores ranged between .99 and 4.80 (M = 3.09, SD = .70). Preliminary analysis furthermore revealed, that there was no significant difference in self-complexity scores between male and female participants, and scores were relatively stable from Time 1 to Time 2 (r = .70, p < .001). Correlational analysis supported the spill-over hypothesis: The higher the level of self-complexity, the weaker was the impact of stressful life events on depression and physical symptoms. Linville (1987) interpreted the findings as support for the self-complexity model in which self-complexity functions as a cognitive buffer preventing spill-over processes.

In summary, the empirical findings presented in the studies Linville (1985, 1987) undertook in order to empirically test the theoretical assumptions of the self-complexity model support the notion that the representation of self-knowledge moderates the impact of emotional events, with high self-complexity being beneficial for the individual. However, before we derive our assumptions about the moderating effect of language-dependent self-representation on emotion, in the following section, we briefly review research on self-complexity conducted by others than Linville herself.

The self-complexity model has received a lot of attention (see Rafaeli & Hiller, 2010). In numerous research designs, the concept of self-complexity has broadly been employed in investigating its relation to a wide variety of measures concerning well-being – with mixed results (see Pilarska & Suchańska, 2015, for a review).

A meta-analysis conducted by Rafaeli-Mor and Steinberg (2002) including 70 studies on self-complexity (involving negative manipulation, positive manipulation or neither) overall revealed only weak effect sizes (r = .03, r = -.27, and r = -.04, respectively). Considering only studies including negative or stress manipulation, which was supposed to be the most appropriate test of the self-complexity model, Rafaeli-Mor and Steinberg (2002) took a further approach in which they analyzed altogether 24 studies, all of which included a negative or stress manipulation. As a matter of fact, the analysis showed only limited support for the buffering hypothesis when applied to other outcomes than participants' level of depression, mood or self-esteem. The mixed pattern of results has caused that the self-complexity model has been severely questioned (Koch & Shepperd, 2004; Rafaeli & Hiller, 2010; Rafaeli-Mor & Steinberg, 2002). Several researchers have argued that mixed results could be reduced to the fact that the material with which self-complexity has been assessed varied from study to study, e.g. differences in the number of traits cards and the valence of traits presented on the cards (e.g., Morgan & Janoff-Bulman, 1994). However, it seems that the buffering effect cannot be expected regarding any measure concerning well-being without restrictions.

Nevertheless, a study by Dixon and Baumeister (1991) found an interesting link between participants' self-complexity and their coping styles. The experiment measured participants escape from a self-focusing situation after having received positive or negative feedback. It was expected that following failure feedback, participants' tendency to escape from self-awareness is moderated by their self-complexity, with stronger tendencies among people low

in self-complexity than among people high in self-complexity. Furthermore, it was hypothesized that participants low in self-complexity perform more poorly in a subsequent task than participants high in self-complexity. Analysis revealed that, as expected, participants who had experienced failure and who were low in self-complexity showed the strongest tendency to avoid self-awareness and performed more poorly in an essay writing task. Dixon and Baumeister (1991) concluded that people low in self-complexity cope with failure by withdrawing effort from self-relevant tasks while people high in self-complexity are likely to show more personal effort in response to failure.

From a methodological perspective, it has furthermore been suggested that the *H* statistic as a measure for self-complexity is problematic (Locke, 2003; Rafaeli-Mor, Gotlib, & Revelle, 1999). Instead of using the *H* statistic, it has been proposed to distinguish between the two components that have originally been proposed by Linville as determining self-complexity: 1) the number of self-aspects, and 2) the degree of overlap. Using two structural measures displayed more robust internal consistency, even when the valence of traits was variegated, and more convergent validity of the self-complexity model (Rafaeli-Mor et al., 1999).

To summarize, in this section we have reviewed literature that calls the self-complexity model into question. However, we come to the conclusion that the assumptions made by the self-complexity model keep their validity if self-complexity is statistically represented by two separate measures, the number of self-aspects and the overlap between self-aspects.

The Multiple Self-Aspects Framework

In recent years, McConnell and colleagues have extensively dealt with the self-complexity model, both in theory within the Multiple Self-Aspects Framework (Brown & McConnell, 2009; McConnell, Strain, Brown, & Rydell, 2009; McConnell, 2011; McConnell, Brown, &

Shoda, 2013; McConnell, Rydell, & Brown, 2009; McConnell et al., 2012; McConnell & Strain, 2007; Schleicher & McConnell, 2005) and in practice conducting research aiming to provide support for the assumptions made by the self-complexity model. As an example, hereinafter, we illustrate a series of experiments conducted by McConnell, Rydell, and Brown (2009) in which they set out to explore the spill over hypotheses in more detail.

In Session 1 of their experiment, college students worked on a computerized version of the self-description task including 20 positive and 20 negative traits. After participants completed the self-description task, they rated each of their self-aspects regarding the positivity on a scale ranging from 1 (very negative) to 7 (very positive) and completed a mood measure to provide baseline measures of general affect. Sixty participants who had generated a student self-aspect or a dating self-aspect (targeted self-aspect) were selected for participation in Experiment 1. Fifty-nine participants who had described at least one of their self-aspect using the trait intelligent or outgoing (targeted trait) were recruited for Experiment 2. Both experiments intended to assess spill over processes. In the first experiment, Session 2 involved that participants' self-esteem was manipulated receiving bogus feedback about the targeted self-aspect (i.e. either their student self or their dating self). Allegedly based on their responses in a personality test, they received either positive feedback ("...you are in the top 10%...") or negative feedback ("…you are in the bottom 10% in terms of having success in college / fulfilling romantic relationships") based on random assignment. After the feedback, participants rated the positivity of each self-aspect that they had created in the trait sorting task in Session 1 and completed the same mood scale as in Session 1 to assess the variation post manipulation. Analysis revealed that those lower in self-complexity showed stronger mood shifts consistent with the direction of the feedback than those greater in self-complexity. More importantly, however, analyzing the variation in the positivity of non-targeted self-aspects McConnell and colleagues (2009) found that evaluations of non-targeted

self-aspects changed after receiving feedback about the targeted self-aspect as a function of the extent to which the non-targeted self-aspect shared attributes with the targeted self-aspect. Non-targeted self-aspects which had greater attribute overlap with the targeted self-aspect were impacted to a stronger degree than non-targeted self-aspects with little or no attribute overlap. Hence, it was demonstrated by Experiment 1 that for those lower in self-complexity, spill over occurs because self-relevant feedback impacts evaluations of other self-aspects when they share attributes with the targeted self-aspect.

In Experiment 2, participants received feedback about the targeted trait instead of feedback on a targeted self-aspect ("…your responses indicated that you are in the top 10% [bottom 10%] of college students in terms of intelligence/outgoingness"). Analyzing the variation in participants' mood, McConnell and colleagues found that the impact of attribute feedback on general affect had been stronger when the attribute was associated with a greater number of self-aspects than when it was associated with a smaller number of self-aspects.

In summary, the work by McConnell and colleagues lends support for the hypothesis that people low in self-complexity are more affected by external events because of the affective spill over that occurs when self-aspects share associated attributes.

In this dissertation, we want to extend the self-complexity model by adding our notion of a language-dependent organization of self-aspects. In the following, we present our assumption that language can serve as a third dimension, additionally hampering the spill over of negative affect in language-dependent self-representation.

Applying the assumptions of the self-complexity model to our notion that everyday multiple language use influences self-representation in that self-knowledge is linked to the language in which it has typically been acquired and used, we want to put forward the notion that the self

of people with everyday multiple language use can be assumed to be organized in a more complex manner, in terms of compartmentalized along language lines.

Self-complexity has been defined as a function of the number of self-aspects and the relatedness among self-aspects. Whereas regarding the first feature determining self-complexity, i.e. number of self-aspects, there is no reason to assume that everyday multiple language use impacts on the number of self-aspects, there is good reason to assume that everyday multiple language use impacts the second structural feature involved in self-complexity, i.e. the relatedness among self-aspects. Let us address this assumption in an example: If a person with everyday multiple language use who is typically using one language when with friends but another language when at work acquires similar information about him/herself with respect to those two social contexts, e.g. being trustworthy as a friend and being trustworthy as an employee, he or she likely incorporates being trustworthy as an abstract content of self-knowledge both into the self-aspect *me as a friend* and the self-aspect *me at work*. However, because the person uses different languages in the respective contexts this self-knowledge content is expected to be represented in different languages regarding the two self-aspects. In this respect, everyday multiple language use would offer an additional dimension to organizing self-knowledge in a more complex manner by minimizing redundancy between self-aspects. Drawing on the spill-over hypothesis, we assume that for people with everyday multiple language use a language-dependent representation of self-knowledge hampers the spill-over of affect from one self-aspect to other self-aspects, thus we assume that a language-dependent organization of self-knowledge moderates the stability of self-esteem.

The notion of self-compartmentalization has been introduced by Showers (1992) proposing that categorical organization of self-knowledge into separate, uniformly valenced self-aspects would explain peoples' variation in depression and self-esteem over time. Showers (1992)

expected that as long as positive self-aspects are activated, participants' affective state is high because access to self-aspects containing negative information is minimized. Drawing on this notion, we assume that compartmentalization along language lines which is characterized by self-aspects being differentiated regarding the language of the associated self-knowledge minimizes access to self-knowledge in one language as long as self-knowledge pertaining to another language is activated.

In summary, based on our assumption of a language-dependent self-representation, we assume that for people with everyday multiple language use self-knowledge pertaining to different self-aspects is additionally differentiated by the language of its representation. In consequence, we expect overlap between self-aspects to be less likely. In line with the self-complexity model, what should be expected is that the spill-over of negative affect among self-aspects is less likely to occur for people with everyday multiple language use, to the extent that their language-dependent self-representation acts as an additional dimension of self-complexity.

Taken together, as a result of this section we come to the conclusion that people differ in the complexity in which they represent their self-knowledge which has been shown to moderate the impact of self-threatening experiences on overall affect. As people with everyday multiple language use typically use different languages depending on the context their self can be expected to be organized more complex in terms of using language as an additional dimension resulting in a manner which we refer to as compartmentalized along language lines. As a consequence of having a language-dependent self-representation that is highly compartmentalized along language lines, we expect positive outcomes regarding self-esteem stability in people with everyday multiple language use.

Summary of the Theoretical Assumptions

To conclude with the theoretical part of this dissertation, in this section, we briefly review our notion of the self and summarize our assumptions about a language-dependent self-representation arising from everyday multiple language use and its positive emotional and motivational consequences.

Our understanding of the self is based on the social cognition perspective: We comprehend the self as a complex memory structure encompassing the mental representations of self-involved information people generate in interaction with their social environment throughout their lifespan. Self-knowledge is represented in a semantic network in memory, the so-called self-concept, and organized in multiple clusters pertaining to different social contexts, so-called self-aspects.

Different models on the self which emerged in the realm of the social cognition paradigm have addressed the structure of the self-concept and its consequences: The structure of self-concept moderates the spread of activation, thus self-representation is relevant for a context-dependent accessibility of self-knowledge (Hannover, 1997) and moderates the spill-over of affect (Linville, 1985, 1987).

However, in our view, these models have neglected what is a fact for millions of people: Social interactions take place, and self-knowledge is generated while using different languages. Based on existing literature, we have derived assumptions about a language-dependent self-representation in individuals with everyday multiple language use. Beyond the scope of the existing literature, we want to address the effects of everyday multiple language use on the self and propose that a language-dependent self-representation has corresponding effects on the activation of self-knowledge.

As for people who use multiple languages in their everyday life the interaction with the social environment takes place in different languages, we suggest that their self encompasses self-knowledge that is encoded in different languages. More specifically, as people who use multiple languages in everyday life typically use their different languages depending on the social context (Grosjean, 2010), self-aspects should be predominantly represented in the language typically spoken in the respective social context. As a consequence, we assume that self-knowledge pertaining to a specific social context is more readily accessible if the language of retrieval matches the language of encoding.

Furthermore, we propose that a language-dependent self-representation adds to the complexity of the self. We assume that due to the fact that different self-aspects are associated with self-knowledge pertaining to different languages, the self-representation of people with everyday multiple language use can be considered to be more complex in terms of showing less overlap among self-aspects. Consequently, the spill over of negative effect is less likely to occur. If so, we assume that this should be reflected in the fact, that people with everyday multiple language use profit from the extent of using language as an additional dimension for the organization of self-knowledge, i.e. compartmentalized along language lines, regarding the stability of self-esteem and level of motivation.

In the following, we attempt to integrate our assumptions into a theoretical model on language-dependent self-representation, which we visualize with the help of a schematic illustration of a self-concept. To this end, we again draw on the self-concept of the person from our example in the introductory section (see Figure 3).

The presented self-concept[4] comprises altogether five self-aspects (ovals) pertaining to different social contexts in which the person is regularly interacting. For purposes of better explaining our assumptions on the impact of everyday multiple language use on self-representation the self-concept has been expanded by two self-aspects pertaining to contexts in which the person is interacting using both of her languages. Furthermore, for reasons of clarity the associated self-knowledge is on attribute level. In the family context, the person uses another language than in the university context. When interacting with neighbors the person's language use is dependent on the interaction partner and the language they speak. In the sports context, the person uses her languages interchangeably. Each self-aspect is associated with a number of attributes (rectangles). Whereas the attributes *intelligent*, *creative*, *driven* are uniquely associated with the "*self as a professor*", the self-aspects "*self as an athlete*" and "*self as a neighbor*" for instance share the attribute "*competitive*" and the self-aspects "*self as a mother*" and "*self as a wife*" are rather redundant as they share several attributes.

Based on the assumption that self-knowledge is encoded and represented language-dependently, we assume that self-knowledge pertaining to the *self as professor* is represented in another language than self-knowledge pertaining to the *self as mother* or *self as a neighbor*. Due to their more frequent joint activation, self-knowledge contents represented in the same language are more closely connected than self-knowledge contents represented in different languages. Hence, the self-knowledge of a person with everyday multiple language use is represented not only in context-dependent but also in different language-dependent substructures.

[4] The presented self-concept is adapted from McConnell, Shoda, and Skulborstad (2012)

Based on the assumption that the flexibility and dynamic of the self is caused by situational cues activating a specific self-knowledge content, such as the context of a situation (Hannover, 1997), we assume that language as a situational cue additionally activates self-knowledge which is encoded in the respective language. As a consequence of the closer links among self-knowledge which is represented in the same language, activation is foremost passed on among self-knowledge contents represented in the same language. This means we assume that being in the language ambiance of the university renders unlikely that self-knowledge pertaining to the self-aspect, e.g. *self as mother*, which is associated with the use of another language is activated.

Furthermore, we understand a self-concept which is represented language-dependently to be more complex. We suggest, that the language that is associated with self-knowledge pertaining to a specific self-aspect can be considered as an additional dimension in organizing of self-knowledge in a complex manner.

Based on Linville's assumption that self-knowledge contains evaluative information and self-esteem in any given situation reflects the evaluation of the currently activated self-knowledge contents which are loaded into the working self, we assume that being in the language situation of the university context self-esteem is mostly fed by self-knowledge which is represented in the same language.

While some self-aspects might be represented in one language only, others might be related to contexts where the person regularly uses different languages. To exemplify this matter, we extend our introductory example for a self-aspect pertaining to self as an athlete who is in a team where she can use both of her languages interchangeably. Hence, self-knowledge pertaining to the *self as an athlete* is represented in the person's different languages.

To the extent that self-aspects represent self-knowledge that is encoded in different languages, we assume that the spread of activation is passed on to self-knowledge within the same self-aspect but in another language.

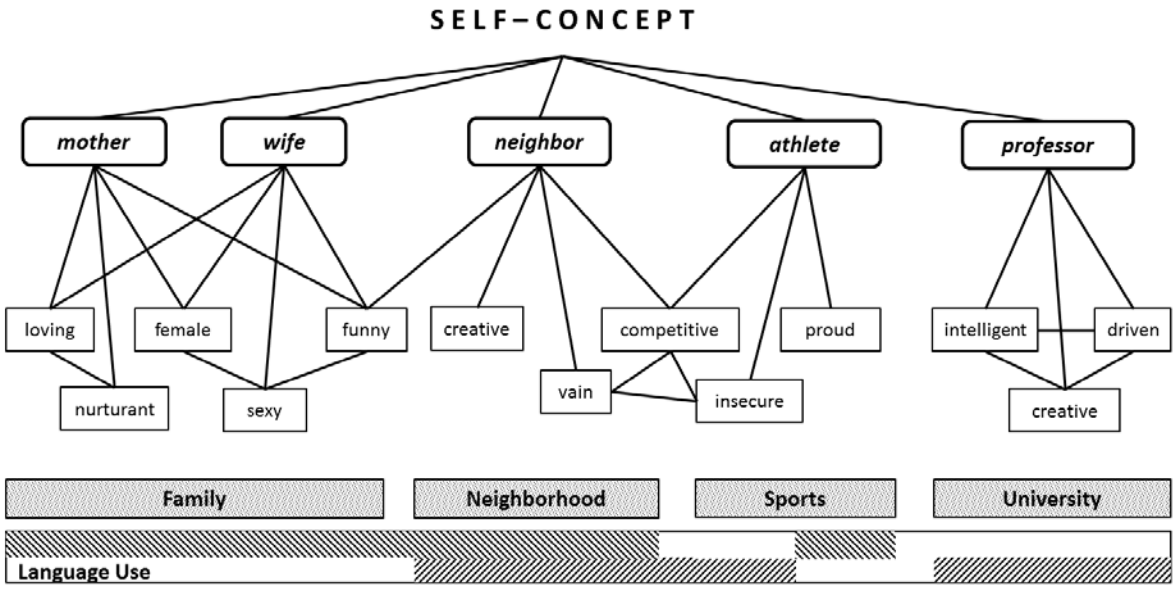

Figure 3 Model of language-dependent self-representation

Overview of the Empirical Studies of the Dissertation

The aim of the present dissertation is to examine the self of people with everyday multiple language use. In the preceding chapters, we have presented the theoretical background and empirical foundations on which we base our assumptions regarding the impact of everyday multiple language use on the self. In the previous section, our assumptions have been summarized and demonstrated in the model on language-dependent self-representation. In this section, we provide an overview of the empirical studies conducted for this dissertation. Stating the respective research objectives and hypotheses of the studies it will be clarified which of our assumptions are empirically examined in what study.

In Study 1, we test our assumption that self-knowledge associated with a specific context is represented in the language that is typically spoken in the respective context. More specifically, we investigate the accessibility of context-bound self-knowledge in immigrant bilingual students who are using the language of instruction at school only and immigrant bilingual students using the language of instruction also when at home. Analyzing open self-descriptions which students provided at school in the language of instruction at school, we expect students who use German when at school only to access more school-related self-knowledge than students who are using German also when at home. Contrary, we expect students who use German only when at school to access fewer home-related self-knowledge contents than students who use German also when at home.

In Study 2, we test our assumption about a language-dependent self-representation regarding the accessibility on affective self-knowledge. More specifically, we examine whether different self-aspects are more distinct sources of self-esteem when the respective social contexts pertaining to these self-aspects differ regarding the language that is typically used

than when the respective social contexts share the same language. Again, considering school and home as two meaningful social contexts and differentiating between bilingual immigrant students who use German when at school only and students who use German also when at home, for the former group of students, we expect the school and family self-aspects to be more distinct sources of global self-esteem than for the later where the school and the family self-aspect are more integrated sources of global self-esteem.

In Study 3, we introduce a newly developed method to examine our assumptions about a language-dependent self-representation in people with everyday multiple language use. In a bilingual version of the trait sorting task initially developed by Linville (1985) to assess self-complexity, bilingual students described different aspects of themselves using traits that were presented in both of their languages. We analyze the trait sorting results and introduce novel measures that assess the extent to which participants use language as an organizing principle in self-representation, i.e. compartmentalize along language lines.

In Study 4, we test our assumption that a language-dependent self-representation serves as a cognitive buffer against self-threatening feedback. More specifically, we examine whether the extent to which participants' self is compartmentalized along language lines moderates the spill over of negative affect when receiving self-threatening feedback. We expect that for participants who compartmentalize along language lines to a stronger extent variation in self-esteem is smaller after receiving the negative feedback than for participants who do not use language as an organizing principle or only to a lesser extent.

In Study 5, we address our assumption about positive emotional and motivational consequences of a language-dependent self-representation. In an online based experiment, participants using multiple languages in their everyday life were randomly assigned to an open self-description task in which they had to describe themselves in either the same language or the other after having received bogus feedback. Whereas we do not expect

differences between participants within the positive feedback condition, within the negative feedback condition, we expect that participants who used the other language for their self-description to encounter a buffering effect and in consequence show higher levels of self-esteem and more motivation regarding a further feedback situation.

To summarize, conducting five empirical studies with different research approaches, in this dissertation, we aim to provide empirical evidence for a language-dependent self-representation and show its positive emotional and motivational consequences. Doing so, we aim to contribute to a resource-oriented perspective on everyday multiple language use.

In the following, we present the studies of this dissertation. Each study is introduced briefly stating the aim of the study and the research hypothesis and followed by the study's methods, results, a summary and discussion of the results. In the subsequent chapter, the key findings of the present work are summarized and discussed.

DISSERTATION STUDIES

Study 1. How immigrant students' self-views at school relate to different patterns of first and second language use[5]

The main aim of Study 1 is to examine our assumption about a language-dependent self-representation resulting from everyday multiple language use. Based on the assumption that the language that is typically used in a specific social context impacts on the representation of the respective self-knowledge, we expect to find differences in the spontaneous accessibility of context-dependent self-knowledge as an effect of how people with everyday multiple language use distribute their languages across different social contexts, i.e. their language use pattern. More specifically, we expect that context-bound self-knowledge is more readily accessible when the language at retrieval matches the language at encoding than when they mismatch.

Study 1 is based on the analysis of data collected as part of a larger school study that focused on migration and education in Germany (Hannover et al., 2013). The sample comprised a considerable number of students with an immigrant background who use

[5] This study has been published in co-authorship of Ute Gabriel, Nanine Lilla, Lysann Zander, and Bettina Hannover. The Methods and Results section of Study 1 presented in this dissertation correspond to the post-print of the published version:

Gabriel, U., Lilla, N., Zander, L., & Hannover, B. (2014). How immigrant students' self-views at school relate to different patterns of first and second language use. *Social Psychology of Education*, *17*(4), 617–636. https://doi.org/10.1007/s11218-014-9268-4

multiple languages in everyday life and the available data allowed identifying different language use patterns: Bilingual immigrant students who use German only when at school were categorized as having a *separate language use pattern (S-LUP)* and bilingual immigrant students who use German also when at home were categorized as having a *fused language use pattern (F-LUP)*. Open self-descriptions students had provided in German while at school were content-analyzed with focus on statements that are context specific, either pertaining to the *self at school* or the *self at home*. Our intension was to investigate the impact of language use pattern on the frequency with which students produced school- and home-related contents of self-knowledge in the language context of the school.

Based on the notion that the self is represented in multiple self-aspects that are activated depending on the context (Hannover, 1997; Markus, 1977), school-related self-knowledge should be more easily accessible than home-related self-knowledge when at school. Moreover, based on our assumption that self-knowledge is represented in the language in which it has typically been acquired, access on school-related self-knowledge should be additionally at ease for immigrant bilingual students who use German only when at school but not for immigrant bilingual students who use German also when at home.

We predicted that S-LUP students who use German only when at school would produce more school-related self-knowledge than F-LUP students who use German also when at home. Furthermore, for S-LUP students who use German only when at school home-related self-knowledge should be less accessible than for F-LUP students who use German also when at home. Hence, we predicted that S-LUP students would produce less home-related statements than F-LUP students.

Method

To test our hypotheses we analysed data selected from a larger nation-wide study that focused on migration and education in Germany (Hannover et al., 2013). Data were collected in two periods ($N_{period1}$ = 813; $N_{period2}$ = 1039) in seven Federal States of Western Germany from 105 ninth-grade classrooms in 44 schools (N = 1,852) with German as the language of instruction. Data were collected during two regular school hours. The survey consisted of standardized performance tests and a self-administered questionnaire, covering (among other psychological variables) the two self-description tasks and ending with demographic variables. To motivate participants we informed them beforehand that their names would be included in a lottery, the first prize being an iPod. Data from 4.64% of the students were excluded from the analyses due to missing information on demographics.

Sample

Only students who did not have German as their first language and who had answered questions on *language spoken with their mother/their father* were selected for our analyses. The selected sample consisted of 639 adolescents between 14 and 19 years of age (M = 15.5, SD = 1, $N_{period1}$ = 449, $N_{period2}$ = 190), the proportion of girls being slightly higher (49.3%) than that of boys (43.3%; 7.4% did not indicate their sex).

The secondary school system in Germany provides selective tracks of which *Gymnasium* is the highest, allowing students to proceed directly to higher education after graduation. In the sample 227 (35.5%) students attended a Gymnasium.

The major immigrant groups represented in the sample were from Turkey (38.6%) and European countries, mainly the former Yugoslavia (6.0%), Italy (4.8%), and Greece (3.1%).

Measures

The following measures, presented in the same order as in the survey, were used for our analyses.

German reading comprehension. To control for students' proficiency in their second language, 15 items from the standardized reading literacy test of the Programme for International Student Assessment (OECD (Organisation for Economic Co-operation and Development), 2002) with a focus on reading comprehension were assessed. The test was subdivided into five units, each presenting a text passage of about one page in length followed by several open format and single choice tasks. Participants had 20 minutes to complete the test sheet. Test scores corresponded to the sum of correctly answered items (M = 7.45, SD = 3.32).

Ten Statement Test. We administered a variation of Kuhn and McPartland's (1954) Twenty Statement Test (TST) to collect self-descriptions. Participants were asked "Who are you?" and invited to answer this question by describing different aspects about themselves on blank lines that began with "I am". Although the original version includes twenty blank lines, we only provided ten lines (TenST), to avoid reducing participants' motivation to continue with the questionnaire. The number of statements provided per person ranged from zero to 10, and totalled 4351 statements altogether (M = 6.81, SD = 2.97, $Mode$ = 10, N = 639).

Ranking task. In this task, which was based on the work by Nario-Redmond, Biernat, Eidelman, and Palenske (2004), a graphically displayed staircase with seven steps and seven self-aspects was presented (see Figure 4) with the instruction: "Imagine you had to describe yourself to another person. How important would the following aspects be for your description? Connect each statement with one of the steps". The self-aspects were "my hobbies", "that I am living in Germany", "the cultural background of my family", "that I am European" (data collection period 1)/"my education" (data collection period 2), "the city I live

in", "that I am a student of this school", and "that I am a girl/boy". Our analysis focused on the rankings, which ranged from one to seven, that students assigned to the school-related statement ("that I am a student of this school": *Mdn* = 5).

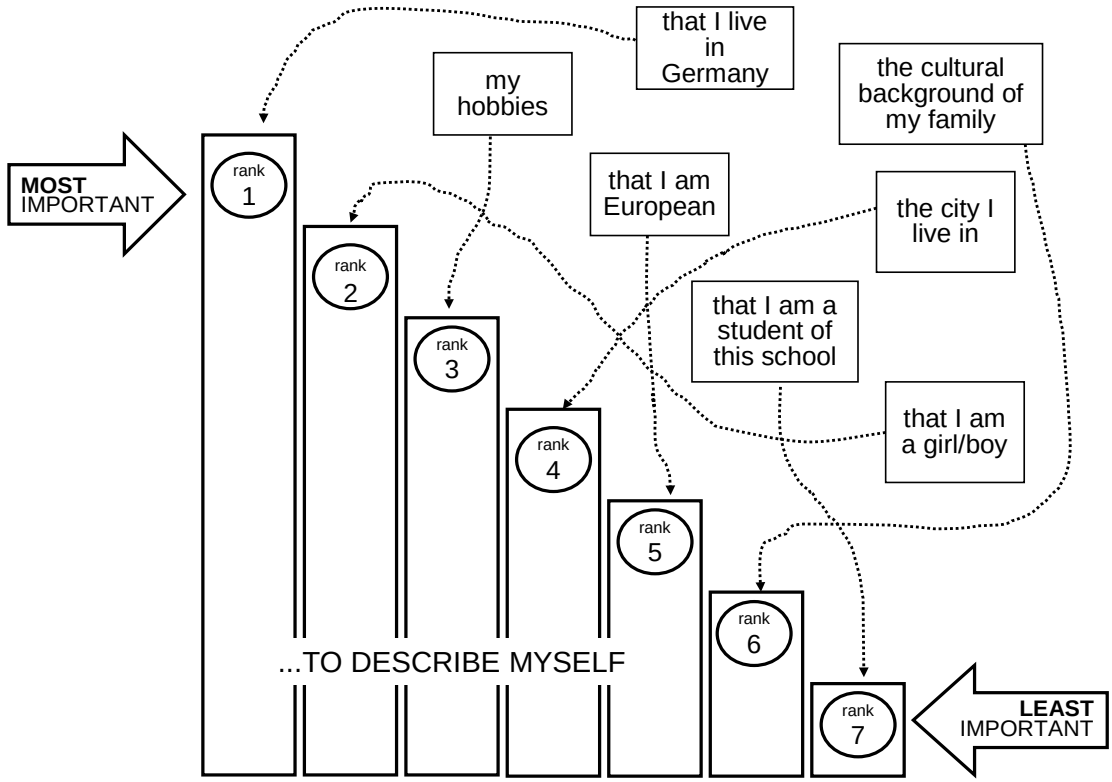

Figure 4 Example of the ranking task performed by a student of the first data collection period. In period 2 the aspect "that I am European" was replaced by "my education".

Language usage. To categorize participants according to their language use patterns (LUP), they were asked in an open answer format "What language is your mother tongue?" and then had to indicate how frequently they spoke in their first and second languages with their mother and their father. The answer format based on Boos-Nünning and Karakasoglu (2005) was a five-point rating scale, labelled 1 = ‘mother tongue only’, 2 = ‘mother tongue frequently’, 3 = ‘mother tongue and German equally often’, 4 = ‘German frequently’, 5 = ‘German only’. To provide an option to check the adequacy of our classification into LUP

groups, participants were further asked how old they were when they started to learn German and, using the same answering format as with the parents, which language they spoke with their siblings.

Data Preparation

Language use patterns. We categorized students as S-LUP versus F-LUP according to their reported language use at home, i.e. the extent to which they spoke their first and/or second language with both parents. Students who consistently used their first language with both parents and their second language only at school were categorized as S-LUP (*separate language use pattern*). Students who used their second language also in the home context were classified as F-LUP (*fused language use pattern*). More specifically, the following three LUP groups were compared:

Separate language use pattern (n = 252): This group comprised students who spoke their first language *frequently* or *only* with both parents, i.e., students who exclusively or predominantly spoke their first language with both mother and father.

Fused language use pattern – Equal Share (n = 205): This group comprised students who spoke German and their first language *equally often* with both parents, as well as students who spoke their first language *frequently* or *only* with one parent and German and their first language *equally often* with the other parent.

Fused language use pattern – Second Language Prevailing (n = 112): This group comprised students who spoke German (second language) *frequently* or *only* with both parents, as well as students who spoke German *frequently* or *only* with one parent and German and their first language *equally often* with the other parent.

Unclassified: Seventy students who spoke their first language *frequently* or *only* with one parent and their second language, German, *frequently* or *only* with the other parent were

not considered further. These students remained unclassified as they systematically switch their language within the same context depending on the interaction partner. This presents a further, qualitatively different category, namely *fused* LUP with reference to school vs. home-context but *separate* LUP according to maternal vs. paternal interactions.

TenST coding system. In an inductive-deductive procedure we developed a set of categories to analyse the statements from the TenST (see Table 3). Being interested in school-related and home-related statements we adopted them as our main categories. For the category "school-related" we identified five subcategories: school in general, school subjects, self at school, feelings about school, others at school. The category "home-related" encompassed two subcategories: family and its members and family's home (see Table 3 for examples).

As recommended by Kuhn and McPartland (1954), the statements were content-analysed and classified into the aforementioned categories. The unit of analysis was the independent clause consisting of unique meaning statements (Cousins, 1989), i.e. if someone expressed a school- and home-related statement within one line, e.g. "I am in ninth grade and I love spending time with my family.", it was coded as a school-related as well as a home-related statement. Furthermore, lines without a statement were coded as missing while those not readable were coded as illegible.

Statements were independently coded by native German speakers. Coder 1 coded the statements of the students who participated in the first data collection period ($n_{statements}$ = 3960), coder 2 the statements of the second data collection period ($n_{statements}$ = 1730). The coders were blind to the study hypotheses and were not aware of the participant's LUP. To estimate intercoder agreement, thirty per cent of the research participants of each data collection period were randomly selected and their statements coded again by the uninvolved coder (data collection period 1: $n_{statements}$ = 1330; data collection period 2: $n_{statements}$ = 510).

Intercoder agreement was very high (κ = .97 on school-related and κ = 1.00 on home-related statements for data collection period 1, κ = .99 on school-related and κ = 1.00 on home-related statements for data collection period 2).

Out of the 3896 usable statements provided (most of which referred to age, sex and hobbies), 266 (6.83%) were coded as school-related and 44 (1.13%) as home-related. To control for variations in the number of self-descriptions provided and in line with previous research employing the TST (e.g. Trafimow, Triandis, & Goto, 1991), for each student we computed the proportion of school-related statements and the proportion of home-related statements according to the total number of meaningful units provided by that student.

Table 3 Analysis of students' self-descriptions in the Ten Statements Test: Inductively-Deductively developed set of answer categories

Category	Subcategory	Explanation	Characteristic Example
School	School in general	This category contains statements about school …	
		- when school is addressed in general.	I am a pupil.
		- when school track, grade or particular school is mentioned.	I am in grade 9.
	School subjects	This category classifies positive and negative statements about school subjects…	
		- when a subject is directly mentioned.	I am not good at maths.
		- when one or more subjects are indirectly referred to.	I am good at mental arithmetic.
	Self at school	This category contains statements about personal attributes related to school…	
		- when attitudes towards and behaviour in school are expressed.	I am an unmotivated pupil.
		- when experiences in relation to school are broached.	I am at risk of staying behind.
	Feelings about school	This category contains statements which imply expression of feelings about school when …	
		- related to school in general.	I am often annoyed about school.
		- related to others in school.	I am satisfied with my teachers.
	Others in school	This category contains statements about others in school…	
		- when comparisons or distinctions are made.	I am the class representative.
		- when relationships within class are addressed.	I am the oldest in the class.

Table 3 continued

Category	Subcategory	Explanation	Characteristic Example
Home	Family and its members	This category consists of statements that comment on affiliation to one's family by mentioning … - family members or relations within the family. - attitudes towards the family or its members. - descriptions of the family and its situation. - one's positive or negative feelings towards the family and its members. - activities that occur with family members. - one's behavior towards family members	I have four sisters. I am proud of my family. I am the only child. I am angry when I argue with my sister. I enjoy being with my baby brother. I am polite with my uncles and aunts.
	Family's home	This category contains statements about the family's home… - when attitudes towards the family's home are expressed. - mentioning typical activities in the family's home context. - when one's behavior when at the family's home is described.	I enjoy being at home. I am often sitting at my desk in my room. I am a person who helps with chores a lot.

Results

All analyses were run twice, once including and once without including data collection period as an additional factor. As the results for the first were essentially identical to those for the second, here we only report the results of the analyses collapsed across both periods of data collection.

Characteristics of the LUP Groups

To assess the adequacy of our classification into LUP groups, we analysed language spoken with siblings and the age at onset of learning German as analogous indicators of language use. As shown in Table 4, an ANOVA conducted on language spoken with siblings, with the three LUP groups as independent variable, yielded a significant effect, $F(2, 526) = 75.39$, $p < .001$, $\eta^2 = .47$. Hochberg´s GT2 post hoc test revealed that the differences were significant between all groups ($p < .001$). Thus, language spoken with parents seems to be a valid indicator for the language spoken within the home context.

The same ANOVA conducted for age at onset of learning German revealed a significant effect, $F(2, 392) = 24.94$, $p < .001$, $\eta^2 = .34$. As can be seen in Table 4, S-LUP students were on average between five and six years old when they started to learn German, that is, exactly the age when children in Germany start attending school. Compared to S-LUP students, students of both F-LUP groups were significantly younger (on average between two and three), hence, they started learning German long before their first day at school (Hochberg's GT2 post hoc tests, ps $< .001$; comparison between F-LUP Equal Share and F-LUP Second Language Prevailing, $p = .19$, n.s.). In sum, this pattern of findings supports our notion that for S-LUP students, acquisition and use of their second language, German, is tied to the school context while this is not the case for F-LUP students.

To rule out that the S-LUP group differed from the F-LUP groups in second-language proficiency (as F-LUP students started to learn German earlier), we compared their performance in the German reading comprehension test, taking school track into account. As summarized in Table 4, the three LUP groups did not differ regarding school track (Gymnasium vs. lower school tracks), χ^2 (2, N = 569) = 1.5, p = .47. For reading comprehension, a two-factorial ANOVA with LUP groups and school track as between-subject factors revealed a main effect of school track, $F(1, 556) = 262.87$, $p < .001$, $\eta^2 = .56$: Unsurprisingly, students who attended a Gymnasium (M = 10.2, SD = 2.23) outperformed students who attended lower school tracks (M = 6.2, SD = 2.95). There was no significant effect involving LUP groups (main effect $F(2, 556) = 2.01$, $p = .14$, $\eta^2 = .06$; interaction effect $F(2, 556) = 1.97$, $p = .14$, $\eta^2 = .06$).

Table 4 Summary of LUP group characteristics

	Separate LUP			Fused LUP					
				Equal Share			Second Language Prevailing		
	(n = 252)			(n = 205)			(n = 112)		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Language spoken with siblings	232	2.8	1.3	197	3.6	0.8	100	4.3	1.0
Age at onset of German	180	5.7	3.9	146	3.8	2.5	69	3.0	1.8
German reading comprehension	251	7.3	3.5	199	7.5	3.1	112	8.0	3.5

The Accessibility of School- and Home-Related Self

We had expected S-LUP students to produce more school-related self-descriptions, but not more (or even fewer) home-related statements than F-LUP students. Proportions were arcsine transformed (Kanagawa, Cross, & Markus, 2001) and entered into a 3 (LUP group) by 2 (context) mixed ANOVA with context (home- vs. school-related statements) as a repeated

factor. The analysis revealed a strong main effect for context, $F(1,544) = 99.6$, $p < .001$, $\eta^2 = .16$: Unsurprisingly, more statements were school-related self-descriptions (27.9 %) than home-related self-descriptions (5.9%). More importantly, an interaction effect emerged, $F(2,544) = 3.35$, $p = .04$, $\eta^2 = .01$: The difference between the share of school- and home-related self-descriptions was stronger for S-LUP (29.3%) than F-LUP Equal Share (20.8%) and F-LUP Second Language Prevailing (16%) students (main effect LUP $F < 1$). Figure 5 displays the (non-transformed) proportions of school- and home-related statements (according to the total number of statements) students had written down in the TenST. To follow up on the interaction, we ran one-way ANOVAs with Helmert contrasts (contrast 1: S-LUP vs. F-LUP; contrast 2: F-LUP Equal Share vs. F-LUP Second Language Prevailing) on each of the two kinds of self-statements: school-related and home-related. As expected, the ANOVA for school-related self-descriptions ($F(2, 544) = 1.79$, $p = .17$) revealed no difference between the two F-LUP groups (contrast 2: $p = .38$) but a significant difference between F-LUP and S-LUP (contrast 1: $p = .05$). S-LUP students ($M = 0.33$, $SD = .51$) described themselves with more school-related statements than F-LUP students ($M = 0.26$, $SD = .43$). The analysis for home-related statements ($F(2, 544) = 2.23$, $p = .11$) revealed no difference between the two F-LUP groups (contrast 2: $p = .98$) but a significant difference between F-LUP and S-LUP (contrast 1: $p = .04$). S-LUP students ($M = 0.04$, $SD = .16$) described themselves with fewer home-related statements than F-LUP students ($M = 0.07$, $SD = .22$).

To examine whether the differences in the share of school-related statements might alternatively be explained by variations in the assigned importance, we analysed the ranking task. As illustrated in Figure 5, a Kruskal-Wallis analysis conducted on the school-related self-aspect variable revealed no significant differences regarding the rank assigned, $H(2) = 2.06$, $p = .36$. Also, Mann-Whitney tests comparing (1) S-LUP with F-LUP groups, $U =$

32.53, p = .22, z = -1.25, r = -.06, and (2) the F'LUP Equal Share group with the F'LUP Second Language Prevailing-group, U = 8.93, p = .48, z = -0.71, r = -.04, were not significant. Together, these results suggest that S-LUP students described themselves more frequently with school-related statements than F-LUP students without assigning a higher importance to the school-related self-aspect.

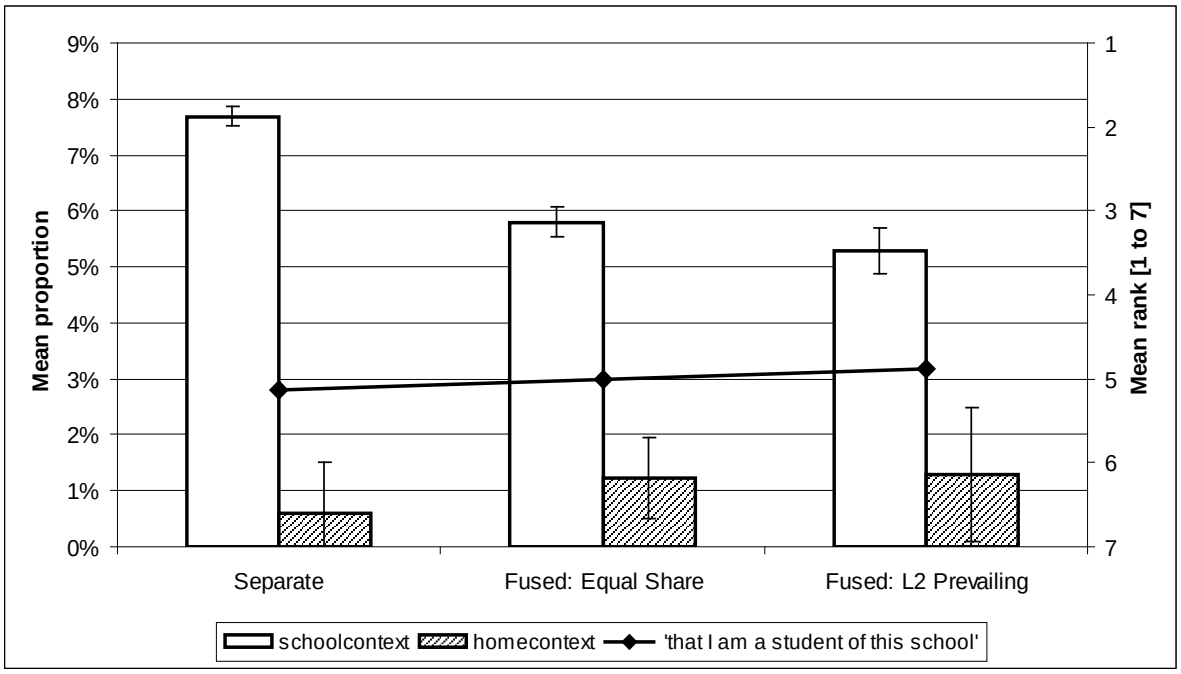

Figure 5 Mean proportions of school-related and home-related self-descriptions in the TenST and mean importance assigned to the school-related self ("that I am a student of this school") in the ranking task by language use pattern. Error bars represent standard errors

Discussion

The starting point of Study 1 was the assumption that for people with everyday multiple language use the representation of self-knowledge pertaining to a specific social context is linked to the language that is typically spoken in this context.

To test our assumption, we differentiated between two language use patterns: bilingual immigrant students with a S-LUP who speak German only when at school, and students with

a F-LUP who speak German also when in the home context; and analyzed the content of spontaneous self-descriptions students had produced in German language while at school. Based on our assumption that the representation of self-knowledge is influenced by the language in which it has been acquired, we expected to find differences in the accessibility of context-related self-knowledge pertaining to the *self at school* and the *self at home* as an effect of students' language use patterns.

As expected, S-LUP students provided more school-related statements when describing themselves in German while at school than F-LUP students. At the same time, S-LUP students provided fewer statements referring to their home context than F-LUP students. To rule out the alternative explanation that this pattern of findings occurred due to possible differences regarding the importance of the self-aspects *self at school* and *self at home*, a second self-description task was analysed but did not reveal any differences regarding the importance assigned to self-aspects.

Taken as a whole, our results show a facilitating effect in accessing context-dependent self-knowledge when the language at retrieval and the language in which specific self-knowledge contents are typically acquired and used match. Thus, we conclude that the findings of Study 1 support the idea of a language-dependent self-representation in people with everyday multiple language use.

Study 2. How different patterns of first and second language use influence immigrant students' access on context-bound self-esteem[6]

Study 1 provides initial evidence that contents of self-knowledge are mentally associated with the language that is typically used when in the respective social context. To substantiate the findings of Study 1 and to replicate the effect of different language use patterns on the accessibility of context-dependent self-knowledge, in Study 2, we again distinguish between *S-LUP* and *F-LUP* operationalized by language use with mother and father in bilingual immigrant students, and focus on the accessibility of self-knowledge pertaining to the social context of the school and family. However, in Study 2, we now focus on the accessibility of affective self-knowledge.

Based on the notion that context activates self-knowledge pertaining to the appropriate self-aspect (Hannover, 1997; Linville, 1985; Markus, 1977), affective components of self-knowledge associated with the respective self-aspect should be activated and accessible also depending on the context. Hence, when at school the affect associated with the self-aspect pertaining to the school context should be predominantly accessible and determine a person's overall affect (Linville, 1985). Affect associated with other self-aspects, e.g. pertaining to the family context, on the other hand, should not be accessible and thus not interfere with the

[6] This study uses data from the National Educational Panel Study (NEPS): Starting Cohort 4 – 9th Grade, *doi:10.5157/NEPS:SC4:1.0.0*. From 2008 to 2013, NEPS data were collected as part of the Framework Programme for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, the NEPS survey is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

person's overall affect unless cues in the environment trigger the activation of any other self-aspect.

Based on our assumption of a language-dependent self-representation and in line with our findings from Study 1, we expect that for S-LUP students, self-knowledge pertaining to the school and the home context are mentally represented in different clusters within the self-concept that are additionally distinct regarding the languages mentally associated with the representation of the clusters. As a consequence, we expect that for S-LUP students the *self at school* and the *self at home* are two distinct sources for overall affect. For F-LUP students, we expect these two sources to be less distinct as the school and the family context, and the mental representation of these self-aspects accordingly share the same language.

In Study 2, we use data from the National Educational Panel Study (NEPS, Blossfeld, Roßbach, & von Maurice, 2011) in order to investigate our assumptions with an adequate number of S-LUP and F-LUP students. Questionnaire data contains students' ratings of satisfaction with different domains of their lives. To test our assumptions, we employ these ratings as proxy variables for the affect associated with the self-aspects pertaining to school and to the family context. We investigate whether language use pattern moderates the effect of affect associated with two different social contexts, school and family, when predicting global self-esteem, which had also been assessed in the questionnaire.

Our hypothesis for Study 2 read that S-LUP students access an additional source of self-esteem when being specifically asked about the home context while for F-LUP students no such effect emerges when activating the self-aspect pertaining to the family.

Method

For this study, we analyzed data that were collected in the framework of the National Educational Panel Study (NEPS; Blossfeld, Roßbach, & von Maurice, 2011). More precisely, we used data from the cohort of ninth grade students from all over Germany. Data were collected in the classrooms during regular school hours. The language of assessment was German.[7]

Participants

Being only interested in bilingual immigrant students, in a first step, we selected participants who had indicated a first language different from German (n = 2105). Major first languages reported in the sample were Turkish (19.3%), Russian (15.1%), Arabic and English (10.5% both). In a second step, only students who had answered questions regarding their language use with their parents were selected (n = 1695). In a third step, only students whose language use pattern was clearly determinable as *separate* or *fused* were considered further (see section on Data Preparation). The selected sample consisted of 499 ninth graders, the proportion of girls being slightly higher (n = 256, 51.3%) than that of boys (n = 243, 48.7%).

Measures

The following measures were used for our analysis.

[7] For more detailed information see the methodological report provided by the International Association for the Evaluation of Educational Achievement (IEA Data Processing and Research Center, n.d.)

Satisfaction with family and school situation. Students were asked for their satisfaction with regard to different domains of their life on single items with an eleven-point rating scale, ranging from 0 to 10, with the extremes labeled 0 = *not at all satisfied* and 10 = *totally satisfied*. Answers on the satisfaction with family item, "How satisfied are you with your family?", ranged from 0 to 10 (M = 8.14, SD = 2.42). The item on satisfaction with school, reading "How satisfied are you with your school situation?", received answers ranging from 0 to 10 (M = 6.53, SD = 2.48).

Global self-esteem. The German version of the Rosenberg Self-Esteem Scale (RSES, Rosenberg, 1965) was administered (translation by Ferring & Filipp, 1996, partially revised by von Collani & Herzberg, 2003). The RSES includes ten items, with one half being positively phrased (e.g., "I feel I have a number of good qualities.") and the other half being negatively formulated (e.g., "At times I think I am no good at all."). Items were rated on a five-point Likert scale labeled 1 = *I strongly disagree*, 2 = *I disagree*, 3 = *neither nor*, 4 = *I agree*, and 5 = *I strongly agree*. Answers on negatively poled items were reversed. Following Huang and Dong (2012) a one-factor model was chosen, the obtained alpha coefficient was .81, indicating satisfying internal consistency. Participants' sum scores for global self-esteem ranged from 13 to 45 (M = 34.7, SD = 5.8).

Language usage. Participants who as a child had learned another language than German in the home context were asked in an open answer format to indicate the name of that language. Subsequently, they were asked to indicate how frequently they used their languages to speak with their mother and father. A five-point rating scale labeled 1 = *German only*, 2 = *mostly German, sometimes the other language*, 3 = *mostly the other language, sometimes German*, 4 = *the other language only*, and 5 = *n/a* (not applicable) being the answering format.

Data Preparation

Language use patterns. Analogous to the classification into different language use pattern groups from Study 1, bilingual immigrant students were categorized according to their reports on language spoken with their mother and their father as either having a *separate language use pattern* (S-LUP) or a *fused language use pattern* (F-LUP).

Separate language use pattern (S-LUP, n = 258): Students who had indicated that they spoke *the other language only* with both their parents were classified as having a separate language use pattern, i.e. students with a context-dependent switch of languages, who exclusively use their first language with both mother and father at home and their second language, German, only when at school.

Fused language use pattern (F-LUP, n = 241): Participants who had answered the question on language use with both their parents as *German only* or with one parent *German only* and the other parent *mostly German, sometimes the other language* were classified as having a fused language use pattern, i.e. students with a context-independent switch of languages as their use of German is not restricted to the school context but also used when at home.

Unclassified: One thousand one hundred and ninety-six students remained unclassified as the language use with their parents had a different combination than separate or fused LUP and were not included in our analyses.

Results

Preliminary Analysis

Descriptive statistics of all variables used in the analyses are displayed separately for S-LUP and F-LUP students in Table 5. Bivariate correlations show moderate positive correlations

between global self-esteem, satisfaction with school, and satisfaction with family in both subsamples (*r*s > .36), except a somewhat weaker positive correlation between satisfaction with school and global self-esteem in the F-LUP subsample (r = .15, p = .02). Group comparisons of the S-LUP and F-LUP groups revealed that students differed significantly regarding their satisfaction with school and satisfaction with family: S-LUP students scored significantly higher regarding their satisfaction with school, $t(456) = 2.07$, p = .04, and their satisfaction with family, $t(453) = 2.16$, p = .03 than F-LUP students. Regarding global self-esteem, there was no statistically significant difference between the two language use pattern groups, $t(426) = .29$, p = .78.

Table 5 Summary of intercorrelations, means, and standard deviations for scores on satisfaction with school, satisfaction with family, and global self-esteem presented separately for Separate and Fused LUP group

Measure	*1*	*2*	*3*	*N*	*M*	*SD*
1. Satisfaction with school	-	.36***	.42***	236	6.76	2.50
2. Satisfaction with family	.43***	-	.41***	234	8.38	2.31
3. Global self-esteem	.32***	.15*	-	214	34.56	5.94
N	222	221	214			
M	6.28	7.89	34.72			
SD	2.47	2.53	5.64			

Note. Intercorrelations for S-LUP (n = 258) are presented above the diagonal, and intercorrelations for F-LUP (n = 241) are presented below the diagonal. Means and standard deviations for S-LUP students are presented in the vertical columns, and means and standard deviations for F-LUP students are presented in the horizontal rows.

* p < .05, *** p < .001.

Global self-esteem as a function of satisfaction with school and with family situation moderated by language use pattern

We expected to find a moderation effect of LUP when predicting global self-esteem from affect associated with self-aspects pertaining to different (language) contexts. On these

grounds, we employed students' ratings on satisfaction with school and satisfaction with family as proxy variables for the affect associated with two self-aspects considered meaningful in adolescence. Furthermore, school and family represent two social contexts where different languages are used for S-LUP students but share the same language for F-LUP students. Students' answers had been assessed while in the school context, in German. As for both LUP groups likewise, the language spoken in the school context is German, we did not expect to find a moderating effect of LUP regarding satisfaction with school. However, as the family context is linked to the use of different languages for S-LUP and F-LUP students, we expected LUP to moderate the effect of satisfaction with family when predicting global self-esteem.

In order to test the hypothesized moderation of LUP, we conducted multiple regression analysis including the interaction terms of satisfaction with school and satisfaction with family by LUP. In the first step (Step 1), we tested whether satisfaction with school and satisfaction with family predicted global self-esteem. As expected, both proxy variables proofed to be significant predictors of global self-esteem (see Table 6). The effect of LUP was not statistically significant. In the second step (Step 2), we included the interaction terms of satisfaction with school by LUP and satisfaction with family by LUP. Analysis showed no significant interaction of satisfaction with school by LUP but demonstrated a statistically significant interaction of satisfaction with family by LUP, $b = .73$, $p = .002$. As displayed in Table 6, the overall regression model was statistically significant and explained 17% of the variance in global self-esteem, $F(5, 419) = 18.57$, $p < .001$.

Table 6 Multiple regression analyses predicting global self-esteem from satisfaction with school and satisfaction with family moderated by LUP

	Step 1			Step 2		
	B	*SE B*	β	*B*	*SE B*	B
Constant	34.94***	.37		34.87***	.36	
Satisfaction with school	0.73***	.11	.31	0.73***	.17	.31
Satisfaction with family	0.38**	.12	.16	0.03	.16	.01
Language Use Pattern (LUP)	-0.56	.52	-.05	-0.57	.51	-.05
LUP x Satisfaction with school				0.00	.23	.00
LUP x Satisfaction with family				0.73**	.23	.21
R^2	.15			.17		
F	26.43***			18.57***		
ΔR^2				.02		
ΔF				11.68		

Note. $N = 425$. Following Aiken and West (1991) continuous predictors were mean-centred before calculating interaction terms and performing the regression analysis. LUP is dummy coded (1 = Separate LUP, 0 = Fused LUP). Product terms represent the LUP-by-satisfaction with school and LUP-by-satisfaction with family interaction.

** $p < .01$, *** $p < .001$.

In order to investigate the impact of LUP in more detail, we performed hierarchical regression analyses separately for S-LUP students and F-LUP students. In the first step of the regression analyses, students' global self-esteem was regressed on satisfaction with school. In the second step of the regression analysis, satisfaction with family was entered. We expected that both, for S-LUP and for F-LUP, satisfaction with school would be a significant predictor for global self-esteem. Regarding satisfaction with family as a second predictor in the model, we expected a significant increase in the variance explained in global self-esteem for S-LUP students, but not for F-LUP students.

Analysis of the S-LUP subsample revealed that the model was statistically significant overall in Step 1, $F(1, 210) = 44.80$, $p < .001$, $R^2 = .17$, and Step 2, $F(2, 209) = 35.54$, $p <$

.001 , R^2 = .25. In the first step, satisfaction with school predicted global self-esteem, in that the more students were satisfied with their school situation, the higher their global self-esteem, beta = .42, $t(210) = 6.69$, $p < .001$. Including satisfaction with family in Step 2, satisfaction with school remained a significant predictor, beta = .31, $t(209) = 4.89$, $p < .001$, and satisfaction with family additionally explained 8% of variance in global self-esteem, beta = .30, $t(209) = 4.67$, $p < .001$ (see Table 7).

For F-LUP students, as well, the overall model reached statistical significance in Step 1, $F(1, 211) = 23.58$, $p < .001$, R^2 = .10, and Step 2, $F(2, 210) = 11.75$, $p < .001$, R^2 = .09. In the first step, satisfaction with school predicted global self-esteem, beta = .32, $t(211) = 4.86$, $p < .001$. In the second step, satisfaction with school remained a significant predictor, beta = .31, $t(210) = 4.29$, $p < .001$, satisfaction with family, however, did not contribute to the explanation of further variance in global self-esteem, beta = .01, $t(210) = .17$, $p = .86$ (see Table 7).

Table 7 Hierarchical regression analyses of global self-esteem on satisfaction with school and satisfaction with family separately for Separate and Fused Language Use Pattern group

	Step 1			Step 2		
	B	*SE B*	β	*B*	*SE B*	β
Separate Language Use Pattern[a]						
Constant	28.02***	1.05		23.37***	1.41	
Satisfaction with school	0.98***	.15	.42	0.73***	.15	.31
Satisfaction with family				0.76***	.16	.30
Fused Language Use Pattern[b]						
Constant	30.00***	1.04		29.86***	1.34	
Satisfaction with school	.75***	.15	.32	.73***	.17	.31
Satisfaction with family				.03	.17	.01

Note. [a]$n = 212$. [b]$n = 213$.

*** $p < .001$.

Discussion

The intention of Study 2 was to provide further evidence for a language-dependent self-representation in people with everyday multiple language use.

To test our assumption, we used questionnaire data of almost 500 bilingual immigrant students provided by the National Educational Panel Study (NEPS, Blossfeld, Roßbach, & von Maurice, 2011). Within a comprehensive questionnaire, participating students had provided ratings on their satisfaction with the situation at school, their satisfaction with the situation in the family, and their global self-esteem, while they were at school, in the language of the school, German. According to the language spoken at home when with their parents, we differentiated between students who use German only when at school (Separate LUP) and students who use German also when at home (Fused LUP), and compared S-LUP students and F-LUP students regarding the extent to which the different context-dependent sources of self-esteem predicted their global self-esteem.

Based on our assumption that self-knowledge pertaining to a context is linked to the language that is typically used in the specific social context, we expected that for bilingual immigrant students who use different languages when at school and when at home, affect associated with the corresponding self-aspects would be more distinct sources of global self-esteem, whereas for bilingual immigrant students using German across contexts affect associated with the school and family self-aspect would be integrated sources of global self-esteem.

As expected, LUP was a significant moderator of the relationship between satisfaction with family and global self-esteem. Furthermore, predicting global self-esteem from satisfaction with school and satisfaction with family revealed that for bilingual immigrant students who use German only when at school, accessing the self-aspect pertaining to the

home context increased the variance explained in global self-esteem. For bilingual immigrant students who use German also when at home, on the other hand, accessing the self-aspect pertaining to the home context did not contribute to further explanation of variance in global self-esteem.

As this study was a secondary analysis of data that was not primarily intended to serve the analysis we conducted in this study, we had to use satisfaction with different contexts as a proxy variable for context-dependent affect (cf. Diener & Diener, 1995). Furthermore, preliminary analysis of the independent variables of our model revealed differences in S-LUP's and F-LUP's levels of satisfaction with both contexts. Explanations for these differences could possibly be caused by differences in background variables, e.g. socio-economic background. Though the NEPS data comprises several variables of socio-economic background, we did not consider any variables of socio-economic background as they were not in the focus of our analyses and we did not have any hypothesis concerning these variables.

To summarize, we understand the results obtained in this study showing that self-knowledge is associated with the language that is typically used when the respective affective content is acquired as evidence suggesting a language-dependent self-representation resulting from everyday multiple language use that is decisive also for the accessibility of affective components of self-knowledge. While for bilingual immigrant students who use the same language across contexts affective components of self-knowledge are less differentiated and feed global self-esteem as one integrated source, for bilingual immigrant students who use different languages when interacting in different contexts, however, affect associated with the respective social contexts can be accessed independently and thus context-dependent sources of self-esteem remain more differentiated from each other.

Study 3. Exploring language-dependent self-representation in school students with everyday multiple language use.

The main objective of Study 3 is to test a new method for exploring language-dependent self-representation in people with everyday multiple language use. We present an adapted, bilingual version of the trait sorting task that has originally been developed by Linville (1985) for the assessment of self-complexity. In the bilingual trait sorting task, participants are free to describe different aspects of their self by assigning traits in either the one or the other language. Based on the assumption that self-knowledge is represented in the language in which it is typically acquired and used, we anticipate that the trait sorting results of people with everyday multiple language use will feature a mixture of traits in both of their languages.

Moreover, as people with everyday multiple language use typically distribute their languages across different social contexts, we expect that some self-aspects are primarily represented by traits in one language and other self-aspects to be primarily represented and associated with traits in the other language. We test this notion by examining whether the extent to which participants use one language in a particular social setting (e.g. at school) corresponds to the extent to which they use traits in the same language to describe the corresponding self-aspect (e.g. self at school).

Furthermore, we analyze the trait sorting results and introduce two measures to capture language-dependent self-representation: (1) the proportion of traits used in one language, and (2) the extent to which participants' self is compartmentalized along language lines. Compartmentalization along language lines describes the extent to which self-aspects are represented by traits in one language only, as opposed to mixed-language self-aspects. We test

whether language-dependent self-representation is independent of language proficiency and language use.

Finally, we expect language-dependent self-representation to describe an autonomous concept of self-knowledge organization. We test our notion by examining the relation between measures of language-dependent self-representation and different measures of self-complexity.

To summarize, in Study 3, we examine the impact of everyday multiple language use on self-representation introducing a novel approach to more directly assess language-dependent self-representation in people with everyday multiple language use.

Method

This research was conducted in Norway. We approached school students attending Grade 9 and 10 of an international school. The student body consists of Norwegians, as well as students of various international backgrounds. Norwegian as the dominant language in society is a legally required subject for all students, but the main language of instruction at school is English. Participation was voluntary and anonymous.

Participants

Twenty-nine students (11 female, 18 male), ranging in age from 13 to 15 years (M = 14.27, SD = 0.79), participated in the study. Ten students (33.3%) reported to be born outside of Norway. Twenty-one students (70.0%) reported to be fluent in further languages than English and Norwegian (three languages: n = 12, four languages: n = 5, five languages: n = 4).

Measures

Data collection took place during regular school hours in the classrooms of the school. Task instructions and questionnaire were presented in English.

Bilingual trait sorting task. Based on the procedure proposed by Linville (1985, 1987) to assess self-complexity, participants received an envelope containing 33 randomly ordered cards and a recording sheet. In the bilingual trait sorting task each card was printed on both sides with the same trait in different languages together with a little index number. Traits on one side corresponded to the traits originally used by Linville (1985, 1987) in English. The other side contained the Norwegian (bokmål) translation of this trait. Translations were made independently by two English-Norwegian bilinguals. In very few cases - where their translations were not in agreement - the term that is more common according to the Norwegian Words Database (Lind, Simonsen, Hansen, Holm, & Mevik, 2013) was chosen (the original trait list and the Norwegian translations are depicted in Table 9). Instructions were read out loud by the experimenter (see Appendix A for instructions, material, and a detailed procedure). Similar to the original instructions published by Linville (1987), participants were invited to think about different aspects of themselves and their lives and to describe these aspects by assigning the appropriate traits of those provided on the cards. Participants were instructed that they could form as many or as few self-aspects as they wished and assign as many or as few traits to each self-aspect as they want. Traits they did not feel to be descriptive of any self-aspect could be set aside, and the same trait could be used to describe different self-aspects. Moreover, in the instructions for the bilingual trait sorting task, participants were instructed that with every trait they want to use they have the choice whether to use the trait on the one side or on the other side of the card and to record the

respective number on their recording sheets. Participants were given 30 minutes to complete the bilingual trait sorting task.

Language Proficiency in English and Norwegian. To capture participants' language proficiency in English and Norwegian (bokmål), we administered two self-constructed C-tests. Text passages about the European Union (EU) were transformed into C-tests by removing the second part of every second word beginning with the second sentence (Klein-Braley, 1985). The English C-test version, a text about the History of the EU, included 46 gaps. The Norwegian C-test version, about the Nobel Peace Prize, consisted of 42 gaps (both C-test versions are presented in Appendix B). Participants were instructed to fill in as many correct missing syllables as possible within four minutes. Analysis revealed that three participants scored zero in the Norwegian C-Test version. Due to their apparently lacking proficiency in Norwegian (bokmål) they were excluded from the sample for further analysis. The remaining sample, including 26 students, on average correctly filled in 30.46 gaps (*SD* = 6.57) in the English C-Test version, and 21.38 gaps (*SD* = 7.45) in the Norwegian C-Test version.

Everyday Language Use and Self-Rated Proficiency. Questions were taken from the Language and Social Background Questionnaire (LSBQ, Luk & Bialystok, 2013) to assess daily usage of language and self-rated proficiency in each language. To learn about participants' everyday language use they were asked to rate the proportion of their use of English at school and at home on a visual analog scale (VAS) ranging from *All English* to *No English*. Judgments were made separately for speaking, listening, reading and writing. Scales were transformed to percentages, with higher values indicating more English use. With respect to the school context, all participants reported using English, the language of instruction, more than 50% of the time (*M* = 79.90, *SD* = 10.18). With respect to the home

context, participants on average reported using English less than 50% of the time (M = 48.03, SD = 19.06). Participants were furthermore asked to rate their proficiency in English and in Norwegian relative to native speakers, separately for speaking, listening, reading and writing using visual analog scales (VAS) ranging from *No proficiency* (1) to *Fully fluent* (20). VAS responses were treated as interval variables and self-rated proficiency in each language was calculated as the mean. On average, participants rated their proficiency rather native-like: M = 18.50, SD = 1.80 for English; M = 17.36, SD = 3.49 for Norwegian.

Results

Preliminary Analysis of the Recording Sheets from the Bilingual Trait Sorting Task

Before examining language-dependent self-representation as assessed with the bilingual trait sorting task, we undertook a preliminary analysis of the self-aspect labels and the traits that had been assigned by participants. Furthermore, we were interested in the relation between English language use and the extent to which participants used traits in English.

Analysis of Self-Aspect Labels

A first inspection of the recording sheets revealed that altogether participants (N = 26) created 130 self-aspects. Except for two self-aspects, all were labeled in English. As shown in Table 8, which presents a categorization of self-aspects together with typical examples, participants mainly reported self-aspects pertaining to different social contexts (51.5%), such as home, and school. Furthermore, participants generated self-aspects pertaining to different situations (25.4%), and hypothetical selves (20.8%).

Table 8 Types of self-aspects generated with examples and their prevalence

Type / Subtype	Examples	Percentage
Social Contexts		
Home	at home, with my parents, at home and family	16.2%
School	at school, school environment	14.6%
Friends	with friends, with peers, with my friends	13.9%
Leisure	church, basketball community, guitar lessons	6.9%
Situations		
Social	how I am to new people, to others, social	9.2%
Alone	by myself, alone	3.9%
Affective	when I am angry, when I do what I love	2.3%
Other	on vacation, at important events	10.0%
Hypothetical Selves		
True Self	I am, in general, always, traits that do not describe me	11.5%
Ideal Self	I wish I was, I don't like being, I think I should be	7.7%
Temporary Self	sometimes, I am usually	1.5%
Others/Not Readable		
	I dislike people who are, thoughts	2.3%

Analysis of associated traits

Participants (N = 26) altogether used 882 traits for their self-descriptions in the bilingual trait sorting task. The majority of traits was used in English: 665 traits were used in English (75.4%) and 217 traits were used in Norwegian (24.6%).

Table 9 shows the traits that were presented on both sides of the cards and displays the percentages of each trait being used within each language. Traits used most often in English were *relaxed* (n = 43), *humorous* (n = 39), and *competitive* (n = 37). Traits used most often in Norwegian were the respective translations of *relaxed* (n = 20), *lazy*, *soft-hearted*, and *industrious* (ns = 14). Traits that were used least often were *conformist* (n = 2), *assertive* (n =

5), and *unfriendly* (*n* = 6) in English. Traits that were used least often in Norwegian translation were *shallow*, *conformist* (*n*s = 1), *reflective*, and *not studious* (*n*s = 2).

Relation between English language use and extent of traits in English

We expected that the extent of English language use would interact with the extent to which participants use traits in English to describe a specific self-aspect. To test this hypothesis, we identified participants who had created school self-aspects and who had created home self-aspects in the trait sorting task. Of all participants, nineteen had created a school self-aspect and twenty a home self-aspect (one of which had created two separate home self-aspects). Altogether, school self-aspects were described using 111 English traits and 18 Norwegian traits, and home self-aspects were described using 112 traits in English and 28 traits in Norwegian. The proportion of traits used in English for the description of self-aspects pertaining to the school, where participants speak English almost all of the time, was .86; the proportion of traits used in English for the description of self-aspects pertaining to the home context, where the extent of English language use on average is smaller, was .80. Although school self-aspects on average were represented slightly more in English than home self-aspects, the difference was not significant, $\chi^2(2, N=19) = 1.73$, $p = 0.19$. Similarly, a scatter plot (see Figure 6) displaying the individuals' relation between English language use in the school or the home context and the extent to which the respective self-aspect was described using traits in English did not show any distinct pattern indicative of the expected relationships. Accordingly, correlational analysis did not reveal any significant relations between English language use in a specific context and the extent to which the respective self-aspect was represented in English in the trait sorting task: for school context and school self-aspect, $r(17) = -.14$, $p = .56$; and for home context and home self-aspect $r(19) = .05$, $p = .85$.

Table 9 List of English traits and Norwegian translations with the percentages as used by participants

English traits		**Norwegian translation**	
	Percentage		Percentage
Competitive	5.56	Konkurrerende	2.30
Quiet	4.06	Stille	4.61
Relaxed	6.47	Avslappet	9.22
Rude	1.50	Usivilisert	2.30
Organized	4.81	Organisert	2.76
Unfriendly	0.90	Uvennlig	3.23
Affectionate	1.80	Kjærlig	2.76
Studious	2.26	Flittig	4.15
Reflective	3.16	Reflektert	0.92
Soft-Hearted	2.41	Godhjertet	6.45
Not Studious	3.16	Ikke Flittig	0.92
Unconventional	1.50	Ukonvensjonell	1.84
Impulsive	1.35	Impulsiv	4.61
Shallow	1.35	Overfladisk	0.46
Reserved	2.41	Reservert	1.38
Unorganized	3.31	Uorganisert	2.76
Conformist	0.30	Konform	0.46
Irresponsible	2.56	Uansvarlig	2.30
Humorous	5.86	Humoristisk	2.76
Reckless	3.31	Hensynsløs	2.76
Anxious	2.56	Engstelig	1.84
Individualistic	2.86	Individualistisk	1.84
Insecure	3.16	Usikker	2.30
Mature	5.11	Moden	2.30
Imaginative	4.06	Fantasifull	2.76
Lazy	4.96	Lat	6.45
Industrious	1.50	Arbeidsom	6.45
Outgoing	4.06	Utadvendt	1.84
Assertive	0.75	Påståelig	2.76
Playful	4.36	Leken	4.15
Sophisticated	3.01	Sofistikert	1.84
Rebellious	3.31	Opprørsk	2.30
Emotional	2.26	Følsom	4.15

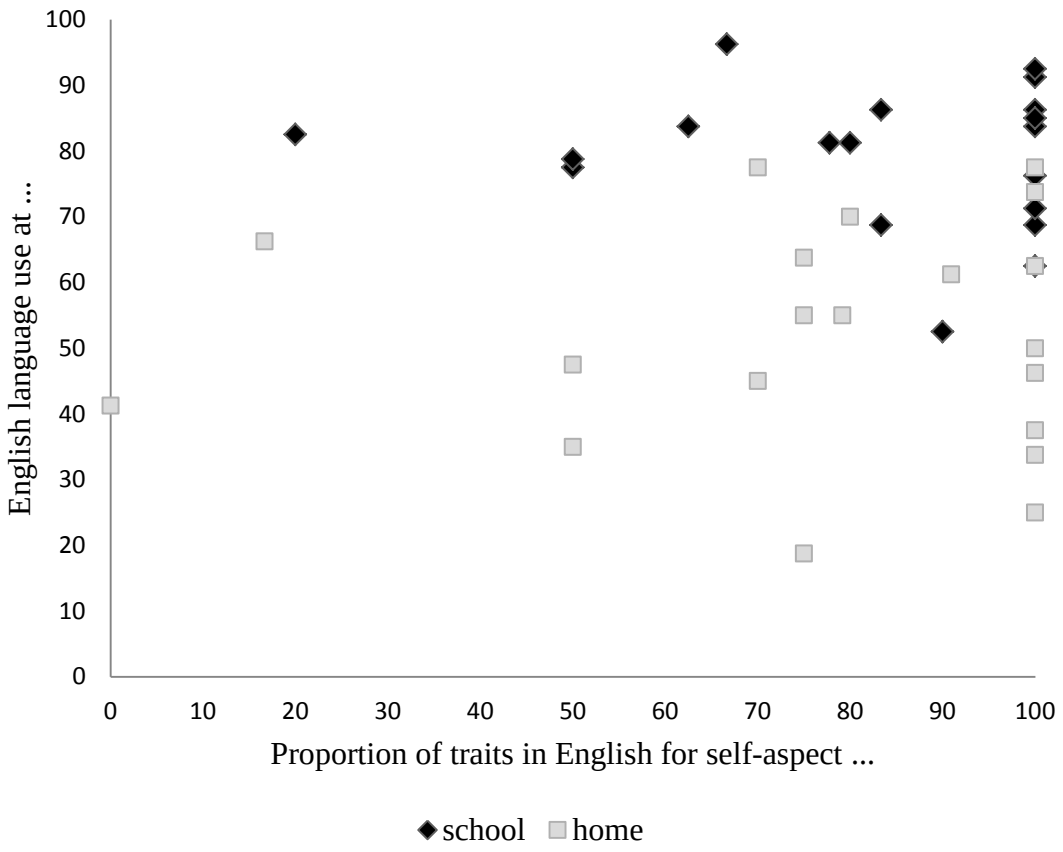

Figure 6 Scatter plot of Proportion of traits in English for self-aspect school and English language use at school, and of Proportion of traits in English for self-aspect home and English language use at home respectively

Measures of Self-Representation

Based on the trait sorting result of each participant different measures to describe the properties of their self-representation were computed. To capture language-dependent self-representation, we calculated two measures: the proportion of traits used in English and the compartmentalization along language lines. Furthermore, to capture self-complexity in the bilingual trait sorting task, we calculated the traditional measure of self-complexity as suggested by Linville (1985, 1987), as well as the alternative measures of self-complexity as

proposed by Rafaeli-Mor and colleagues (1999). For a detailed procedure on the computation of all scores see Appendix A of this dissertation.

Language-Dependent Self-Representation

Proportion of Traits in English (*PropEng*). On average, sorts contained a higher proportion of traits in English (M = .75, SD = .22) than in Norwegian. Five subjects' sorts contained traits in English only. There was no sort that only contained traits in Norwegian. In the subsample of 21 participants who used traits in English and in Norwegian, the proportion of traits in English on average was .69 (SD = .21).

Compartmentalization along Language Lines (*CaLL*). *CaLL* scores represent the extent to which language serves as an organizing principle in representing different self-aspects, i.e. feature a bilingual self-representation which is compartmentalized along language lines. *CaLL* scores are obtained using chi-square statistic and represented by Cramer's *V*. Cramer's *V* can range from 0 to 1, where 0 represents a sort where the language of the traits was chosen at random and 1 represents a sort that is perfectly compartmentalized along language lines. The chi-square statistic, thus, Cramer's *V*, can only be calculated when participants used traits in both languages. For five participants who used traits in English only for their self-description, *CaLL* scores were set to zero as these participants did not make use of the other language, Norwegian, in organizing their self-knowledge. On average, *CaLL* was .24 (SD = .18). In the subsample of 21 participants who had used traits in both, English and Norwegian, the *CaLL* scores ranged between .01 and .61 (M = .30, SD = .16).

The correlation between *PropEng* and *CaLL* was negative and not significant in the full sample, $r(24) = -.38$, $p = .58$. In the subsample of 21 participants with a valid *CaLL* score, also, there was no significant correlation between the two measures representing language-

dependent self-representation, $r(19) = -.02$, $p = .95$. Visual inspection of the data confirmed the presumption, that the negative relationship in the full sample was essentially driven by those five participants who had used traits in English only, thus had a maximum value for *PropEng* and the artificial zero-value on *CaLL*.

Self-Complexity

Self-Complexity (*SC*). *SC* scores in the present study with two times 33 traits - where the maximum possible value representing a highly complex structure is $\log_2 66 = 6.04$, and the minimum possible value representing low complexity is zero - self-complexity scores (*SC*) ranged from .87 to 3.18 ($M = 1.80$, $SD = 0.63$).

Number of Self-Aspects (*NSA*). Participants reported between 3 and 8 self-aspects ($M = 5.15$, $SD = 1.62$).

Overlap (*OL*). *OL* scores ranged from 0 to .63, with a small score indicating no or little overlap and larger scores indicating relatively more overlap among the self-aspects ($M = .25$, $SD = .18$).

As reported in Table 10, intercorrelations of measures of self-complexity indicated that the traditional self-complexity score (*SC*) was strongly positively related to the number of self-aspects (*NSA*), $r(24) = .59$, $p = .001$., but not significantly related to the overlap measure (*OL*) ($p = .76$). *NSA* and *OL* were also not significantly correlated ($p = .20$).

Language-Dependent Self-Representation as a concept of self-knowledge organization

We propose that language-dependent self-representation describes an autonomous concept of self-knowledge organization. We test this notion relating measures of language-dependent self-representation to language proficiency and language use as well as to self-complexity scores. Correlational analyses were run separately for the full sample and the subsample of participants who had used traits in English and in Norwegian. All findings are presented in Table 10. We first describe the key findings for the association of language-dependent self-representation with language proficiency and language use, and then of language-dependent self-representation with self-complexity.

Independence of language-dependent self-representation from language proficiency and language use

We expected that language-dependent self-representation would not simply reflect participants' language proficiency and language use.

As expected, correlational analysis with the full sample revealed no significant correlation between the proportion of traits used in English (*PropEng*), English and Norwegian language proficiency as obtained by the C-Test, self-rated language proficiency in English and in Norwegian, and English language use at school and at home (*p*s > .30). Also, there was no significant correlation between compartmentalization along language lines (*CaLL*) and any measure of language proficiency and language use (*p*s > .11) when all participants were included.

In the subsample of 21 participants, a significant positive correlation was found between compartmentalization along language lines (*CaLL*) and the score obtained in the Norwegian C-Test, $r(19) = .47$, $p = .03$. The higher the extent of compartmentalization along language lines in the bilingual trait sorting task, participants tended to score high on Norwegian

language proficiency as obtained by the C-Test. All remaining correlations were non-significant.

Relation between language-dependent self-representation and self-complexity

We expected that language-dependent self-representation describes an organizing principle that is independent of the concept of self-complexity. To test this notion, scores of language-dependent self-representation and both, traditional and alternative, measures of self-complexity were included in a correlational analysis.

As depicted in Table 10, in the full sample both scores of language-dependent self-representation, compartmentalization along language lines (*CaLL*) and the proportion of traits in English (*PropEng*), were neither significantly related with the traditional self-complexity score (*SC*) nor the number of self-aspects (*NSA*) (*p*s > .19). There was however a significant correlation with the overlap measure (*OL*): *PropEng* and *OL* were strongly positively correlated, $r(26) = .66$, $p < .001$; *CaLL* and *OL* were strongly negatively correlated, $r(24) = -.59$, $p = .002$. With an increasing overlap among self-aspects, the proportion of traits used in English tended to increase and the extent of compartmentalization along language lines to decrease.

More importantly, in the subsample of 21 participants, the positive correlation between *PropEng* and *OL* remained strong and significant, $r(19) = .55$, $p = .009$. The correlation between *CaLL* and *OL* was no longer significant ($p = .09$). A significant negative correlation was found in the subsample between compartmentalization along language lines (*CaLL*) and the traditional measure of self-complexity (*SC*), $r(19) = -.55$, $p = .009$. The more participants reported a self that was compartmentalized along language lines the lower their self-complexity (as obtained by the traditional, disputed, self-complexity score).

Table 10 Summary of intercorrelations for measures of language-dependent self-representation, language proficiency and language use, and self-complexity

Measure	Language-Dependent Self-Representation		Language Proficiency and Language Use						Self-Complexity		
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1. Proportion of traits in English (*PropEng*)	—	-.02	-.17	-.23	-.15	-.08	-.15	.11	-.17	-.41	**.55****
Compartmentalization along Language Lines	-.38	—	.25	**.47***	.06	.25	.37	.13	**-.55****	-.24	-.37
English Language Proficiency	.01	.00	—	**.72*****	.23	.11	.31	-.02	.04	-.10	-.37
Norwegian Language Proficiency	-.15	.30	**.66*****	—	.23	**.54***	**.53***	-.02	-.03	-.11	-.29
Self-Rated English Language Proficiency	-.21	.18	.16	-.01	—	.20	.08	.10	**.43***	-.07	.14
Self-Rated Norwegian Language Proficiency	-.19	.32	-.03	**.38**$^{+}$	.29	—	.19	.23	.07	-.09	.12
English Language Use at School	-.11	.25	.16	**.44***	-.03	.27	—	-.05	-.05	.16	-.38
English Language Use at Home	.03	.16	.01	-.08	.26	.24	-.10	—	-.03	-.03	.28
Self-Complexity Score (*SC*)	-.22	-.27	-.07	-.09	.32	.11	-.03	-.02	—	**.56****	.23
Number of Self-Aspects (*NSA)*	-.25	-.15	-.13	-.24	.18	.05	.15	.06	**.59****	—	-.06
Overlap (*OL*)	**.66*****	**-.59****	-.06	-.08	-.17	-.13	-.29	.10	-.06	-.26	—

Note. Intercorrelations for the subsample of participants with a valid *CaLL* score (n = 21) are presented above the diagonal, and intercorrelations for the full sample (including participants with an artificial *CaLL* score of zero) (n = 26) are presented below the diagonal.

$^{+}$ p = .05, * p < .05, ** p < .01, *** p < .001

Discussion

In Study 3, we introduced a new method to explore language-dependent self-representation in people with everyday multiple language use. We anticipated that a bilingual trait sorting task in which participants were free to use traits in both of their languages for the description of different aspects of their self would reveal self-representations which are characterized by the fact that they contain self-knowledge that is represented in both languages. In fact, although participants were free to use traits in one language only, the majority of participants (80.8%) generated trait sorting results that contained traits in both languages.

Our assumption that language use would interact with the extent of traits in the same language was tested in participants who had created self-aspects referring to the school and the home context. The expected positive relation, however, was not observed. On the one hand, it is possible that the sample was simply too small to exhibit a significant effect. Especially regarding the fact that, on average, the number of traits used in English was 3.5 times higher than the number of traits used in Norwegian. It is thinkable that self-knowledge represented in English was more easily accessible, firstly because of the English language ambiance of the school and secondly because the instructions had been given in English. In future research, this effect could be circumvented by randomly assigning participants to instructions given in different languages. On the other hand, it is conceivable that the approach was not adequate: Participants were provided with traits in English and Norwegian to describe their self-aspects. Yet, most participants were fluent in other languages than English and Norwegian which they likely use when at home. Hence, testing the extent of traits in English is possibly not a suitable measure to investigate the relation between language use and language of self-representation.

In any case, a qualitative questionnaire could have been informative. Asking participants after working on the bilingual trait sorting task for their rationale in choosing the language(s) of the traits might have provided better insight and should be considered in future studies working with the bilingual trait sorting task to gain better insight and enable correlational analysis showing a relation between language use in a specific context and the extent to which traits in the respective language are used.

Beyond the descriptive analysis of the trait sorting results we, furthermore, developed measures to capture the extent to which participants use language as an organizing principle for their self-representation. The proportion of traits used in English and Compartmentalization along Language Lines did not simply reflect background variables of language proficiency and language use. Except for a positive relation between participants' C-Test performance in Norwegian and *CaLL*, no significant correlations between variables of language proficiency and language use were found.

Furthermore, we expected, that language-dependent self-representation offers an additional dimension in organizing self-knowledge that is independent from self-complexity. To check whether language-dependent self-representation is a concept independent from self-complexity, we examined the trait sorting results with regard to the traditional self-complexity score, and the more appropriate singular measures of self-complexity, i.e. number of self-aspects and overlap. Our findings showed that the Proportion of traits in English (*PropEng*) was not significantly correlated with the traditional Self-complexity score (*SC*) or the Number of Self-Aspects (*NSA*). Regarding Overlap (OL), correlational analysis revealed a relation between the overlap measure and the proportion of English traits (*PropEng*). Though not directly expected a priori, we want to argue that this relation makes sense, as the probability of overlap increases with a high proportion of traits in the same language. Thus, theoretically a U-curve should have been expected. In fact, a posteriori, we found that R^2 increased when a

quadratic function between *OL* and *PropEng* was expected in comparison to when a linear function was expected (R^2 linear = .31; R^2 cubic = .33).

Another unexpected finding was the relation between the traditional self-complexity score and compartmentalization along language lines. In the present sample, *SC* was negatively related to *CaLL*. This correlation suggests that self-complexity is counteracting language-based self-representation and remains to be tested in other samples. However, both alternative measures representing self-complexity, i.e. the Number of Self-Aspects (*NSA*) and Overlap (*OL*), were not significantly correlated with Compartmentalization along Language Lines (*CaLL*)

Taken together, in Study 3, we provide further evidence supporting our assumption of a language-dependent self-representation in people with everyday multiple language use. Language-dependent self-representation was captured quantitatively by two measures and confirmed qualitatively in terms of independent from language proficiency and language use. It remains to be tested how language-dependent self-representation interacts with self-complexity in another sample of people with everyday multiple language use.

Study 4. How language-dependent self-representation modulates affective response in individuals with everyday multiple language use. Revisiting the spill-over hypothesis[8]

The aim of Study 4 is to examine whether the extent to which people with everyday multiple language use employ their languages to organize their self-knowledge along language lines, i.e. feature a language-dependent self-representation, impacts on their affective response when receiving negative feedback. Based on the self-complexity affective extremity model (Linville, 1985) which suggests a relation between the complexity of self-representation and affective response (see chapter on The Complexity of the Self), we propose that language-dependent self-representation allows generating more distinct self-aspects and as a result hampers spill-over of negative affect among self-aspects. Hence, this study is designed to revisit the spill-over hypothesis in people with everyday multiple language use.

In our study, non-native English speaking participants received bogus feedback that ostensibly reflected their poor performance in an English language proficiency test on which they had been working previously. Assuming that in the English language ambiance of the study situation self-knowledge pertaining to English is predominantly activated, negative feedback - additionally targeting on the "self as English speaking" – was intended to manipulate evaluation and affect associated with currently activated contents of self-knowledge represented in English. We, however, were interested in how the negative

[8] This study was carried out as part of a project during a research stay at the Department of Psychology at The Norwegian University of Science and Technology (NTNU). The project has received support from the Research Council of Norway (project number: 227265/F11).

feedback impacted on participants' global self-evaluation and overall affective response, as we hypothesize language-dependent self-representation to moderate affective spill-over. To this end, we administered participants' self-esteem and mood. Measures of language-dependent self-representation had been obtained using the bilingual trait sorting task presented in Study 3. Relating the Proportion of traits in English (*PropEng*) and the extent to which participants' self was Compartmentalized along language lines (*CaLL*) to participants' affective response, in terms of self-esteem and mood, we expected to find the following moderating effects of language-dependent self-representation:

Regarding the first dependent variable, self-esteem, we expect language-dependent self-representation to moderate the impact self-threatening feedback has on self-esteem stability. More precisely, we expect participants with a self that is compartmentalized along language lines to a higher extent (*high CaLL*) to show more stable self-esteem than participants whose self is compartmentalized along language lines to a lower extent (*low CaLL*) or not at all (Hypothesis 1). To test this hypothesis, we assessed participants' self-esteem before and after receiving negative feedback. As a technique to assess participants' variation in self-esteem provoked by negative feedback manipulation we chose to administer the Name letter task. The Name letter task is an indirect measure of self-esteem that captures automatic, implicit evaluations of the self by simply asking participants to judge alphabet letters (Johnson, 1986; Nuttin, 1985, 1987). The idea behind that technique is that participants evaluate letters that they associate with themselves, i.e. their name letters, more positively than other letters (coined the Name Letter Effect, Hoorens & Nuttin, 1993; Nuttin, 1985). The Name letter task is a frequently used implicit measure of self-esteem (Buhrmester, Blanton, & Swann, 2011) and seemed especially suitable for our study design because it has been shown to allow repeated measurements, even with brief intervals (Hoorens, 2014), without participants being

aware of what is administered (Hoorens, 2014). Furthermore, the Name Letter Effect has been shown to be especially strong for initial letters (e.g., Kitayama & Karasawa, 1997; Koole, Dijksterhuis, & van Knippenberg, 2001; Nuttin, 1987). Findings from a recent study relating the preference for initials and non-initial name letters to direct measures of self-esteem suggest ratings of initials and ratings of non-initial name letters reflect different aspects of self-esteem: Initials, especially first name initials, were shown to be indicative of state self-esteem, while ratings of other name letters were primarily associated with measures of trait self-esteem (Hoorens, Takano, Franck, Roberts, & Raes, 2015). Hence, being interested in the affective response provoked by the negative feedback manipulation, i.e. short-lived changes in self-esteem, we used ratings of first name initials.

Moreover, assessing participants' mood after receiving negative feedback, as the second dependent variable, we expect that language-dependent self-representation moderates the impact of the self-threatening experience on mood. More precisely, we expected that a higher proportion of traits in English would allow more spill-over of negative affect, hence have a negative effect on participants' mood, whereas a higher compartmentalization along language lines would act as a cognitive buffer and hamper affective spill-over, thus have a positive effect on participants' mood after receiving negative feedback (Hypothesis 2).

As a secondary objective, this study seeks to investigate the association between measures of language-dependent self-representation and self-complexity. In Study 3 we found *SC* and *CaLL* to be negatively related. In Study 4, we test whether this relation is replicated in a bigger sample and investigate further possible relations among measures of language-dependent self-representation and self-complexity.

To summarize, in Study 4, we revisit the spill-over hypothesis in people with everyday multiple language use proposing that language-dependent self-representation offers a potential cognitive buffer against affective spill-over.

Method

The present study was conducted in Norway. International students were approached by study invitations distributed at the university campus and posted on social network websites. The study was supposedly interested in how living in Norway influences the way people think and feel about themselves. As a requirement for participation students had to be non-native English speaking and have daily interactions in English. In addition, study invitations informed that participation was voluntary and anonymous and compensated for with vouchers for the cafeteria or the movies.

Participants

Seventy international students (42 female, 28 male) between 18 and 36 years of age (M = 23.93, SD = 3.64) who assessed themselves as non-native but proficient English-speaking with daily interactions in English signed up for the study. Participants studied diverse subjects, most on Bachelor or Master level (27.1 % and 48.6% respectively) and the minority on Ph.D. and PostDoc level (4.3% each) (15.7% with missing information on study level). Participants were from a variety of nationalities. Main first languages were German (28.6%), Spanish (12.9%), Dutch (11.4%), and French (10.0%).

Materials and Measures

Bilingual Trait Sorting Task. We administered the bilingual trait sorting task (see Study 3 for a detailed explanation). In the present study, participants received a customized deck of trait cards containing traits in English on one side and traits in their first language (L1) on the other side. In the run-up of the study, translations of the traits had been obtained for Dutch, French, German, Italian, Norwegian, Spanish, and Swedish with the help of native speakers[9] (see Appendix A for the complete list of traits and translations). For participants where we had not been prepared to provide translations into their first languages (L1: Czech, Korean, Nepali, Portuguese, Serbian, Slovak, Slovenian, Urdu; n = 17) trait cards contained the original English traits on the one side and, and except for the small index numbers, were blank on the other side. These participants were instructed to translate each trait into their first language and to write the translation down on the blank side of the cards before starting their self-description according to the instructions.

Participants on average created 5.73 self-aspects (SD = 2.25, *Range* = 2 - 13), with no significant difference between participants working with ready-made traits cards (M = 5.79; SD = 2.23, n = 53) and those who had to translate traits themselves (M = 5.53; SD = 2.35, n = 17), $t(68) = 0.42$, $p = .68$. Participants working with ready-made trait cards on average used one trait less to describe each of their self-aspects (M = 5.43; SD = 2.57) than participants who had to translate traits themselves (M = 6.43; SD = 2.88); which showed to be a significant difference $t(410) = 3.13$, $p = .002$. A chi square test comparing the amount of traits

[9] For each language, first, one native speaker translated the original English trait list into the respective language, which was then independently back-translated by a second native speaker of the same language. In cases where translators struggled to decide for one translation or back-translations were not consistent the translation that was more common or used more frequently in the respective language was chosen.

used in English and in the first languages (L1) for self-description in participants who worked with ready-made trait cards and participants who had to translate traits themselves revealed a significant effect, $\chi^2(1, N = 2301) = 74.86$, $p < .001$. Participants working with ready-made trait cards were more likely using traits in their L1 (67%) than participants who had to translate traits into their L1 themselves (47%).

C-Test. Participants' proficiency in English was captured by self-constructed C-tests. Two text passages about the European Union (EU) were transformed into C-tests by removing the second part of every second word beginning with the second sentence (Klein-Braley, 1985). C-test Version 1 about the History of the EU included 40 gaps, C-Test Version 2 about the Nobel Peace Prize included 46 gaps. Appendix B presents both C-test versions. Participants were randomly assigned to one C-Test version and instructed to fill out as many correct missing syllables as possible within four minutes. Individual English proficiency scores were calculated as the percentage of correctly answered gaps. Although C-Test versions differed in the number of gaps, analysis revealed that there was no significant difference in the proficiency scores between participants working on Version 1 ($M = 49.39$, $SD = 22.68$) and participants assigned to working on Version 2 ($M = 53.83$, $SD = 17.12$), $t(68) = 0.93$, $p = .36$.

Feedback Manipulation. Supposedly reflecting their performance in the English language proficiency test participants received negative bogus feedback reading: "*Your performance was in the bottom 10% of those taking the test. Out of a possible score of 50 points, you have received 21 points. You are in the 93rd percentile of the population; that means 9/10 of the population have a higher English potential than you.*"

Rosenberg Self-Esteem Scale (RSES). The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was administered to measure participants' explicit self-esteem. The scale consists of ten

items directly asking participants for evaluations of themselves (sample item: “I feel that I have a number of good qualities”) with answer options being 1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, and 4 = *strongly disagree*.

Letter Rating Task. A letter rating task (Johnson, 1986; Nuttin, 1985) was implemented to measure participants’ implicit self-esteem. The instructions asked participants for how much they liked each letter of the Norwegian alphabet (A to Å) which they indicated on visual analog scales ranging from *not at all* (0) to *a lot* (101), with the extremes additionally illustrated with thumbs down/thumbs up symbols (see example item in Figure 7).

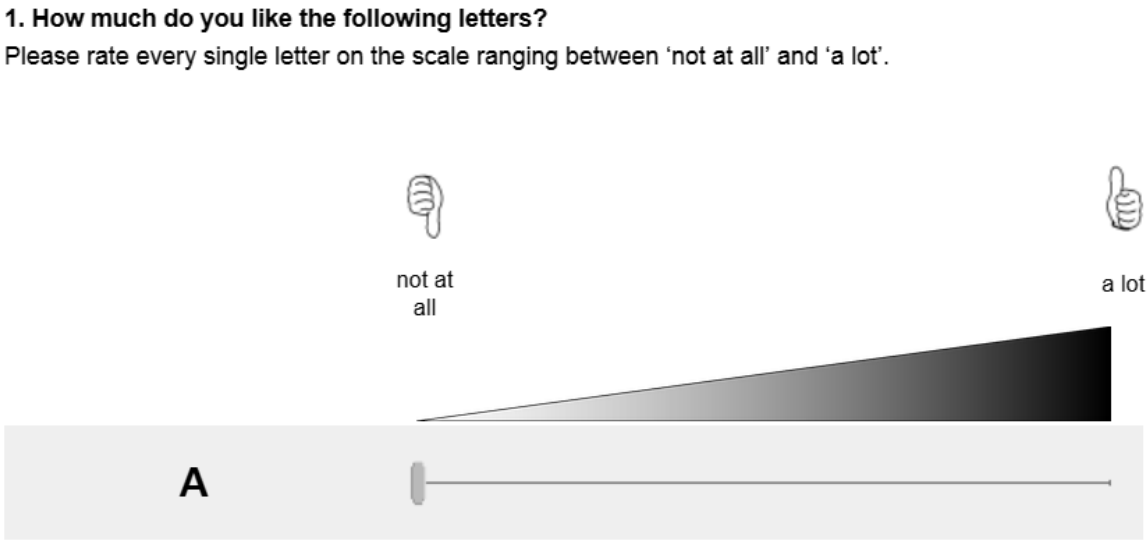

Figure 7 Example item (“A”) of the letter rating task

Language and Social Background Questionnaire (LSBQ). A shortened version of the Language and Social Background Questionnaire (Luk & Bialystok, 2013) was employed to assess participants’ background variables regarding demographics and English language use. The reported age of English language acquisition ranged from 4 to 16 years (M = 9.54, SD = 2.52, *Mode* = 10). All but one participant reported having learned English in school. Most

participants reported English as the language in which they are second most fluent (eight participants as their third most fluent language, one as the fourth most fluent language). On average, participants evaluated their fluency in English in comparison to native speakers (assessed via single items for speaking, understanding, reading, and writing, with visual analog scales ranging from *no proficiency* (0) to *fully fluent* (101)) as quite high (Cronbach's $\alpha = .92$, $M = 66.75$, $SD = 19.59$, $N = 70$).

Mood Scale. Participants were asked to indicate their mood on a single item reading "How is your mood today?". The item was presented together with a visual analog scale where the extremes were labeled *bad* (0) and *good* (101) and visually illustrated with thumbs down/thumbs up symbols. Forty-one participants answered on this item ($M = 64.68$, $SD = 24.23$).

Procedure

The study took place in the university laboratory where sessions were conducted in groups of maximal eight participants. Participants were individually seated at computer desks and informed that the study consisted of a self-description task and a web-based questionnaire.

In the first part of the study, the *self-description part*, participants worked on the bilingual trait sorting task. Participants were given trait cards containing the particular language combination and recording sheets. On top of the recording sheets, participants were asked to generate a participant code from the first letter of their first name, the first letter of their family name, and the last three digits of their mobile phone number. The instructions for the bilingual trait sorting task were read out aloud in English (see Appendix A) and participants started their self-description which was then captured on the recording sheets.

Immediately following, participants switched to the computer screen and continued with the web-based *questionnaire part.* First, participants gave their consent that the study may entail deceptive content and that they can only be fully informed about the study after completion. Allegedly to match participants' questionnaire answers with the appropriate recording sheets, participants then had to generate the participant code consisting of their initials letters and the last three digits of their mobile phone number. Without participants' notice, initial letters were additionally selected for programming a customized letter rating task. Participants answered on the RSES and worked on one of two C-test versions labeled as a "Fill in the gaps" - task to measure English language proficiency. After four minutes a pop-up window, saying "Time is up", appeared and participants were forwarded to the next page presenting the letter rating task. Participants were informed that they would be presented all letters of the alphabet in random order and instructed to rate each letter. When participants had rated about half of the letters of the Norwegian alphabet, a pop-window appeared and informed participants that their performance results from the English language proficiency test were available. Participants were then forwarded to a page labeled "Performance Feedback" and received the *negative bogus feedback*. After reading the feedback manipulation, participants continued with the task at hand which had seemingly been interrupted by the performance feedback and rated the rest of letters of the Norwegian alphabet which were presented in random order. What participants did not know, was that a self-programmed code had randomly divided the letters of the alphabet into two blocks, with both blocks containing the respective participant's first and last name initial letters, which were derived from the code the participant had generated at the beginning of the questionnaire. Hence, the liking of initial letters was assessed prior to the feedback manipulation and after participants had received negative bogus feedback. Participants completed the RSES a second time, answered questions on demographics, language use and

their reasons for staying in Norway. Finally, participants were asked about their current mood. At the end of the web-based questionnaire, participants were debriefed and apologized for the deception. They were asked to leave a comment on the study if they wished to and thanked for their participation.

Data Preparation

Measures of Language-Dependent Self-Representation and Self-Complexity

As a first step of the data analyses recording sheets from the bilingual trait sorting task were inspected.[10] Table 11 displays the trait sorting result from a participant with L1 German with index numbers being replaced by the appropriate traits. Based on each participant's trait sorting result individual scores were calculated to describe content and structure of self-representation. A detailed procedure to obtain all measures of language-dependent self-representation and self-complexity can be found in the Appendix A of this dissertation.

[10] One participant's trait sorting result attracted attention because this participant had recorded index numbers pertaining to both sides of each trait card he had sorted in any of his self-aspects. As this participant also commented on the study that the instructions for the trait sorting task should be given in written form it seemed appropriate to exclude this participant from the analyses. The recording of each trait in both languages did not seem to reflect a meaningful selection but was rather ascribed to the fact that the participant had not understood the instructions. This participant had to translate traits into his first language first.

Table 11 Sample recording sheet

Familie / enge Freunde	Partnerschaft	Work	being by myself	meeting new people
impulsive	Affective	fleißig	nachdenklich	Quiet
entspannt	weichherzig	anspruchsvoll	organized	reserved
durchsetzungsfähig	liebevoll	competitive		insecure
humorvoll	mature	arbeitsam		
	anspruchsvoll			
	impulsive			
	entspannt			

Note. *PropEng* = .45, *CaLL* = .50, *SC* = 1.52, *NSA* = 5, *OL* = .05

Proportion of traits in English (PropEng). On average the proportion of traits used in English was lower (M = .39, SD = .35, N = 69) than the proportion of traits used in the L1. The difference between participants working with ready-made trait cards (M = .36, SD = .32, n = 53) and participants who had to translate traits themselves (M = .50, SD = .43, n = 16) was not significant, $t(67) = -1.40$, $p = .16$. Fifteen participants (21.7%) had used traits in their first language only, whereas nine participants (13.0%) had used traits in English only. A chi-square analysis was calculated comparing the frequency of using traits in either English only, in the L1 only, or in both languages in participants working with ready-made traits cards and participants translating traits into the L1 themselves and revealed a significant effect, $\chi^2(2, N = 69) = 8.61$, $p = .01$. Participants who had to translate traits into their L1 themselves were more likely to only use traits in the first language (31.3%) or traits in English (31.3%) than participants who were provided with ready-made trait cards (18.9% and 7.5% respectively). Forty-five participants, including 39 participants who had been working with ready-made trait cards and six participants who translated traits themselves, had used traits in both languages. In this subsample, the proportion of traits used in English on average was M = .40 (SD =.25).

Compartmentalization along Language Lines (CaLL). In the subsample of 45 participants who had used traits in both their L1 and in English *CaLL* scores ranged from .10 to 1.00 (the maximum pertaining to one participant who had created a sort that was perfectly compartmentalized along language lines) (M = .43, SD = .19). The difference between participants working with ready-made trait cards (M = .44, SD = .18, n = 39) and participants who had to translate traits themselves (M = .36, SD = .18, n = 6) was not significant, $t(43) = 1.06$, $p = .30$.

Self-complexity (SC). The maximum possible value of the *SC* score in the present study was $\log_2 66 = 6.04$. The actual range of self-complexity scores (*SC*) was from 0.85 to 2.96 (M = 1.88 , SD = 0.53). The difference between participants working with ready-made trait cards (M = 1.87, SD = 0.51, n = 53) and participants who had to translate traits themselves (M = 1.92, SD = 0.61, n = 16) was not significant, $t(67) = -.29$, $p = .78$.

***Number of self-aspects* (*NSA*).** On average the number of self-aspects (*NSA*) was 5.75 (SD = 2.25). As reported above, participants working with ready-made trait cards (M = 5.79, SD = 2.24, n = 53) did not significantly differ from participants who had to translate traits themselves (M = 5.63, SD = 2.39, n = 16) in the number of self-aspects, $t(67) = .26$, $p = .80$.

Overlap (OL). The obtained *OL* scores in the present sample ranged from .00 to .77 - with a small score indicating no or little overlap and larger scores indicating relatively more overlap among the self-aspects (M = .14, SD = .15). There was no significant difference between participants working with ready-made trait cards (M = .14, SD = .15, n = 53) and participants who had to translate traits themselves (M = .16, SD = .17, n = 16), $t(67) = -.61$, $p = .54$.

As displayed in Table 12, correlational analyses revealed no significant correlation between the proportion of traits used in English and the extent to which self-aspects were compartmentalized along language lines (p = .97).

Furthermore, the proportion of traits used in English was neither significantly related to the traditional self-complexity score nor to any alternative score representing self-complexity, i.e. number of self-aspects and the overlap between self-aspects or (ps > .39).

Compartmentalization along language lines was not significantly related to the self-complexity score and to the number of self-aspects (ps > .38). However, regarding the overlap component, there was a significant negative correlation between *CaLL* and *OL* (p = .01) suggesting that the more participants' self was compartmentalized along language lines the less participants had used the same traits for the description of different self-aspects (see Table 12).

Table 12 also displays intercorrelations of Linville's self-complexity measure and the alternative measures reflecting the two components of self-complexity. Intercorrelations show significant positive relations of *SC* with *NSA* and *OL*, the more self-aspects the higher SC. Interestingly, the more *OL* the higher *SC*. *NSA* and *OL* were not significantly related.

Table 12 Intercorrelations among measures of language-dependent self-representation and self-complexity (n = 45)

	Language –Dependent Self-Representation		Self-Complexity		
Measure	*1*	*2*	*3*	*4*	*5*
1. *PropEng*	-				
2. *CaLL*	-.09	-			
3. *SC*	-.02	.07	-		
4. *NSA*	.11	.21	**.69*** **	-	
5. *OL*	.00	**-.38***	**.48****	.20	-

Note. *PropEng* = Proportion of traits in English; *CaLL* = Compartmentalization along Language Lines; *SC* = traditional self-complexity measure; *NSA* = number of self-aspects; *OL* = overlap.

* $p < .05$, ** $p < .01$, *** $p < .001$

English language proficiency. Every participant received a score reflecting their English language proficiency according to the percentage of correctly answered gaps in the C-test (M = 49.39, SD = 22.68, n = 33 for Version 1; M = 53.74, SD = 17.36, n = 36 for Version 2). Analysis revealed that nine participants had answered correctly on less than 25% of gaps (Version 1: n = 6, Version 2: n = 3). We decided to exclude these participants from further analyses as it was not certain that their English proficiency was sufficient to adequately work on the tasks.

Explicit self-esteem. Participants' levels of explicit self-esteem had been obtained prior to receiving negative feedback and after the feedback manipulation for reasons of manipulation check. To investigate the variation in participants' levels of explicit self-esteem the full RSE scale had been assessed twice. Negatively poled items were reversed and a sum score calculated for pre-feedback explicit self-esteem (Cronbach's α = .83, RSE_{pre}: M = 30.85, SD = 4.60, n = 60) and post-feedback explicit self-esteem (Cronbach's α = .87, RSE_{post}: M = 29.85, SD = 5.21, n = 60). A repeated measures ANOVA showed that there was a significant

change in participants' level of explicit self-esteem, $F(1, 59) = 14.87$, $p < .001$. As was the intention of the study design involving negative bogus feedback, participants' explicit self-esteem decreased.

Implicit self-esteem. To obtain measures on implicit self-esteem each participant's evaluation of letters in the letter rating task was analyzed. Participants had rated alphabet letters before receiving negative feedback and after receiving negative feedback. A repeated measures ANOVA revealed that participants' letter ratings were not significantly influenced by the interrupting feedback manipulation that appeared between Block 1 and Block 2 of randomly selected letters, $F(1, 59) < 1$, $p = .62$ (Block 1: $M = 53.78$, $SD = 11.70$, $n = 60$; Block 2: $M = 53.04$, $SD = 13.24$, $n = 60$). The main interest, however, was on the Name Letter Effect (*NLE*), more precisely the variation in participants' liking of their initial letters which had been included in both blocks. Researchers have suggested different algorithms for correcting the Name Letter Effect from unintentional biases, e.g. letter frequency, general letter liking et cetera (Hoorens, 2014). However, as the key focus of the analysis is the variation of initial liking within participants which intentionally was manipulated via negative bogus feedback it seemed advantageous to abstain from any algorithm and employ the raw score of the *NLE* in this study. Accordingly, we operationalize implicit self-esteem (*ISE*) as participant's average liking of their first name initial letter and last name initial letter minus the scale midpoint (suggestion by Hoorens (2014)). Within participants, a higher score displays a relatively higher level of implicit self-esteem. In the present sample, the resulting scores for implicit self-esteem ranged from -29.50 to the maximum of 50.00 before receiving feedback (ISE_{pre}: $M = 20.81$, $SD = 18.58$) and from -18.50 to the maximum of 50.00 after receiving feedback (ISE_{post}: $M = 20.64$, $SD = 18.96$).

Results

Variation in Self-Esteem

Our first hypothesis reads that language-dependent self-representation moderates the affective response towards self-threatening feedback in terms of self-esteem stability. To examine our hypothesis whether language-dependent self-representation buffers the impact of negative feedback on self-esteem a repeated measures ANOVA was conducted with implicit self-esteem as the repeated factor. As the between group factor, we categorized participants according to their extent of using language as an organizing principle.

Participants were categorized into four groups according to their scores on language-dependent self-representation, i.e. the extent to which language was used as an organizing principle for their self-knowledge. Participants who had used traits in one language only, and as a consequence did not obtain a *CaLL* score, were categorized as '*all L1*' if they had used traits in their first language only (n = 13) and as '*all L2*' if they had used traits in English only (n = 8). For participants who had used traits in their L1 and in English, a median split on the *CaLL* score was conducted and participants categorized as either *'low CaLL'* or *'high CaLL'*. Participants whose *CaLL* score was lower than .41 were included in the *'low CaLL'* group (n = 19). Participants whose *CaLL* score was .41 or above were classified as *'high CaLL'* group (n = 20). The mean *CaLL* score proofed to be significantly lower in the *'low CaLL'* group than in the *'high CaLL'* group, $t(24.38) = -6.07$, $p < .001$.

We expected that the variation in self-esteem is moderated by the extent of language-dependent self-representation. Assuming that in the English ambiance of the test situation participants' self-knowledge pertaining to English would be activated, we expected negative bogus feedback about English language performance to affect the activated self-aspect and spill-over to other self-aspects to the extent that the self was represented in English and

compartmentalized along language lines. More specifically, regarding participants who had described themselves using traits in one language only it was expected that participants who had used traits in English only would be affected most strongly by the negative feedback and show a strong decrease in self-esteem while participants who used traits in their L1 only to describe themselves were expected to tolerate negative bogus feedback in English without strong effects for their self-esteem.

Moreover, we expected that variation in the *low CaLL* group would be stronger than in the *high CaLL* - where affective spill-over is more likely to occur. More, specifically participants with a strong tendency to organize self-knowledge along language lines, i.e. high compartmentalization along language lines, should profit from a strong buffering effect resulting in less variation in self-esteem, participants with a weak tendency to use language as an organizing principle of self-knowledge, i.e. low compartmentalization along language lines, were expected to show a greater spill-over effect and suffer more from negative feedback.

Upon testing our hypothesis, we checked for group differences. Table 13 shows a summary of the characteristics of the four different groups with respect to participants' age, age at onset of English, self-reported fluency in English, and English language proficiency as obtained by their C-test performance. Separate ANOVAs on these variables did not reveal any significant differences between the groups that might contribute to an explanation of the differences in the extent to which participants compartmentalized along language lines (see Table 13). Post hoc analyses also did not reveal any significant differences in pairwise comparisons. Table 13 also presents the groups' characteristics pertaining to their self-representation. Unless significant differences in *PropEng* between the *allL1* and *allL2* group, there were no significant differences in scores reflecting self-complexity.

Having seized that the groups did not differ with regard to background variables we conducted repeated measures ANOVA. A 2 (ISE_{pre} *vs.* ISE_{post}) by 4 (compartmentalization groups) mixed ANOVA on implicit self-esteem as the repeated factor revealed that the main effect of the variation in implicit self-esteem was not significant, $F(1, 56) = .36$, $p = .55$. More importantly, however, there was a significant interaction effect between the variation in implicit self-esteem and the compartmentalization groups, $F(3, 56) = 4.32$, $p = .008$, $r = .27$. This indicates that the variation in implicit self-esteem before and after feedback differed across *CaLL* groups.

The interaction graphs (see Figure 8)[11] suggest that the groups who were most affected were the *'all L1'* and *'low CaLL'* groups, with the former showing a decrease in implicit self-esteem and the latter an increase in implicit self-esteem over time. The *'all L2'* group, as well as the '*high CaLL*', seemed far less affected by the negative bogus feedback, yet the plot indicates a slight decrease for the former and a slight increase in self-esteem over time for the latter.

[11] Note that the varying group mean level cannot be meaningfully interpreted as they reflect the raw score of initials liking pertaining to different letters without any baseline corrections.

Table 13 Summary of CaLL group characteristics and measures of self-representation

					Compartmentalization along Language Lines					
	all L1 (n = 13)		*all L2* (n = 8)		*low CaLL* (n = 19)		*high CaLL* (n = 20)			
female	9		4		13		10			
male	4		4		6		10			
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F(3,56)*	*p*
Participants' age	23.38	3.43	22.25	2.32	24.37	3.18	23.60	4.31	1.64	.19
Age at onset of English	8.38	2.53	10.00	2.39	9.84	2.32	8.80	2.24	2.04	.12
fluency in English (self-reported)	60.08	24.74	74.91	10.36	65.96	21.19	71.33	13.93	1.40	.25
English language proficiency (C-test score)	-.35	.80	.32	1.12	-.03	1.05	.13	1.00	0.93	.43
Proportion of traits in English (*PropEng*)	.00	.00	100.00	.00					36.86	.00
					41.24	29.32	40.13	22.55	t(37) = .13	.90
Self-Complexity (*SC*)	1.84	0.55	1.68	0.57	2.03	0.49	1.91	0.50	< 1	
Number of Self-Aspects (*NSA*)	6.00	2.92	4.50	1.69	6.05	2.48	6.30	1.75	1.25	.30
Overlap (*OL*)	.21	.23	.10	.13	.18	.13	.08	.10	2.50	.07

Separate repeated measures ANOVAs for all groups revealed that the variation was significant in the '*all L1*' group, $F(1, 12) = 8.84$, $p = .01$ and in the *'low CaLL'* group, $F(1, 18) = 4.74$, $p = .04$, but not in the '*all L2*' and *'high CaLL'* groups ($ps > .66$). As expected, the *'high CaLL'* group showed to be less affected by negative feedback in terms of self-esteem variation than the *'low CaLL'* group. However, the '*low CaLL'* group showed to increase in implicit self-esteem despite the negative feedback. In fact, estimating slopes for the regression of implicit self-esteem scores post-manipulation on implicit self-esteem scores pre-manipulation as a function of compartmentalization along language lines (Aiken & West, 1991) shows that for '*low Call*' the association was stronger ($\beta = .91$, $SE = .11$) than for *'high CaLL'* ($\beta = .87$, $SE = .12$). However, the difference between the simple slopes being non-significant, $t(60) = 0.91$, $p = .37$.

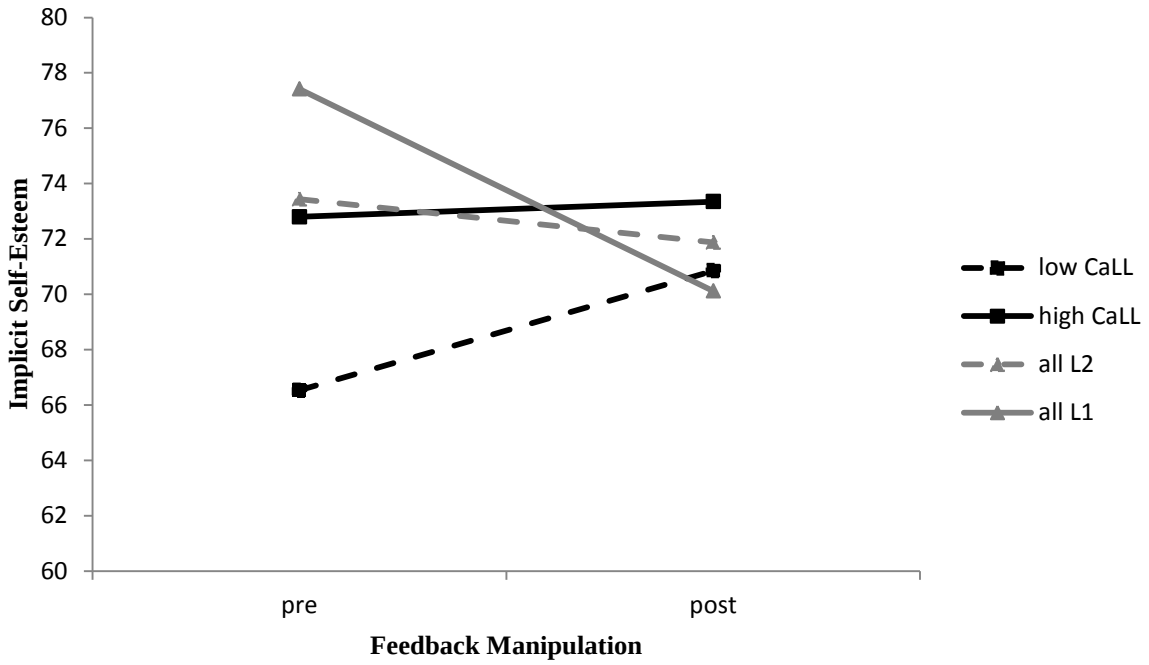

Figure 8 Interaction plot of the repeated measures ANOVA of implicit self-esteem pre and post feedback manipulation by compartmentalization groups

Mood

As our second hypothesis, we expected that the extent of language-dependent self-representation, in terms of Proportion of traits in English and Compartmentalization along Language Lines, would moderate participants' mood after having received negative feedback.

Analysis of group means showed that on average '*all L1'* (M = 73.40, SD = 16.70) scored higher on mood than '*all L2'* (M = 47.40, SD = 22.03), and '*low CaLL'* (M = 59.36, SD = 26.02) scored lower than '*high CaLL'* (M = 70.83, SD = 25.46). An ANOVA conducted with mood as the dependent variable and the four compartmentalization groups as the independent variable however did not reveal significant differences between the groups, $F(3, 37) = 1.88$, $p = .15$. Post hoc tests also were not significant ($ps > .26$).

However, treating measures of language-dependent self-representation (*PropEng* and *CaLL*) as continuous variables and performing regression analysis revealed significant effects. In the full sample, *PropEng* served as a significant predictor (see Table 14).

Performing regression analysis with the reduced sample (n = 25) comprising participants from the *'low CaLL'* and *'high CaLL'* groups who had answered on the mood item showed a significant negative effect of *PropEng* and a positive effect of *CaLL* as a continuous variable on mood. As expected, we found contrary effects for the extent to which participants described themselves with English traits and compartmentalization along language lines. The higher the proportion of traits in English used for their self-description in the bilingual trait sorting task the less positive was participants' mood after having received negative feedback in English about their proficiency in English. In contrast, the higher the compartmentalization along language lines the more positive was participants' mood. Table 14 presents the resulting coefficients.

Table 14 Hierarchical regression to predict participants' mood from their extent of language-dependent self-representation

	N = 41			*CaLL* (*n* = 26)		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Constant	76.43	5.09		83.36	9.56	
PropEng	-.32	.10	-.45**	-.48	.21	-.42*
		R^2 = .20			R^2 = .17	
Step 2						
Constant				58.41	14.81	
PropEng				-.44	.20	-.38*
CaLL				55.02	26.04	.37*
				ΔR^2 = .13 (p = .046)		

Note. PropEng = Proportion of traits in English, *CaLL* = Compartmentalization along Language Lines

* $p < .05$, ** $p < .01$

Discussion

Study 4 was designed to test whether language-dependent self-representation modulates the effect of negative feedback on self-esteem and mood. Using the bilingual trait sorting task we introduced in Study 3, we assessed language-dependent self-representation in international university students with everyday multiple language use.

In our analysis, we related *PropEng* and *CaLL* scores to variation in implicit self-esteem and participants' mood to investigate our assumption that a language-dependent self-representation hampers the spill-over of negative affect. We expected that the extent to which participants' self is organized language-based hampers the spill-over of negative affect between self-aspects. Overall, results confirmed our main hypotheses and documented a moderating effect of language-dependent self-representation on participants' affective response following negative feedback.

To test our hypothesis, we differentiated between participants who had shown a stronger tendency to organize self-knowledge along language lines (‘*High CaLL*’), participants who had shown a weaker tendency to organize self-knowledge along language lines (‘*Low CaLL’*), and participants who had used traits in English only (‘*all L2’*) or in the other language only (‘*all L1’*). Our findings showed that, as expected, implicit self-esteem of participants in the ‘*High CaLL*’ group was less affected by the negative bogus feedback than participants’ self-esteem in the ‘*Low CaLL*’ group. Different than expected, however, those who had a lower tendency to organize self-knowledge along language lines increased in implicit self-esteem after receiving negative bogus feedback. Participants who had used traits in only one language decreased in implicit self-esteem after receiving negative bogus feedback, irrespective of whether they had used traits in English only (‘*all L2’*) or traits in their other language only (‘*all L1’*) for describing themselves.

These results can be interpreted as showing that employing language as an organizing principle for the organization of self-knowledge to a high extent serves as a buffer hindering the spill-over of negative affect whereas using this organizing principle to a low extent modulates the activation of self-aspects but hinders the spill-over of negative affect.

To test our second hypothesis, that language-dependent self-representation would moderate the effect of the negative feedback on participants’ mood, participants’ mood was assessed at the end of the questionnaire. We expected, that participants’ mood would be especially low when *PropEng* was high and *CaLL* was low. Group means (though differences were not statistically significant) showed to be in line with our expectancies. *‘High CaLL’* reported a more positive mood than *‘low CaLL’*, and *‘all L1’* more positive than *‘all L2’*. However, these differences were not statistically significant. Using *PropEng* and *CaLL* as continuous variables showed the expected pattern: Participants whose *PropEng* was high and *CaLL* low were most strongly affected by the negative feedback regarding their mood.

Moreover, analysis of the scores obtained with the bilingual trait sorting task showed to be comparable to those obtained in Study 3.

Taken together, our findings provide evidence for the idea that using multiple languages in everyday life provides an additional dimension for organizing self-knowledge. Organizing self-knowledge along language lines hampers spill-over of negative affect with positive consequences for emotion and mood.

Study 5. How language-dependent self-representation can help buffering emotional-motivational loss

Based on the assumption that everyday multiple language use leads to a language-dependent, more complex, representation of self-knowledge, the main aim of Study 5 was to examine whether individuals with everyday multiple language use profit from their language-dependent self-representation in self-esteem threatening situations.

In line with the assumption that (bicultural) bilinguals shift between different cultural frames according to the language context (e.g., Benet-Martínez et al., 2002; Verkuyten & Pouliasi, 2002), we assume that bilinguals can switch between different *language selves*, in terms of different configurations of language-dependent self-aspects which are loaded into the working self (Hannover, 1997), subject to the language context. As a person's different self-aspects are sources of their overall affect and self-esteem (Linville, 1985), we assume that a language-dependent activation of self-aspects in bilinguals provokes different levels of affect and self-esteem associated with their different *language selves*. Therefore we assume that bilinguals profit from their language-dependent self-representation in self-esteem threatening situations as they can buffer self-esteem threats by shifting to their other *language self*.

In Study 5, we test our assumptions in an online study with participants with everyday multiple language use, one of which had to be German. Participants worked on a German language proficiency test and were given bogus feedback that their proficiency in the German language was either low or high. Following the feedback, participants were either given a self-description task (Kuhn & McPartland's (1954) Twenty Statement Test, TST) that they had to complete in German or their other language or continued without describing themselves (2 (Feedback Manipulation: negative vs. positive feedback) x 3 (Self-Description

Task: TST in other language vs. TST in German vs. no TST) between-participants experimental design). Afterward, participants answered on self-esteem measures and reported their motivation to work on a second German language proficiency test which followed.

Following our assumption that self-knowledge is represented and activated language-dependently, our hypothesis read that individuals who receive negative feedback relating to their German language proficiency profit from activating their other language self by describing themselves using their other language, in comparison to individuals who described themselves in German and accordingly did not temporarily shift into another language self. For participants who received positive feedback on their German language proficiency, we expect it to be irrelevant whether participants have to describe themselves in the same or the other language as in which the feedback was given. Concerning the condition in which participants did not work on a self-description task following negative or positive feedback, no specific prediction is made. We test our hypothesis with regard to four dependent variables: explicit self-esteem, implicit self-esteem, motivation, and performance. Regarding explicit self-esteem, which was assessed using the state self-esteem scale, we expected that participants accessing self-knowledge in their other language would show higher levels than participants who were not led to describe themselves in German. For implicit self-esteem, which was assessed using the name letter task (so to speak “language free”), we expected to find the same pattern of results as for explicit self-esteem. However, as the NLT is language free, we expected to find stronger differences. Adapting the notion that self-complexity is linked with different coping (Dixon & Baumeister, 1991), regarding participants’ motivation, we expected that participants who access self-knowledge in the other language after receiving negative feedback are more motivated to work on a second language-proficiency task than participants who accessed self-knowledge in the same language as the negative feedback was

given. Accordingly, we expected participants describing themselves in the other language after receiving negative feedback, to show better performance in the second language proficiency task than participants who described themselves in German.

Method

The study was conducted as an online-based experiment via the online tool soscisurvey. Potential participants, using multiple languages in everyday life - one of which had to be German, were advised of the online questionnaire by flyers distributed on campus, posts on social network sites and email lists of international groups. Furthermore, participants were invited to direct the link to any potential participant among their family and friends (snowball effect). To motivate participants they were informed that they would be included in a lottery for three gift cards from amazon.de over 20 Euros if they wished to (included leaving the email address afterward).

Participants

One hundred and eighty-one participants (59 male, 119 female, 3 not indicated) between the age of 13 and 61 years (M = 30.89, SD = 11.94) completed the online questionnaire. Participants' level of formal education in general was quite high: 45.9 % (n = 83) held a university degree, 19.9% (n = 36) a university-entrance diploma, and 17.7% (n = 32) of participants indicated that they were still at school. Of the sample, 45.3% (n = 82) reported to use *German and one other language* in their everyday life, 38.7% (n = 70) reported to use *German and two other languages* in their everyday life and 16.0% (n = 29) reported to use *German and three or more other languages* in their everyday life. Asked for the language they used most often in everyday life besides German, participants named 28 different

languages altogether; English (n = 70), and Spanish (n = 26) were named most often. Further, Turkish (n = 12), Japanese (n = 11), and French (n = 10) were among those named by ten participants or more. Regarding the age of acquisition of German, 52.5 % (n = 95) of participants reported that they had learned German from birth, for the remaining sample mean age of onset of German was 11.95 years (SD = 8.60, n = 86). Regarding the age of acquisition of the other language, 49.2 % (n = 89) of participants reported that they had learned the other language from birth, for the remaining sample mean age of onset of the other language was 12.77 years (SD = 7.36, n = 92). Twenty-seven participants (14.9%) reported that they had learned both German and the other language from birth. Reasons for everyday use of the other language were most often attributed to family, friends, and occupation (for 64.6%, 53.6%, and 51.9% of the sample, respectively).

Procedure

On entering the online questionnaire, participants were welcomed to the study and were informed that their data would be treated confidentially and for scientific research only. After participants agreed on these conditions the questionnaire began on which participants worked at their own pace (except for the C-tests which were timed for three minutes). First participants worked on a C-Test. Following the C-Test, participants received bogus feedback on their performance. Subsequently, participants worked on an open self-description task or were directly forwarded to scales measuring self-esteem and questions regarding their motivation to work on a second C-Test which followed. After participants had provided all necessary demographic information participants were debriefed and thanked for their participation.

Research Design

The study was based on a 2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Treatment: TST in other language vs. TST in German vs. no TST) between-subjects design. The "no TST" condition receiving negative or positive feedback served as a control condition. Participants were randomly assigned to one of these six experimental conditions. A code written by the author ensured that the samples within the different conditions were comparable in their proficiency in German as obtained from the first C-Test. A priori power analysis indicated that 30 participants in each of the experimental groups was necessary to have 80% power for detecting a medium sized effect when employing the traditional .05 criterion of statistical significance.

Materials and Manipulations

German language proficiency. Participants' German language proficiency was administered using a self-constructed C-test consisting of a short text in German on the *History of the European Union,* where beginning with the second sentence the second half of every second word had been removed. Participants' task was to fill in these 41 gaps (see Appendix B). Across participants, on average, 25.51 gaps were filled in correctly (*SD* = 10.22).

Feedback Manipulation. Participants received bogus feedback supposedly reflecting their performance in the German language proficiency test. The negative feedback read (positive feedback in parentheses): *"Out of a possible score of 70 points, you have received 24[63] points. In comparison with those taking the test who have learned German in the same age as you have you are among the 10 worst[best] percent; that means 9/10 of the population have a higher[lower] score in this language proficiency test than you."*

Self-Description Task. We administered Kuhn and McPartland's (1954) Twenty Statement Test (TST) in order to have participants spontaneously access self-knowledge. Participants were asked, "Who are you?" and invited to answer this question on 20 lines. Depending on the randomization to experimental conditions, the Twenty Statement Test was either to be completed in German (*TST in German*) or in their other language (*TST in other language*). To ensure that participants used the language they were supposed to use lines began with "I am" either in German when assigned to the *TST in German* or in their other most frequently used language (e.g. "Je suis" when in French) when assigned to the *TST in other language* condition. Participants were instructed to answer spontaneously and as if they were providing answers for themselves only. Also, they were instructed to stop when they were struggling to find any more self-descriptive statements. The number of statements provided per participant ranged from 3 to 20 (M = 14.63, SD = 6.02, *Mode* = 20, N = 122). Participants who were randomly assigned to the *no TST* condition (n = 59) did not work on the Twenty Statement Test.

State Self-Esteem. As a measure for participants' self-esteem, we presented the State Self-Esteem Scale (SSES, Heatherton & Polivy, 1991) in German translation. The SSES has been designed to measure the 'state' of self-esteem, i.e. situational variations in self-esteem. The scale consists of 20 items representing three factors of self-esteem: performance (sample item: "I feel confident about my abilities."), social (sample item: "I am worried about whether I am regarded as a success or failure."), and appearance (sample item: "I feel that others respect and admire me."). Answer options range from 1 (*disagree*) to 5 (*strongly agree*). Reliability analysis on all 20 items revealed a satisfying internal consistency (Cronbach's α = .90). Excluding the appearance item, "I am dissatisfied with my weight", reliability increased

(Cronbach's α = .91), therefore this item was excluded. The higher the resulting sum score, the more positive was the person's self-esteem (*M* = 72.59, *SD* = 11.70, *N* = 181).

Implicit self-esteem. To assess participants' implicit self-esteem, i.e. their non-conscious self-esteem, a Letter Rating Task was implemented. The underlying assumption of this task is that people like objects which refer to themselves, e.g. their name letters, more than letters they do not associate with their selves (Nuttin, 1985, 1987). Letter Ratings have been shown to be a valid technique for the unconscious assessment of participant's self-esteem (Greenwald & Banaji, 1995; Hoorens, 2014). The procedure simply asks participants for each letter of the alphabet how much they like them. From participants' evaluations of alphabet letters the traditional name letter score was calculated as a measure of implicit self-esteem (Albers, Rotteveel, & Dijksterhuis, 2009; Kitayama & Karasawa, 1997). To do so, in a first step, the normative evaluation of each alphabet letter is determined by averaging the evaluation of all participants who do not have this letter as their name letter, i.e. first and last name initial. In a second step, this normative score is subtracted from the participants' evaluations of their first and second name initials (e.g., for participants whose first name starts with A and second name with B the name letter score was determined by calculating the average of their personal liking of letter A minus the average liking of letter A by all participants whose first and last name starts with a different letter and their personal liking of letter B minus the average liking of letter B by all participants whose first and last name starts with a different letter). The resulting score was operationalized as the individual's level of implicit self-esteem (*ISE*) - the more positive the score the higher the level of implicit self-esteem. The resulting implicit self-esteem (*ISE*) on average was 13.53(*SD* = 20.33, *N* = 113).

$$ISE = [\,(x_{first\ name\ initial} - normative\ evaluation\ (first\ name\ initial)\,) + (x_{last\ name\ initial} - normative\ evaluation\ (last\ name\ initial))\,] / 2$$

Motivation. To measure participants' motivation regarding a second German language proficiency test they were presented three questions: (1) "How motivated are you to work on a second test?", (2) "How motivated are you to show good performance in a second test?", (3) "How motivated are you to receive feedback regarding your performance in the second test?". Answers were to be provided on a visual analog scale ranging from *not at all* (= 1) to *totally* (= 101). Factor analysis showed that all three items loaded on the same factor and reliability analysis were satisfying (Cronbach's $\alpha = .87$), therefore we computed one compound score for each person's motivation towards a second test where higher scores represent higher levels of motivation ($M = 62.22$, $SD = 31.44$, $N = 181$).

Performance in second German language test. Participants' performance in a second self-constructed C-test was administered. A short German text passage on the *Nobel Peace Prize* included 42 gaps (see Appendix B of this dissertation). A test score was calculated on the percentage of correctly answered gaps ($M = 59.92$, $SD = 22.71$).

Manipulation check. At the end of the questionnaire, participants were debriefed and informed that the feedback they had received did not reflect their actual performance. To control whether participants had believed in the feedback they were asked to provide a *Yes* or a *No* answer. Afterward participants were offered to learn their actual performance.

Preliminary Analysis

Length of Self-Description. Altogether participants provided 1002 meaningful self-descriptive statements. Five participants provided fewer than 5 statements and were therefore excluded from further analysis. A 2 (Feedback Manipulation: negative vs. positive feedback) x 2 (Self-Description Task: TST in another language vs. TST in German) independent

ANOVA was conducted on the number of statements generated by participants. This revealed no significant main effects for Feedback Manipulation, $F < 1$, or Self-Description Task, $F(1, 70) = 1.83$, $p = .18$, $\eta^2 = .03$. The interaction effect of Feedback Manipulation by Self-Description Task also did not show a statistically significant difference, $F(1, 70) = 2.59$, $p = .11$, $\eta^2 = .04$. Irrespective of the experimental condition, participants described themselves with the same amount of self-descriptive statements.

Suspicion check. To the question whether participants had believed in the feedback $n = 68$ of participants provided a *No*-answer. Interestingly, 52.80% ($n = 47$) of participants in the negative feedback condition ($n = 89$) stated that they had not believed in the feedback. In contrast, only 22.82% ($n = 21$) of the participants in the positive feedback condition ($n = 92$), claimed having not believed in the feedback. This is a significant difference between people not believing in the negative feedback and people not believing in the positive feedback, $x^2(1, N = 181) = 17.34$, $p < .001$.

Each of the six experimental conditions initially encompassed 28 to 33 participants. However, based on the manipulation check participants were excluded who had not believed in the feedback they received. Furthermore, we excluded participants who provided fewer than 5 statements in the Twenty Statement Task because it was not clear whether these participants had accessed self-knowledge in the respective language to a sufficient extent. In Table 15 the original N, the drop-out per category, and the newly obtained n of each condition group are displayed. All analyses were performed on data only from participants who indicated they had believed in the feedback and who had provided more than 5 statements ($N = 113$).

Table 15 Original and final cell sizes of experimental conditions

	Feedback Manipulation					
	Negative Feedback			Positive Feedback		
Self-Description Task	TST in German	TST in other language	No TST	TST in German	TST in other language	No TST
Original cell sizes	32	28	29	31	31	30
Not believed in the feedback	17	12	18	9	5	7
Fewer than 5 statements	2	1	-	0	2	-
Final cell sizes (*N*)	13	15	11	22	24	23

Results

State Self-Esteem. A 2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Task: TST in German vs. TST in other language vs. no TST) ANOVA on situational self-esteem revealed a non-significant main effect of Feedback Manipulation, $F < 1$. There was a significant main effect of the Self-Description Task on participants' state self-esteem, $F(2, 102) = 8.99$, $p < .001$, $\eta^2 = .15$. Post-hoc tests revealed that participants who described themselves in German were significantly lower in state self-esteem ($M = 69.22$, $SD = 14.20$) than participants who described themselves in another language ($M = 77.04$, $SD = 10.87$) or not at all ($M = 77.04$, $SD = 9.38$) ($ps < .01$). More importantly, the interaction of Feedback Manipulation by Self-Description Task, on participants' state self-esteem showed to be marginally significant, $F(2, 102) = 2.49$, $p = .088$, $\eta^2 = .05$. Following up on this marginally significant interaction by testing simple effects within the negative feedback condition showed a significant difference between Self-description Tasks, $p = .001$. Pairwise comparisons showed that within the negative feedback condition, there was a significant difference in state self-esteem between the "TST in German" ($M = 63.46$, $SD = 14.59$) and the "TST in other language" ($M = 78.27$, $SD = 10.33$)

(p = .001) and between the "TST in German" and the "no TST" (M = 81.00, SD = 9.38) (p < .001), but not between the "TST in other language" and "no TST" (p = .56). Within the positive feedback condition, simple effects were not significant, p = .24. The levels of state self-esteem in both feedback manipulation groups and all three self-description conditions are illustrated in Figure 9.

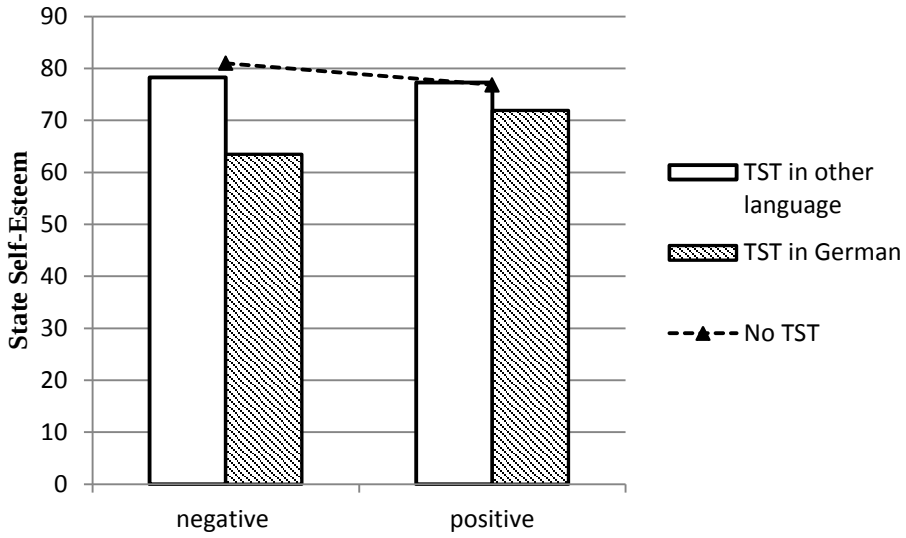

Figure 9 Group means on state self-esteem by feedback manipulation and self-description task

Implicit Self-Esteem. A 2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Task: TST in German vs. TST in other language vs. no TST) ANOVA on participants' levels of implicit self-esteem showed no main effect of Feedback Manipulation, F < 1, no main effect of Self-Description Task, $F(2, 106) = 3.27$, p = .36, η^2_p = .02, and no interaction effect of Feedback Manipulation by Self-Description Task, F < 1. Means are depicted in Figure 10 showing that within both feedback conditions, implicit self-esteem was highest among participants from the 'No TST' group.

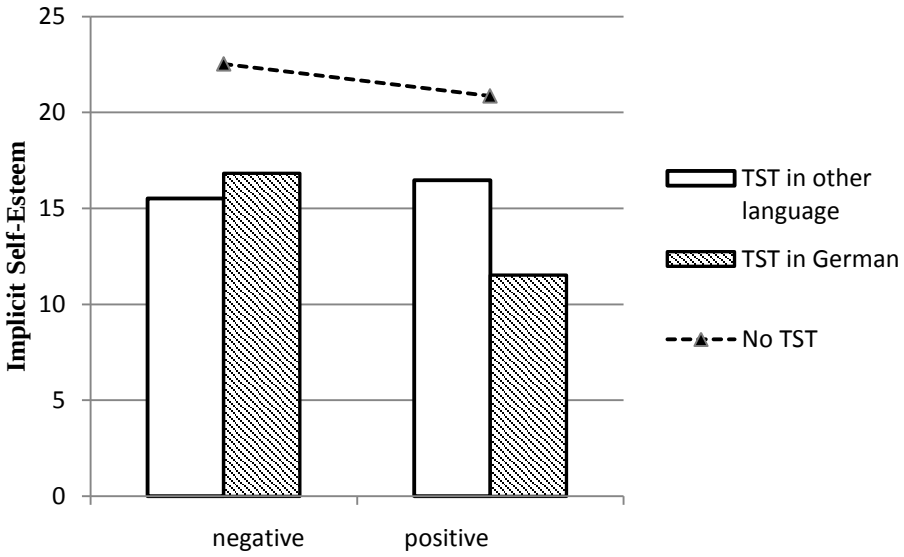

Figure 10 Group means on implicit self-esteem by feedback manipulation and self-description task

Motivation. A 2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Task: TST in German vs. TST in other language vs. no TST) ANOVA on motivation regarding a second language proficiency test revealed no main effect of Feedback Manipulation, $F < 1$, no main effect of Self-Description Task, $F(2, 102) = 2.32$, $p = .10$, $\eta^2 = .04$, and no significant interaction effect of Feedback Manipulation by Self-Description Task on participants' motivation, $F < 1$. As can be seen in Figure 11, in the negative feedback condition the mean of the 'TST in German' group evidently was lower ($M = 54.87$, $SD = 30.08$) than in the 'TST in other language' ($M = 74.51$, $SD = 30.20$). The difference, however, showed to be only marginally significant, $p = .076$. All other pairwise comparisons within feedback conditions were non-significant: ps > .24 for negative feedback; ps > .09 for positive feedback.

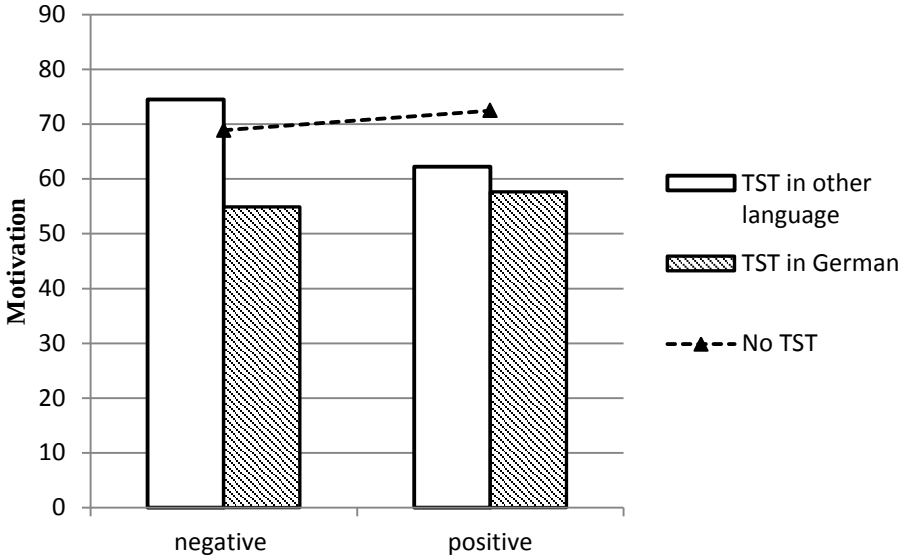

Figure 11 Group means on motivation by feedback manipulation and self-description task

Performance. Conducting a 2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Task: TST in German vs. TST in other language vs. no TST) ANCOVA with performance in the first test as the covariate revealed that performance in the first test, was significantly related to the performance in the second test, $F(1, 101) = 207.59$, $p < .001$, $r = .82$. There was no significant main effect of Feedback Manipulation, $F < 1$, Self-Description Task, $F < 1$, or interaction effect, $F < 1$. Means and standard deviations are presented in Table 16.

Table 16 Means and standard deviations for performance by feedback manipulation and self-description task

	Self-Description Task					
	TST in other language		TST in German		No TST	
Feedback Manipulation	*M*	*SD*	*M*	*SD*	*M*	*SD*
negative	.55	.21	.58	.25	.49	.26
positive	.68	.18	.57	.24	.60	.24

Note. Higher values indicate higher levels of performance.

Discussion

In Study 5, we aimed to test our assumption that people with everyday multiple language use profit from their language-dependent representation of self-knowledge in self-threatening situations. To this end, we designed an online experiment, including bogus feedback on participants' German language proficiency and a self-description task which either had to be completed in a language the participant uses in everyday life other than German or in German or no self-description (2 (Feedback Manipulation: negative feedback vs. positive feedback) x 3 (Self-Description Task: TST in German vs. TST in other language vs. no TST) experimental design).

We assumed that participants who after receiving negative feedback described themselves in another language than German exhibit higher levels of self-esteem, and motivation for a second language proficiency test where they would show better performance than participants who were not led to access self-knowledge in their other language. For participants receiving positive feedback, we did not assume any effects of self-description task.

As expected, participants in the negative feedback condition showed higher levels of state self-esteem and motivation when they described themselves in another language than when they described themselves in German. We take this as evidence that activating self-knowledge represented in another language enabled accessing contents of self-knowledge and their evaluation, respectively, which had not been affected and in consequence buffered the effect of negative feedback on participants' state self-esteem and motivation.

What is striking is that we did not find the same pattern of findings for implicit self-esteem. Following negative feedback, participants who described themselves in another language than German did not differ from participants who described themselves in German

in their levels of implicit self-esteem. Two explanations seem plausible for this pattern of findings: First, accessing self-knowledge pertaining to another language (as intended by the self-description in another language) after experiencing the self-threatening feedback might have caused an implicit spill-over of negative affect. Another possible explanation derives from the results of participants who did not work on a self-description task after receiving negative feedback. For both explicit and implicit self-esteem, they showed relatively high self-esteem. It is thinkable that they simply did not process the feedback as self-relevant and worked on.

The fact that they showed more motivation, which was also true for participants in the positive feedback condition who did not work on a self-description task, might be explained by the fact that participants were more motivated because they were faster.

Also, as expected, there were no significant differences depending on the language to be used for the self-description task between participants who had received positive feedback, neither for self-esteem nor for motivation. For the positive feedback condition again no differences in implicit self-esteem were expected and also not observed.

Regarding the participants' performance in the second language task, we did not find any differences between the different self-description conditions, neither within the negative nor the positive feedback condition. Again it is possible that the effect of the manipulation had faded in the meantime. Randomizing the sequence of measures following the feedback manipulation and self-description task would be one possibility for future experimental designs replicating the study's idea.

Interpreting our findings, we certainly face several limitations. First and foremost, in regard of the high rate of drop-outs in the negative feedback condition and the resulting differences in cell sizes between the negative and the positive feedback condition.

Replications of this study should make sure that people are less likely to drop out and are more likely to believe the negative feedback manipulation. Second, the study was conducted as an online study thus there was little control of the situation participants were in when working on the study. It would be interesting to conduct the experiment in a more controlled setting in order to replicate our findings.

To conclude, findings from Study 5 suggest that people with everyday multiple language use can profit from their language-dependent self-representation and buffer emotional-motivational loss by accessing self-knowledge which is associated with their other language.

GENERAL DISCUSSION

In this final chapter, we recapitulate the main empirical findings of the research presented in the preceding sections of this dissertation and discuss to what extent our theoretical assumptions receive support and broaden existing literature on the self and the current state of research on everyday multiple language use.

Impact of Everyday Multiple Language Use on the Self

The starting point of this dissertation was the notion that the self is influenced by everyday multiple language use. Based on existing literature, we developed the assumption that everyday multiple language use affects the representation of self-knowledge in memory. Furthermore, we assumed that a language-dependent self-representation involves positive consequences for emotion and motivation. In the following section, we summarize the empirical findings of our research with regard to our theoretical assumptions.

Language-Dependent Access on Self-Knowledge

Testing our theoretical assumptions that everyday multiple language use affects self-representation was in focus of Study 1 and Study 2. In Study 1, we examined spontaneous accessibility on self-knowledge pertaining to different (language) contexts as a function of different language use patterns (LUP). In Study 2, we investigated the distinctiveness of context-dependent sources of general self-evaluation as a function of different language use patterns.

In Study 1, we analyzed the content of spontaneous self-descriptions bilingual immigrant students had produced in an open self-description task in German while at school. Our findings revealed that students who use German only when at school described themselves using more school-related statements than students who use German also when at home. At the same time, students who use German only when at school produced less home-related statements for their self-description than students who use German also when at home. This finding supports our assumption that self-knowledge is mentally associated with the language in which it has typically been acquired and used. As a consequence, it seemed that the self-aspect “me at school” was more easily accessible for students who use German only when at school. Drawing on a second self-description task in which students had to rank-order different ready-made self-aspects according to their importance it was possible to show that the differences in self-produced context-related self-knowledge were not due to differences in the importance of these self-aspects between S-LUP (separate LUP) and F-LUP (fused LUP) students.

Focusing on differential effects of language use pattern regarding affective self-knowledge in Study 2, our analyses revealed that as expected for S-LUP students but not for F-LUP students, satisfaction with school and satisfaction with home contributed independently to the prediction of global self-esteem. It seems that as a result of their context-dependent language use, S-LUP students’ self-knowledge pertaining to the home context is predominantly represented in another language than self-knowledge pertaining to the school context and therefore more distinguishable sources of self-esteem.

To summarize, as expected, group comparisons between S-LUP students, who use German only when at school and F-LUP students, who use German also when at home, showed that self-knowledge - both cognitive contents as well as affective contents - referring to the home

context, a self-knowledge cluster which supposedly is not activated when in the school context, was more easily accessible for students who use German also when in the home context (F-LUP) and less accessible for students who use German only when at school (S-LUP). We take this as evidence that everyday multiple language use affects the representation of self-knowledge. Self-knowledge is more easily accessible when recall takes place in the language in which it has typically been acquired and used.

Our findings are compatible with the body of research on bilinguals' autobiographical memory (Marian & Fausey, 2006; Marian & Neisser, 2000; Matsumoto & Stanny, 2006; Mortensen, Berntsen, & Bohn, 2015), in which language-dependent access on (autobiographical) self-knowledge has been shown. However, what is new to this end, is that not only autobiographical self-knowledge which has been acquired in different languages across time is represented language-dependently, but also self-knowledge which is typically acquired and used in different languages across contexts. Our findings furthermore are congruent with anecdotal evidence suggesting that bilinguals conceive of themselves as different when switching languages. More specifically, our findings are in line with Dewaele's (2016) conclusion that feeling different was mainly true for bilinguals with a context-dependent language use pattern.

Furthermore, our findings expand the assumptions made by the model of the dynamic self (Hannover, 1997). Our findings fit well with the notion of a multi-faceted, context-dependent self-representation and the model of the dynamic self. However, what is more, our findings suggest that for people with everyday multiple language use language as a situational cue activates self-knowledge pertaining to a respective (language) context, or hampers the accessibility of self-knowledge pertaining to a different language context.

Assessing Language-Dependent Self-Representation

In Study 3, we chose a more direct approach for investigating our assumption that everyday multiple language use impacts on the representation of the self. Based on the procedure initially introduced by Linville to assess self-complexity (Linville, 1985), we developed a bilingual trait sorting task in which participants were free to describe different aspects of themselves with the help of trait cards that were printed on both sides containing the same trait in two different languages. Analyzing the resulting trait sorts showed that, in fact, the majority of participants had used traits in different languages for the description of their different self-aspects even though they were free to use only one question. Moreover, analyzing the pattern of language choice, we expected that the choice of language of the traits representing different self-aspects would correspond to language use in the respective contexts. More precisely, we tested whether participants who reported using English when at home would predominantly have their self-aspect related to the home context represented by traits in English. However, we were not able to show the expected association between the language of the traits associated with a self-aspect and the language used in the respective context.

In order to not only focus on singular self-aspects but the representation of self-knowledge in total, we introduced measures describing characteristics of language-dependent self-representation. Firstly, the proportion of traits in English (*PropEng*))measured the number of traits in English in correspondence with all traits. Secondly, we introduced the score Compartmentalization along language lines (*CaLL*) to describe the extent to which the self was represented in a way we coined *compartmentalized along language lines*. Our analysis revealed that both scores, describing characteristics of language-dependent self-representation, were independent of language proficiency and language use.

In anticipation of possible objection that compartmentalization of self-knowledge along language lines reflects the same organizing principle as described within the model of self-complexity, we tested whether language-dependent self-representation is a construct that is different from self-complexity. No significant correlations were found between scores describing language-dependent self-representation and alternative measures of self-complexity. To summarize, in Study 3, we introduce a procedure that allows a more direct assessment of language-dependent self-representation.

In summary, our findings indicate that the self of people with everyday multiple language use is characterized by a language-dependent representation of self-knowledge. Especially findings from Study 1 and Study 2 suggest that self-knowledge contents pertaining to (context-dependent) self-aspects are associated with the language that is typically spoken when in a specific context. As a consequence self-knowledge is more easily accessible when the language of retrieval matches the language of representation which had been used during encoding. Though we were not able to show the expected link between language use in a specific context and language of the traits representing the respective self-aspect, findings from Study 3 contribute to the literature on self-representation. A language-dependent representation of self-knowledge has not directly been examined yet. Hence, our study goes beyond the existing body of research that has investigated self-representation without considering the impact of language.

Positive Emotional and Motivational Consequences

In two studies, we pursued our assumption that language-dependent self-representation in individuals with everyday multiple language use involves positive emotional and motivational consequences. In Study 4, we investigated whether language-dependent self-representation hampers spill-over of negative affect. In Study 5, we conducted an experiment to investigate

our assumption that language-dependent self-representation offers a cognitive buffer against emotional-motivational loss. In the following, we summarize and discuss the findings from both studies.

The spill over - hypothesis (Linville, 1985) postulates that the organization of self-knowledge moderates the impact of self-threatening experiences on self-esteem, with a more complex organization hampering the spill-over of negative affect. Based on this notion, we assumed that a language-dependent organization of self-knowledge offers an additional dimension for a more complex organization of the self. Scores describing the tendency to organize self-knowledge along language lines had been obtained using the newly developed method described in Study 3. In line with the spill over hypothesis, we expected that the more compartmentalized along language lines the smaller the effect of self-threatening feedback on self-esteem variation and participants' mood.

Relating participants' variation in self-esteem to scores describing their language-dependent self-representation in Study 4 revealed that participants who had represented their self-knowledge language-dependently despite receiving negative bogus feedback showed less variation than participants who had used one language only for their self-representation. Furthermore, we were able to show that language-dependent self-representation had an influence on participants' mood. Our findings suggest that spill over is facilitated when self-knowledge is represented in one language only, in our case the language of the negative feedback. What is more, our findings indicate that *compartmentalization along language lines* buffered the negative effect on participants' mood.

Our findings provide evidence for our assumption that language-dependent self-representation influences the spread of activation and accessibility of self-knowledge: It seems that language-dependent self-representation as compared to monolingual self-representation

hampers the affective spill over from one self-aspect to other self-aspects and as a consequence self-esteem did not decrease after receiving negative feedback. Taken together, in Study 4, we found evidence suggesting that a language-dependent self-representation moderates the activation of self-knowledge across self-aspects.

In Study 5, we further investigated our theoretical assumption that language-dependent self-representation offers positive emotional and motivational consequences. To test our assumptions, participants were randomly assigned to either receiving negative or positive feedback on their performance in a language proficiency test. After participants had received bogus feedback they either had to describe themselves in the same language as the feedback had been presented or in their other language. We expected that the language of the self-description would cause differences in participants' self-esteem, motivation, and performance after receiving negative feedback. As expected, our analysis revealed that participants who described themselves in the other language had higher levels of state self-esteem and were more motivated to work on a second language proficiency test, as compared to participants who described themselves in German, the same language as the feedback had referred to.

We assume that participants who were led to describe themselves in another language activated self-knowledge contents which had not been activated when they received negative feedback. Participants who described themselves in the same language were not provided with a situational cue that would change the content of their working self. As a consequence, participants who described themselves using another language accessed a new source of self-esteem and restored a positive self-view, whereas the other participants did not. This helped participants to stay motivated for a second language proficiency test.

This finding supports our assumption that a language-dependent self-representation offers a cognitive buffer. It seems that participants who were lead to access self-knowledge pertaining

to the other language accessed a resource of emotion and motivation that helped them buffer the negative effect of the feedback. For participants who had received positive feedback, we did not find an effect of the language of the self-description task. However, this was in line with our expectations.

Taken together, on the basis of our findings, we conclude that everyday multiple language use is a potential resource for the self.

Limitations

Before we discuss the theoretical implications and practical relevance of our findings, consideration should be given to the methodological limitations of our studies. Across studies methodological limitations apply regarding the samples and the methodology. In the following section, we want to address these limitations, discuss their potential impact on our findings, and make suggestions how these could be circumvented in the future.

The first limitation concerns the samples we investigated. In all of our five studies, we relied on testing our theoretical assumptions in highly heterogeneous samples regarding the language use of participants. In Study 1 and Study 2, we relied on existing datasets from comprehensive school studies and filtered out participants of various linguistic backgrounds who had indicated everyday multiple language use. In Study 4, international students who had currently been using English as a foreign language in everyday life participated in our experiment. In Study 5, we conducted an online study in order to be able to fulfill the statistical criteria regarding sample size. Only in Study 3, we approached a sample of school students who spoke English and Norwegian, which we believed to be homogeneous until

analyzing the information participants had given on their language background provided insight into the variety of languages participants used in addition to English and Norwegian.

From a theoretical perspective, the heterogeneity among participants with regard to the languages they used has not caused any concern. After all, we did not hypothesize that our assumptions are true for a specific combination of languages. Instead, we hypothesized that potential effects of everyday multiple language use on the self are a consequence if *using* multiple languages in everyday life which in consequence implies generating self-knowledge while using different languages.

From a practical perspective, however, studying heterogeneous samples caused challenges regarding the materials we had to provide and the analysis that we were able to perform. For instance in Study 4, the trait sorting task needed to be accustomed to the first languages of the participants. In cases where we were not able to provide an accustomed card deck, participants were instructed to translate the traits into their first language themselves. Though we checked, and did not find any differences in the resulting trait sortings between participants for which translations had been provided and participants who had to find translations themselves before working on their self-description, we are aware of the fact that the procedure was different between participants. Furthermore, we are aware of the fact that meaning of words are changed by translations (Altarriba, 2003). In the end, every piece of research dealing with consequences of everyday multiple language use needs to acknowledge that bilinguals are not two (or more) monolinguals in one person (Grosjean, 2010) and that bilingualism needs to be understood as a wide spectra of experience related to the use of different language rather than a categorical variable (Luk & Bialystok, 2013) A second challenge emerged in Study 5 where participants provided self-descriptions in either German or their other language. Due to the variety of participants' languages it was not possible for us to analyze the self-descriptions participants had provided and as a consequence the data had

not been used. To conclude, we propose that future studies should consider approaching samples with participants of a specific language combination to better fulfill economic research criteria.

The second limitation we want to address is at the same time the strength of the research of this dissertation. Investigating the consequences of everyday multiple language use on the self both constructs being complex in themselves, yet their combination, demanded to think outside the box, to use indirect methods, to invent new procedures and to find creative ways of analysis. As a consequence, a lot of the materials we implemented in our studies were self-constructed or newly invented. The operationalization of language use patterns which served as the independent variable of Study 1 and Study 2, for instance, or, the method to assess language-dependent self-representation (Study 3 and Study 4) were newly developed. On the one hand, this is what made the particular research question especially interesting and its results are particularly novel. On the other hand, a drawback of breaking new ground and developing an entirely new research typology, is that future research is needed to replicate findings, to test the reliability and validity of our procedures, and to address the many gaps in the knowledge base which newly emerged.

Theoretical Implications and Practical Relevance

In the following section we discuss the theoretical implications and practical relevance of our findings.

Regarding the theoretical level, we suggest that our research broadens the perspective on the structure of the self. Existing models have failed to account for what is a fact for millions of people: Self-knowledge is generated while using different languages. In consequence, models

need to be revised and extended for the case of everyday multiple language use. As we have already mentioned, our findings suggest that the notion of multiple, context-dependent self-constructs should include the notion of language-dependent self-constructs in people with everyday multiple language use. Current research on self-concept structure, such as conducted within the Multiple Self-Aspects Framework (McConnell, 2011), should not only take the potential impact of participants' multiple language use into account, but instead, and, in addition, should address the impact of everyday multiple language use on the self and resulting implications by deliberately addressing appropriate research questions.

On the one hand, our research contributes to the existing body of research on the self. On the other hand, our research also contributes to the current state of research on consequences of everyday multiple language use. Research on the impact of everyday multiple language use within educational science has mainly focused on its consequences for academic abilities. The prevailing deficit-oriented perspective is predominantly inspired by results from large-scale assessments. International school achievement studies, such as the Programme for International Student Assessment (PISA) undertaken by the Organisation for Economic Co-operation and Development (OECD) to survey learning outcomes of 15-year-old students worldwide, generally reveal negative effects of using multiple languages in daily life on students' academic achievement. With only few exceptions the distinct pattern that repeatedly emerged across educational systems in these large-scale assessments is that students who speak a language that is different from the language of instruction at school when in the home context perform significantly lower than students who speak the language of instruction also when in the home context (e.g., OECD, 2010b, 2012; Stanat & Christensen, 2006).

Speaking another language at home than the language of instruction at school typically is a situation for students with an immigrant background, i.e. students who are foreign-born (first-generation immigrants) or have foreign-born parents (second-generation immigrants) (OECD,

2010a). Data from Germany for instance, reveal that only one half of one percent of students without an immigrant background as compared to 47.2% of first- and second-generation immigrant students use a language at home other than German, the language of instruction at school (Stanat & Christensen, 2006). Having an immigrant background is likely accompanied by a number of variables that are provocative of poor academic achievement themselves, e.g. low socio-economic status. However, detailed analyses controlling for background variables that are reflective of students' economic, social and cultural status did not show to eliminate the disparities between students who speak another language than the language of instruction when at home and students who use the language of instruction also when at home and still reveal performance differences in all three domains of assessment - reading, mathematics, and science (Gebhardt et al., 2013; Walter, 2008).

Based on these findings it has been suggested that students' limited exposure to the language of instruction due to speaking another language at home causes deficits in mastering the language of instruction with detrimental effects on performance across subjects and students' academic achievement in general (Esser, 2006; Stanat & Christensen, 2006; cf. Cummins, 2008). In fact, this reasoning is in line with findings from linguistic research showing that the regular use of two or more languages involves negative consequences for vocabulary size (e.g., Bialystok, Luk, Peets, & Yang, 2010) and language functioning (e.g., Kroll & Bialystok, 2013; Portocarrero, Burright, & Donovick, 2007).

In summary, results from PISA, as one example of several school achievement studies showing the same results, predominantly suggest that students using another language than the language of instruction when at home are at risk for low performance (OECD, 2016), and accordingly everyday multiple language use is understood as a challenge for students' to succeed academically. "Speaking a different language at home from the language of

assessment is one of the barriers to learning students with an immigrant background and other students must try to overcome" (OECD, 2016, p. 75).

While we do not want to question the validity and significance of these results, based on our research findings, we still want to argue for a more resource-oriented perspective on the consequences of everyday multiple language use.

Our resource-oriented notion receives support from studies on executive control showing that individuals using multiple languages in everyday life possess an advantage over monolinguals. This research typically compares monolinguals and bilinguals regarding their performance, in terms of failure rates and reaction times, in tasks including stimuli that require some aspects of executive control, e.g. controlling attention, inhibiting distraction, or shifting between tasks. One such example being the Stroop task in which participants are asked to name the font color of the words presented to them on the screen as quickly as possible. The experiment includes congruent and incongruent trials: Color words are either printed in their own color (congruent trial, e.g. the word "red" in red) or color words are presented in a different colored font (incongruent trial, e.g., the word "blue" printed in red). The ability to control attention and inhibit the misleading tendency to name the word rather than its color, the so-called Stroop effect, is operationalized as the difference in speed between congruent and incongruent trials. Accumulating evidence from studies with groups of bilingual and monolingual participants using the Stroop task or related paradigms, in general, reveals that bilinguals sustain smaller costs and outperform monolinguals in this kind of tasks (for reviews, see Adesope, Lavin, Thompson, & Ungerleider, 2010; Bialystok et al., 2009; Bialystok, 2009; Bialystok, Craik, & Luk, 2012; Kroll & Bialystok, 2013).

Moreover, examining different age groups from childhood to old age has resulted in evidence for a bilingual advantage in cognitive control across the lifespan (Bialystok et al., 2008;

Bialystok & Poarch, 2014). For instance, in a study conducted by Bialystok and colleagues (Bialystok, 1999; Bialystok & Martin, 2004), bilingual and monolingual children aged between 4 and 5 years participated in a card sorting game. After sorting cards by one dimension for some time, e.g. by shape, the sorting rule was switched to the other dimension, e.g. color. Analysis revealed that bilingual children were better at switching to the new sorting rule than monolingual children. Similarly, in a study using reversible figures, bilingual children around 6 years of age showed to be more successful in identifying the alternative image than their monolingual peers (Bialystok & Shapero, 2005).

In a study investigating bilingual and monolingual adults ranging in age from 30 to 88 years, regarding their ability for inhibitory control Bialystok, Craik, Klein, and Viswanathan (2004) provided evidence for a bilingual advantage in adulthood – with most positive influences in older adults. The study involved working on the Simon task, an experiment in which participants need to react to the color of stimuli presented on the screen instead of its position on the screen by pressing one of two response keys. In congruent trials, the stimulus appears directly above the appropriate key, in incongruent trials the stimulus appears above the other key. What Bialystok and colleagues using this experimental paradigm found was that monolinguals in comparison to bilinguals had a harder time in correctly reacting to incongruent stimuli. The so-called Simon effect, i.e. the difference between incongruent and congruent latencies, was smaller for bilinguals. Moreover, the difference between monolinguals and bilinguals was especially strong in older adults, suggesting that cognitive aging was slower for bilinguals than monolinguals. Bialystok and colleagues concluded that these findings are an indication for the possibility that bilingualism involves some sort of a “cognitive reserve” in terms of a protective function against cognitive decline, that

presumably contributes to a delay in the onset of age-related dementia (Bialystok, Craik, & Luk, 2012).

To summarize, Bialystok and colleagues investigating cognitive control in bilinguals, on the basis of their findings, conclude that due to the intense experience of handling two language systems in daily life that are active in parallel at any time (Kroll & Bialystok, 2013) - no matter how short and regardless of the language pairs involved (Barac, Bialystok, Castro, & Sanchez, 2014) - control processes become enhanced and generalize to other unrelated aspects of cognitive control and executive functioning (Bialystok & Poarch, 2014; Kroll & Bialystok, 2013)

Based on these findings which certainly are of significance in a world where people not only do get older in age but populations also increasingly become bilingual, it is hard to counterbalance the findings on academic disadvantages and findings on enhanced cognitive capacities resulting from everyday multiple language use, the two opposing forces of bilingualism (Luk, 2008), against each other. However, what seems to be the case regarding the strong evidence on bilingual students' poor academic performance is that they fail to realize their bilingual advantage which have been shown in experimental settings.

As it seems very likely that individuals also fail to realize the potential positive emotional and motivational consequences resulting from their language-dependent self-representation which we have found in our studies, we suggest that future research approaches the question how individuals using multiple languages in everyday life can avail themselves of the potential benefits associated with their multiple language use.

At this stage a possible approach to help students make use of their hidden potentials might be to apply the experimental procedure from Study 5 within the school context. Students could

be given 5 minutes for a short writing task in their other, out-of-school language after receiving (negative) performance feedback. Similarly as shown in our experiment, this could help students to buffer the impact of the feedback and help them restore motivation to continue.

To realize such approaches it is necessary that school contexts refrain from their one language policy. According to a qualitative study, a school program that allowed students to yield their linguistic repertoires within the school context, has been very successful in opening teacher's eyes for the competences students possess and in giving students a feeling of confidence and acknowledgement (D'warte, 2014).

Future Research Directions

Future research investigating the effects of everyday multiple language use on the self could expand the current understanding of the self. Before concluding the present dissertation, in this section, we make two suggestions for future research directions.

Our results suggest that everyday multiple language use might particularly affect the self in individuals whose multiple language use is context-dependent. The specific features of context-dependent language use have recently also attracted research on cognitive effects of everyday multiple language use (Verhagen, Mulder, & Leseman, 2015; Woumans, Ceuleers, Van der Linden, Szmalec, & Duyck, 2015). For future research, we suggest to investigate the specific consequences regarding emotion and motivation in more detail.

Furthermore, we suggest that it would be interesting to follow up on the idea that the relation between social interaction and the self is not a one-way direction (Zander & Hannover, 2014). Social interaction and the languages spoken do not only impact the self, but the self also

impacts on social interactions. Hence, it would be interesting to follow the relation in the other direction and see how a language-dependent self-representation might impact on social interactions. Analysis of social networks within educational contexts of students with everyday multiple language use, for instance, might be an interesting project for the future.

Conclusion

In this dissertation, we have investigated how everyday multiple language use affects the self. Bringing together two multi-faceted constructs has opened a window for a better understanding of the self - which can only be achieved if its multiplicity, complex coming together of individual constituents and often unique contributions to the whole are taken into account (Klein, 2012). Furthermore, we have broadened the perspective pursued within educational research on consequences of everyday multiple language use regarding academic outcomes. In contrast to considering everyday multiple language use a challenge, our research suggests that everyday multiple language use impacts on self-representation and involves positive consequences for emotion and motivation. Given that everyday multiple language use is a reality for millions of people, future research should commit itself to identifying further (positive) consequences of everyday multiple language use and thus potentially provide empirical evidence supporting a resource-oriented perspective.

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APPENDIX A

Concerning Study 3 and Study 4:

Material and Procedure of the adapted, bilingual trait sorting task

To measure the language-dependent organization of self-knowledge, we introduced an adapted, bilingual version of the trait sorting task initially developed by Linville (1985, 1987). In the following section, we present the material and procedure of the adapted, bilingual version of the trait sorting task.

On the basis of a sample recording sheet displaying the trait sort of a German-English bilingual participant in Study 4 it is shown how different measures of language-dependent self-representation and self-complexity had been obtained.

Table List of traits used in the adapted, bilingual version of the trait sorting task

	English	Dutch	French	German	Italian	Norwegian	Spanish	Swedish
1	**Competitive**	Concurrerend	Concurrent, -e	Konkurrierend	Competitivo, -a	Konkurrerende	Competitivo, -a	Konkurrerande
2	**Quiet**	Kalm	Calme	Schweigsam	Tranquillo, -a	Stille	Quieto, -a	Lugn
3	**Relaxed**	Ontspannen	Détendu, -e	Entspannt	Rilassato, -a	Avslappet	Relajado, -a	Avslappnad
4	**Rude**	Onbeleefd	Indecént, -e	Unanständig	Maleducato, -a	Usivilisert	Indecente	Ohövlig
5	**Organized**	Geordend	Organisé, -e	Organisiert	Organizzato, -a	Organisert	Organizado, -a	Organiserad
6	**Unfriendly**	Onvriendelijk	Inamical, -e	Unfreundlich	Scortese	Uvennlig	Displicente	Ovänlig
7	**Affectionate**	Teder	Affectueux, -euse	Liebevoll	Affezionato, -a	Kjærlig	Afectuoso, -a	Kärleksfull
8	**Studious**	Vlijtig	Travailleur, -euse	Fleißig	Studioso, -a	Flittig	Estudioso, -a	Flitig
9	**Reflective**	Nadenkend	Pensif, -ve	Nachdenklich	Riflessivo, -a	Reflektert	Pensativo, -a	Eftertänksam
10	**Soft-Hearted**	Zachtzinnig	Tendre	Weichherzig	Cuore Tenero	Godhjertet	Compasivo, -a	Godhjärtad
11	**Not Studious**	Niet Vlijtig	Non Travailleur, -euse	nicht fleißig	Non Studioso, -a	Ikke Flittig	No Estudioso, -a	Inte Flitig
12	**Unconventional**	Onconventioneel	Bohème	Unkonventionell	Non Convenzionale	Ukonvensjonell	Inusual	Ovanlig
13	**Impulsive**	Impulsief	Impulsif, -ve	Impulsiv	Impulsivo, -a	Impulsiv	Impulsivo, -a	Impulsiv
14	**Shallow**	Oppervlakkig	Superficiel, -le	Oberflächlich	Superficiale	Overfladisk	Superficial	Ytlig
15	**Reserved**	Behoedzaam	Réservé, -e	Zurückhaltend	Riservato, -a	Reservert	Reservado, -a	Reserverad
16	**Unorganized**	Ongeorganiseerd	Inorganisé, -e	Unorganisiert	Disorganizzato, -a	Uorganisert	Desorganizado, -a	Oorganiserad
17	**Conformist**	Conformistisch	Conformiste	Konformistisch	Conformista	Konform	Conformista	Konformistik
18	**Irresponsible**	Onbetrouwbaar	Irresponsable	Unzuverlässig	Irresponsabile	Uansvarlig	Poco Fiable	Ansvarslös
19	**Humorous**	Humoristisch	Humoristique	Humorvoll	Spiritoso, -a	Humoristisk	Humorístico, -a	Humoristisk
20	**Reckless**	Roekeloos	Indélicat, -e	Rücksichtslos	Senza Discrezione	Hensynsløs	Atropellador, -a	Hänsynslös

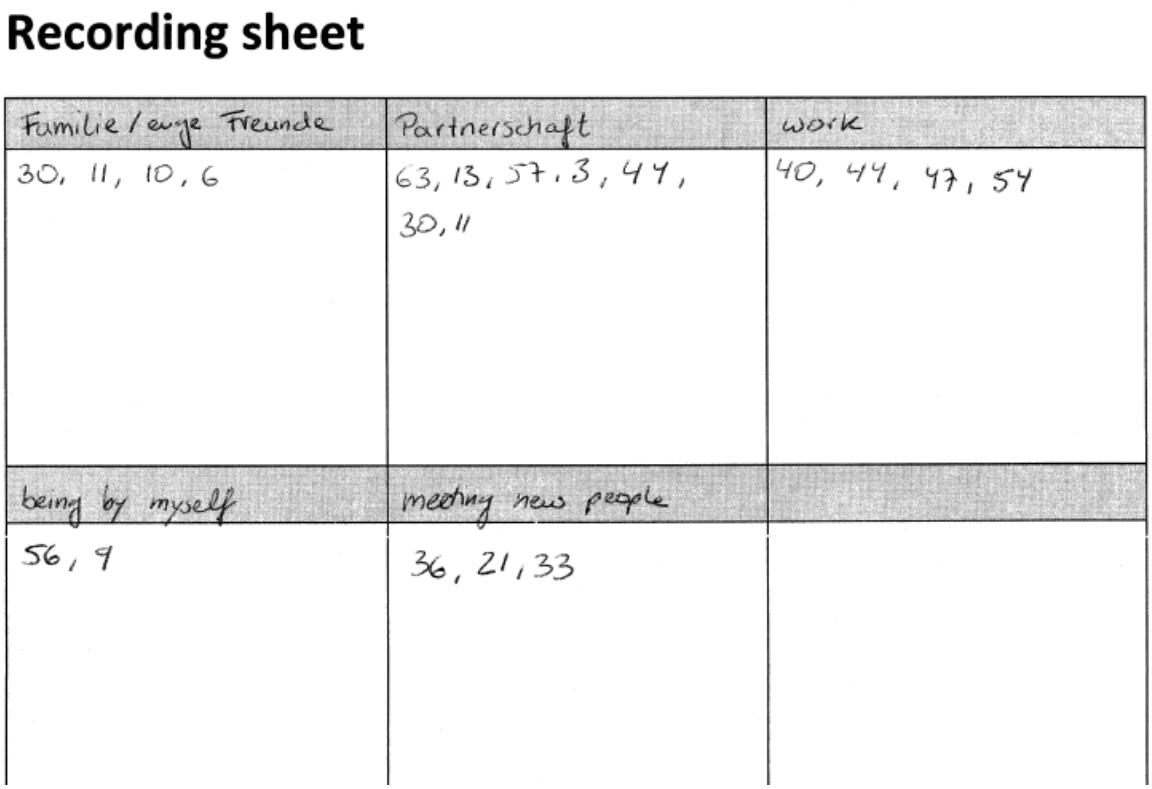
Table List of traits used in the adapted, bilingual version of the trait sorting task (continued)

	English	Dutch	French	German	Italian	Norwegian	Spanish	Swedish
21	**Anxious**	Angstig	Anxieux, -euse	Ängstlich	Ansioso, -a	Engstelig	Medroso, -a	Ängslig
22	**Individualistic**	Individualistisch	Individualiste	Individualistisch	Individualista	Individualistisk	Individualista	Individualistisk
23	**Insecure**	Onzeker	Flottant, -e	Unsicher	Insicuro, -a	Usikker	Inseguro, -a	Osäker
24	**Mature**	Rijp	Mûr, -e	Reif	Maturo, -a	Moden	Maduro, -a	Mogen
25	**Imaginative**	Inventief	Imaginatif, -ve	Ideenreich	Fantasioso, -a	Fantasifull	Imaginativo, -a	Fantasirik
26	**Lazy**	Laks	Paresseux, -euse	Faul	Pigro, -a	Lat	Perezoso, -a	Lat
27	**Industrious**	Ijverig	Assidu, -e	Arbeitsam	Laborioso, -a	Arbeidsom	Trabajador, -a	Arbetsam
28	**Outgoing**	Extravert	Sociable	Kontaktfreudig	Estroverso, -a	Utadvendt	Sociable	Sällskaplig
29	**Assertive**	Bepaald	Décidé, -e	Durchsetzungsfähig	Assertivo, -a	Påståelig	Decidido, -a	Bestämt
30	**Playful**	Guitig	Espiègle	Neckisch	Giocoso, -a	Leken	Chistoso, -a	Lekfull
31	**Sophisticated**	Gesofisticeerd	Sophistiqué, -e	Anspruchsvoll	Sofisticato, -a	Sofistikert	Sofisticado, -a	Sofistikerad
32	**Rebellious**	Rebels	Rebelle	Rebellisch	Ribelle	Opprørsk	Rebelde	Rebellisk
33	**Emotional**	Emotioneel	Emotionnel, -le	Gefühlsbetont	Emotivo, -a	Følsom	Emocional	Känslobetonad

Procedure to obtain measures of self-representation

Table Instructions for the bilingual trait sorting task (adapted from Linville (1987))

You received 33 cards and a recording sheet. Each card contains the name of a trait or characteristic in Norwegian (bokmål) on the one side and in English on the other side together with a little number. Your task is to describe yourself using these cards. Think of the different aspects of yourself or your life and then sort the cards into groups where each group describes an aspect of yourself or your life. Groups can be formed on any meaningful basis - as long as you remember to think about yourself. Form as many or as few groups as you desire. Each group may contain as few or as many traits as you wish. You do not have to use every trait, only those descriptive of you. With every card you use for describing yourself you get to decide whether you want to use the trait in Norwegian (bokmål) or in English. Also, each trait may be used in more than one group. Continue forming groups until you feel that you have formed the important ones. When you feel that you are straining to form more groups, it is probably a good time to stop. You get 30 minutes to complete the task. I will let you know when 25 minutes are over. When you have finished use the recording sheet to indicate which traits you have put together. Each box will correspond to one of your groups. Give each of your groups a descriptive label and write down the numbers of the traits that form a group into the box. Write only the numbers, not the name of the trait. The order in which you record the groups is not important, nor is the order of the traits within a group. We are only interested in which traits you group together. Please remember, you are describing yourself, you do not have to use all traits, you can use traits in Norwegian (bokmål) and in English, you may reuse a trait in several groups, and be as honest as you can!



Recording sheet

Familie / enge Freunde	Partnerschaft	work
30, 11, 10, 6	63, 13, 57, 3, 44, 30, 11	40, 44, 47, 54
being by myself	meeting new people	
56, 9	36, 21, 33	

Figure Sample trait sort of a German-English speaking participant as captured on the recording sheet

As a first step the trait sorting result was translated into a matrix with one column per group the participant had created and 66 rows for each trait contained in the task. The calculation matrix included a contingency table, where the total number of traits used in each group, as well as the number of traits used in the participant's first language and in English was summed. On this basis the different scores to describe the complexity and compartmentalization of self-representation were obtained in different calculation procedures.

Measures of self-complexity

Number of self-aspects (*NSA*)

The number of self-aspects (*NSA*) is operationalized as the number of groups the participant formed in the trait sort. In the sample trait sort the participant had sorted traits into 5 groups labeled as “Familie / enge Freunde” (group A), “Partnerschaft” (group B), “work” (group C), “being by myself” (group D) and “meeting new people” (group E). Accordingly, the *NSA* score for this participant was 5.

Overlap (*OL*)

The overlap measure is supposed to reflect the probability for ‘spill-over’, which according to (Linville, 1985) is caused by shared traits between a person’s self-aspects. Thus, overlap (*OL*) is defined as the average redundancy of traits across all possible pairs of self-aspects the participant created in the trait sort. Adapting the formula proposed by Rafaeli-Mor, Gotlib, & Revelle (1999) the *OL* score was calculated implementing:

$$OL = \frac{\sum_i (\sum_j C_{ij}) / T_i}{NSA * (NSA - 1)}$$

where *C* refers to the number of shared traits in any possible combination of two self-aspects (*ij*); *T* refers to the total number of traits used in the referent self-aspect (i) and *NSA*, as defined above, reflecting the number of self-aspects created in the trait sort.

The *OL* score equals zero if a person did not reuse any trait in another self-aspect. The more often the person used traits to describe different self-aspects of himself or herself, the higher is the overlap across self-aspects, the higher also the probability of ‘spill-over’, and the closer the *OL* score to 1.

For the sample trait sort presented here, there are (4 x 4 =) 16 possible pairwise combinations of self-aspects: AB, AC, AD, AE, BA, BC, BD, BE, CA, CB, CD, CE, DA, DB, DC, and DE. Starting with group A as the referent self-aspect (T_A = 4), there are two traits which are in common with group B (trait 11 and trait 30) but no shared traits when comparing to group C, group D, and group E. Comparing group B (T_B = 7) to group A, we already know there are two traits they have in common (trait 11 and trait 30), comparing to group C there is one trait in common (trait 44), while there are no shared traits with group D and E. Group C (T_C = 4) does not share any traits with group A, group C or group E, but has one trait in common with group B (trait 44). Examining group D (T_D = 2) and group E (T_E = 3) as the referent groups neither contains traits which are shared with any of the other groups.

The calculation therefore is

$$OL = [(2/4 + 0/4 + 0/4 + 0/4) + (2/7 + 1/7 + 0/7 + 0/7) +$$
$$+ (0/4 + 2/4 + 0/4 + 0/4) + (0/2 + 0/2 + 0/2 + 0/2) +$$
$$+ (0/3 + 0/3 + 0/3 + 0/3)] / [5 * (5 - 1)] = .06$$

The resulting value (*OL* = .06) is rather small, as the observed overlap was minor and limited to only some group combinations, while the majority of group combinations did not show any overlap across self-aspects.

Self-complexity (*SC*)

The traditional measure for self-complexity is calculated based on the *H* statistic, an information theory based measure of dimensional complexity and dispersion (Attneave, 1959; Scott, 1969). Linville introduced the *H* statistic method to analyze individuals' trait sorts, proposing that it measures structural complexity in terms of the number of independent dimensions (Linville, 1982).

The maximum score for *SC* depends on the number of traits included in the sorting task. In Study 3, there were 33 traits in two languages, thus the total number of traits available was 66 and the maximum *SC* score was $\log_2 66 = 6.04$. A high *SC* score corresponds to a complex organization of self-knowledge, whereas a relatively low score on *SC* is indicative of low self-complexity, that is a relatively low number of self-aspects (*NSA*) with relatively high overlap (*OL*) among self-aspects.

The formula for calculating the self-complexity score is:

$$SC = log_2 n - (\sum_i n_i log_2 n_i)/n$$

where n is the total number of traits available in the sorting task ($n = 66$) and n_i is the number of traits that appear in a particular unique group combination. That means, in contrast to calculating overlap where only pairwise group combinations where considered, for calculating the *SC* score all possible group combinations in which a trait can be represented (singles, pairwise, three-way, …) need to be taken into account.

In the sample trait sort with 5 self-aspects formed, the number of unique group combinations is 31: A, B, C, D, E, AB, AC, AD, AE, BC, BD, BE, CD, CE, DE, ABC, ABD, ABE, ACD, ACE, ADE, BCD, BCE, BDE, CDE, ABCD, ABCE, ABDE, ACDE, BCDE and ABCDE; plus the possibility of being represented in ‘no group’. Next, the number of traits that fall into each of the unique group combinations must be counted. In the singles, there are two traits that are sorted in group A only (trait 6 and trait 10; $n_A = 2$), four traits sorted in group B only (trait and trait; $n_B = 4$), three traits sorted in group C only ($n_C = 3$), two in group D only ($n_D = 2$), and three in group E only ($n_E = 3$). In the pairwise group combinations, there were 2 traits in group A and B ($n_{AB} = 2$) and one trait in group B and C ($n_{BC} = 1$). There are no traits that fall into any other pairwise, threeway, fourway or the ABCDE – combination, n_i of these

group combinations are intentionally excluded from the formula. 49 traits were not included in any group, thus $n_{'no\ group'} = 49$.

Applying the numbers to the formula

$$SC = \log_2 66 - [(2 \log_2 2) + (4 \log_2 4) + (3 \log_2 3) + (2 \log_2 2) + (3 \log_2 3) +$$
$$+ (2 \log_2 2) + (1 \log_2 1) + (49 \log_2 49)] / 66 =$$
$$= 6.04 - [2 + 8 + 4.75 + 2 + 4.75 + 2 + 0 + 275.12] / 66 =$$
$$= 6.04 - 298.63 / 66 = 1.52$$

the resulting value for the *SC* score is 1.52. In comparison to the $SC_{max} = 6.04$, the score that was maximally possible to obtain, the participant's self-complexity was not particularly prominent.

Measures of language-dependent self-representation

Compartmentalization along language lines (*CaLL*)

To measure the tendency of organizing self-knowledge along language lines I adapted the procedure Showers (1992) introduced to measure the compartmentalization of positive and negative self-knowledge, focusing on the compartmentalization of self-knowledge in L1 and in English instead. Based on Pearson's chi square analysis, the scattering versus compartmentalization of self-knowledge in L1 and in English is determined and expressed in the Cramér's *V* coefficient.

Cramér's *V* theoretically ranges from 0 to 1 and, as applied by me, mirrors the distribution of traits in English and in L1 over self-aspects. If the choice of traits in English and traits in L1 in an individual's sort happened to be at random and does not show any tendency for language-based organization of self-knowledge, the coefficient equals 0. If the language of the traits within any self-aspect was chosen on a meaningful basis, the score is different from

zero; the greater the tendency to organize self-knowledge along language lines, the more approximating 1.

To calculate Cramér's *V*, observed frequencies are contrasted to theoretically expected frequencies if they were at random. To do so the contingency table at the end of the calculation matrix, containing the observed frequencies of traits the participant had used in his/her L1 and of traits used in English, was extended and the row totals calculated. In the next step, the expected frequencies of traits in L1 and in English if they were at random were determined by calculating the product of row totals and column totals divided by the total number of traits used in the individual's sort ($\sum T$). Next, the chi square value (χ^2) is calculated by adding up the squared difference between expected and observed frequencies of traits in L1 and in English in each cell. Finally, the Cramér's *V* coefficient is calculated by inserting the chi square (χ^2) value into the following equation (with $\sum T$ as the total number of traits used by the participant):

$$Cramérs\ V = \sqrt{\frac{\chi^2}{\sum T}}$$

The first step in the procedure to obtain Cramer's *V* for the sample trait sort was extending the contingency table displaying the observed frequencies for row totals (column ∑)

	A	B	C	D	E	∑
observed t_{L1}	3	4	3	1	0	11
observed $t_{English}$	1	3	1	1	3	9
T	4	7	4	2	3	20

To obtain the expected frequencies of traits in L1 and traits in English in each cell, the row total was multiplied to the column total and divided by the total number of traits the participant had used in the trait sort. Thus, for the expected frequency of traits in L1 in group A, I calculated (11*4)/20 = 2.2. Analog, the expected frequency for traits in English for group A was calculated by: (9*4)/20 = 1.8. Continuing with this procedure for each cell, the resulting expected values were displayed in a second contingency table

	A	B	C	D	E	∑
expected t_{L1}	2.2	3.85	2.2	1.1	1.65	11
expected $t_{English}$	1.8	3.15	1.8	0.9	1.35	9
T	4	7	4	2	3	20

Next, to obtain χ^2, the sum of squared differences between observed and expected frequencies in each cell was calculated.

	A	B	C	D	E	
	$(3 - 2.2)^2/2.2$	$(3.85 - 4)^2/3.85$	$(2.2 - 3)^2/2.2$	$(1.1 - 1)^2/1.1$	$(1.65 - 0)^2/1.65$	
	$(1 - 1.8)^2/2$	$(3.15 - 3)^2/3.15$	$(1.8 - 1)^2/1.8$	$(0.9 - 1)^2/0.9$	$(1.35 - 3)^2/1.35$	
						χ^2 = 4.99

The resulting χ^2- value was applied to the formula:

$$Cramér's\ V = \sqrt{\frac{4.99}{20}} = .50$$

resulting in a value of Cramer's V = .50, that means the sample person had used their languages as a principle to organize self-knowledge to a medium extend. Though, the compartmentalization of L1 and L2 self-knowledge across different self-aspects was not fully developed.

Proportion of traits in English (PropEng)

The proportion of traits in English used in the sorting task was obtained simply by calculating the row total of t_{L1} ($\sum t(\mathrm{L1})$) and dividing by the row total of T ($\sum T$).

For the sample trait sort, the resulting proportion of traits in English accordingly was 11/20 = .55 . The score the person received as a total share of traits in English displayed that he/she had used slightly more traits in English than in his/her L1 to describe him/herself.

	Self-aspects				
Traits	A	B	C	D	E
1 lazy					
2 industrious					
3 mature		X			
4 organisiert					
5 conformist					
6 humorvoll	X				
7 outgoing					
8 unfriendly					
9 nachdenklich				X	
10 durchsetzungsfähig	X				
11 entspannt	X	X			
12 neckisch					
13 weichherzig		X			
14 schweigsam					
15 rücksichtslos					
16 playful					
17 unzuverlässig					
18 konformistisch					
19 studious					
20 unanständig					
21 reserved					X
22 unfreundlich					
23 reflective					
24 zurückhaltend					
25 reckless					
26 rebellisch					
27 rude					
28 ideenreich					
29 gefühlsbetont					
30 impulsive	X	X			
31 unorganized					
32 unsicher					
33 insecure					X
34 assertive					
35 reif					
36 quiet					X
37 nicht fleißig					
38 soft-hearted					
39 individualistisch					
40 fleißig			X		
41 relaxed					
42 rebellious					
43 irresponsible					
44 anspruchsvoll		X	X		
45 unorganisiert					
46 unconventional					
47 competitive			X		
48 impulsiv					
49 oberflächlich					
50 humorous					
51 sophisticated					
52 affectionate					
53 kontaktfreudig					
54 arbeitsam			X		
55 anxious					
56 organized				X	
57 liebevoll		X			
58 shallow					
59 ängstlich					
60 imaginative					
61 not studious					
62 faul					
63 affective		X			
64 konkurrierend					
65 individualistic					
66 unkonventionell					
t_{L1}	**3**	**4**	**3**	**1**	**0**
$t_{English}$	**1**	**3**	**1**	**1**	**3**
T	**4**	**7**	**4**	**2**	**3**

APPENDIX B

Concerning Study 3, Study 4, and Study 5

Self-constructed C-Tests

As a test of participants' language proficiency, we assessed self-constructed C-tests. C-tests typically consist of short text passages, in which, starting from the second sentence the second half of every second word is removed and has to be filled in by participants. Conducting our research, we constructed C-tests in English, German, and Norwegian on the basis of text passages about the European Union retrieved from the webpage of the European Union (http://europa.eu/about-eu/eu-history/index_en.htm and http://europa.eu/about-eu/basic-information/eu-nobel/index_en.htm). The English and German version of the text were available. The Norwegian (Bokmål) version was translated forth and back by two native Norwegian speakers.

In the following, we present the resulting C-Tests versions that have been assessed in Study 3, Study 4, and Study 5 presented in this dissertation.

Table English version of self-constructed C-Tests

The history of the European Union

A peaceful Europe – the beginnings of cooperation

The European Union is set up with the aim of ending the frequent and bloody wars between neighbours, which culminated in the Second World War. As o_ 1950, the Euro____ Coal a__ Steel Comm_____ begins t_ unite Euro____ countries econo_____ and polit_____ in or___ to sec___ lasting pe___. The s__ founders a__ Belgium, Fra___, Germany, It___, Luxembourg a__ the Nethe_____. The 1950s a__ dominated b_ a co__ war bet____ east a__ west. Prot____ in Hun____ against t__ Communist reg___ are p__ down b_ Soviet ta___ in 1956; wh___ the foll_____ year, 1957, t__ Soviet Un___ takes t__ lead i_ the sp___ race, wh__ it laun____ the fi___ man-made sp___ satellite, Sputnik 1. Al__ in 1957, t__ Treaty o_ Rome cre____ the Euro____ Economic Comm_____ (EEC), or 'Common Market'.

Nobel Peace Prize 2012 awarded to European Union, one year on

In 2012 the EU received the Nobel Peace Prize for advancing the causes of peace, reconciliation, democracy and human rights in Europe. (…) When awar____ the No___ Peace Pr___ to t__ EU, t__ Norwegian No___ Committee sa__ its deci____ was ba___ on t__ stabilising ro__ the EU h__ played i_ transforming mo__ of Eur___ from a cont_____ of w__ to a cont_____ of pe___. The EU's mo__ important achie_____, according t_ the comm_____, has be__ "the succe_____ struggle f__ peace a__ reconciliation a__ for demo_____ and hu___ rights". T__ work o_ the EU repre_____ "fraternity bet____ nations" a__ amounts t_ a fo__ of t__ "peace congr_____" cited b_ Alfred Nobel a_ criteria f__ the Pe___ Prize i_ his 1895 wi__. The Euro____ Union i_ the 21st intern_____ organisation t_ win t__ award si___ 1901.

Table German version of self-constructed C-Tests

Die Geschichte der Europäischen Union

Ein friedliches Europa – die Anfänge der Zusammenarbeit

Die Europäische Union wurde mit dem Ziel gegründet, den häufigen und blutigen Kriegen zwischen Nachbarn ein Ende zu bereiten, die ihren Höhepunkt im Zweiten Weltkrieg gefunden hatten. Ab 1950 beg___ die Euro_____ Gemeinschaft f__ Kohle u__ Stahl, d__ Länder Eur____ wirtschaftlich u__ politisch z_ vereinen, u_ einen dauer_____ Frieden z_ gewährleisten. D__ Gründungsmitglieder wa___ Belgien, Deut_____, Frankreich, Ita____, Luxemburg u__ die Niede_____. Die 50er Ja___ standen un___ dem Zei____ des kal___ Krieges zwi_____ Ost u__ West. Pro_____ in Ung___ gegen d__ kommunistische Reg___ werden 1956 v__ sowjetischen Pan____ erstickt. E__ Jahr spä___, 1957, übernimmt d__ Sowjetunion d__ Führung i_ Wettlauf i_ All, a__ sie m__ Sputnik 1 d__ ersten künst_____ Erdsatelliten i_ eine Umlau_____ bringt. I_ gleichen Ja__ wird m__ dem Ver____ von Rom d__ Europäische Wirtschaftsgemeinschaft (EWG), d__ „Gemeinsame Ma___“, geschaffen.

Friedensnobelpreis – ein Jahr danach

2012 wurde die EU für ihren Einsatz für Frieden, Versöhnung, Demokratie und Menschenrechte in Europa mit dem Friedensnobelpreis ausgezeichnet. (…) Bei d__ Preisverleihung begrü____ das norwe_____ Nobelkomitee se___ Entscheidung m__ der stabilis_____ Rolle d__ EU b__ der Umwan_____ Europas v__ einem Kont_____ der Kri___ zu ei___ Kont_____ des Frie____. Die grö___ Errungenschaft d__ EU s__ „ihr erfolg_____ Kampf f__ Frieden, Versö_____, Demokratie u__ Menschenrechte.“ D__ Arbeit d__ EU ste___ eine „Verbrü_____ von Nati____“ dar u__ sei ei__ Form d__ von Alfred Nobel i_ seinem Vermä_____ von 1895 a__ Kriterien f__ den Friede_____ genannten „Friedens_____“. Die Europ____ Union i__ die 21. interna_____ Organisation, d__ den Pr___ seit 1901 erh___.

Table Norwegian (Bokmål) version of self-constructed C-Tests

Den Europeiske Unions historie

Et fredelig Europa - samarbeidet begynner

Den Europeiske Union opprettes med det formål om å gjøre slutt på mange av de blodige nabokrigene som kulminerte med andre verdenskrig. Fra o_ med 1950 begy____ en rek__ europeiske la__ å samar_____ økonomisk o_ politisk f__ å bev___ freden. Det__ skjer inne____ rammene t__ den Europ_____ kull- o_ stålunionen. D_ seks grunnl_____ er Bel___, Frankrike, Ita___, Luxembourg, Nede_____ og Tysk____. 1950-tallet pre___ av d__ kalde kri___ mellom østblok_____ og ves___ styresmakter. I Ung___ nedkjemper sovje_____ stridsvogner prot_____ mot kommuni_____ i 1956 o_ ett å_ senere, i 1957, t__ Sovjetunionen lede____ i romkap_____ ved å se___ ut s__ første sate____, Sputnik 1. I sa___ år under_____ Roma-traktaten, o_ danner d__ europ_____ økonomiske felle_____ (EEC), eller 'fellesm_____.'

EU får Nobels fredspris 2012, ett år etter

I 2012 mottok EU Nobels fredspris for sitt arbeid for fred, forsoning, demokrati og menneskerettigheter i Europa. (...) Ved tilde_____ av pri___, uttalte d__ norske Nobelk_____ at beslut_____ tok utgang_____ i d__ stabiliserende rol___ EU h__ spilt _ å omf____ det me___ av Eur___ fra e_ krigens t__ en fre____ kontinent. EUs vikt_____ resultat e_ ifølge komi____ "den vely_____ kampen f__ fred, fors_____, demokrati o_ menneskerettigheter." EUs virks_____ representerer "bror____ mellom nasj____" og utg___ en fo__ for "fredsko_____", noe s__ er e_ av krite_____ for _ kunne mo___ fredsprisen, _ tråd m__ Alfred Nobels testa_____ fra 1895. EU e_ den 21. interna_____ organisasjonen s__ har vun___ prisen si___ 1901.

VORVERÖFFENTLICHUNGEN

Zeitschriftenbeiträge

Gabriel, U., Lilla, N., Zander, L., & Hannover, B. (2014). How immigrant students' self-views at school relate to different patterns of first and second language use. *Social Psychology of Education, 17*(4), 617–636. https://doi.org/10.1007/s11218-014-9268-4

Kongressbeiträge und Posterpräsentationen

Gabriel, U., Lilla, N. & Hannover, B. (2012, September). *Erstsprachen-Selbst und Zweitsprachen-Selbst? Die kontextgebundene Verfügbarkeit sprachlichen Selbstwissens bei Schülerinnen und Schülern mit Migrationshintergrund*. Vortrag auf dem 47. Kongress der Deutschen Gesellschaft für Psychologie in Bielefeld, Deutschland.

Lilla, N., Gabriel, U., Zander, L. & Hannover, B. (2013, Juni). *Bilingual immigrant students' language-dependent accessibility of self-knowledge.* Poster präsentiert auf der Abschlusskonferenz des Marie Curie Initial Training Network on Language, Cognition and Gender in Bern, Schweiz.

Lilla, N., Hannover, B., & Zander, L. (2013, September). *Die Sprachgebundenheit domänenspezifischer Selbstwertaspekte. Ein Vergleich von bilingualen Jugendlichen mit kontextabhängigem oder kontextübergreifenden gleichem Sprachgebrauch.* Vortrag auf der 14. Fachgruppentagung Pädagogische Psychologie in Hildesheim, Deutschland.

Lilla, N., Gabriel, U., Zander, L. & Hannover, B. (2014, Februar). *Er jeg en annen than I am? – Bilingual students' language-dependent access of cognitive and affective self-knowledge.* Poster präsentiert auf dem NTNU Språkdagen 2014 in Trondheim, Norwegen.

Lilla, N., Gabriel, U., & Hannover, B. (2015, August). *Organization of self-knowledge and self-esteem stability. Revisiting the spill-over hypothesis.* Präsentation auf der 8th Biennial International SELF Conference in Kiel, Deutschland.

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AKADEMISCHER LEBENSLAUF

Mein Lebenslauf wird aus Gründen des Datenschutzes in der elektronischen Fassung meiner Arbeit nicht veröffentlicht.

ERKLÄRUNG

Hiermit versichere ich, die vorliegende Arbeit auf der Grundlage der angegebenen Hilfsmittel und Hilfen selbstständig verfasst zu haben. Die Arbeit ist nicht schon einmal in einem früheren Promotionsverfahren angenommen oder abgelehnt worden.

Berlin, im Januar 2017