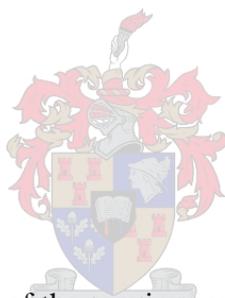


First Language Development in a Bilingual Setting: The Role of First Language
Contact

by Simone Gültzow



Thesis presented in partial fulfilment of the requirements for the degree of Master in Second
Language Studies, at Stellenbosch University

Supervisor: Dr. Emanuel Bylund

Faculty of Arts and Social Sciences
Department of General Linguistics

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Declaration

By submitting this thesis, I declare that the entirety of the work contained therein is my own original work, that I am the authorship owner thereof (unless to the extent explicitly otherwise stated) and that I have not in its entirety or in part submitted it for obtaining any qualification.

Simone Gultzow

15. February 2015

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Abstract

Moving to a new country often involves exposing oneself to new languages and cultures. Many individuals who move to another country and acquire a new language are sometimes at risk of losing the language of their country of origin. Studies in first language (L1) loss aim to describe what happens in an individual's L1 when he/she moves away or disconnects from its source as well as to explain which linguistic aspects change and why. The aim of this research paper is to investigate lexical proficiency in L1 German bilingual speakers residing in the Western Cape. Lexical data were elicited through a Verbal Fluency Task (VFT) and a Picture Naming Task (PNT). Particularly, the paper assesses the extent to which degree of German L1 contact influences lexical development, alongside other background factors (age of reduced L1 contact, length of residence in the L2, education level) and sociolinguistic factors (attitude towards the L1, language use and contact). Correlational analyses revealed that two types of contact factors were crucial for maintaining L1 lexical proficiency: 1) intense receptive input such as reading German books and other German visual media, and 2) exposure to German as a medium of instruction within an educational setting. Neither of these factors allow nor permit any code-switching or code-mixing and are considered to be a form of German monolingual input, thus cementing L1 knowledge and skills and proving to be beneficial for long-term language development and maintenance. Conclusions drawn from the results of the study are discussed in the final chapter and suggestions for future research are presented.

Opsomming

Die verhuising na 'n nuwe land sluit gewoonlik blootstelling van menself aan nuwe tale en kulture in. Baie individue wat na 'n ander land verhuis en 'n nuwe taal aanleer, loop soms die risiko om die taal van hulle land van herkoms, te verloor. Studies in eerste taal (L1) verlies het ten doel om te beskryf wat in 'n individu se L1 gebeur wanneer hy of sy verhuis of wegbreek van die bron asook om te verduidelik watter linguistiese aspekte verander of aanpas en waarom. Die doel van hierdie navorsing is om leksikale bevoegdheid in L1 Duitse tweetalige sprekers in die Wes-Kaap, te ondersoek. Leksikale data is deur 'n Verbale Vlotheid Taak (VFT) en 'n Prentjie Benaaming Taak (PNT) versamel. Meer spesifiek, assesser die navorsing die mate van die graad waartoe Duitse L1 kontak leksikale ontwikkeling beïnvloed tesame met ander agtergrondfaktore (ouderdom van verminderde L1 kontak, lengte van verblyf in die L2, onderrigvlak). Korrelatiewe analises dui daarop dat twee tipes kontakfaktore van uiterste belang was vir L1 leksikale bevoegdheid: 1) intense vatbare insette soos die lees van Duitse boeke en ander Duitse visuele media, en 2) blootstelling aan Duits as 'n medium van instruksie in 'n onderrigopset. Nie een van hierdie twee faktore laat enige kode-wisseling of kode-vermenging toe nie en is oorwegend 'n vorm van Duitse eentalige tevoer, dus word L1-kennis en-vaardighede vasgelê en bewys dat dit voordelig is vir langtermyn taalontwikeling en instandhouding. Gevolgtrekkings wat van die resultate van die studie gemaak is, word in die finale hoofstuk bespreek en voorstelle vir toekomstige navorsing word aangedui.

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List of Abbreviations

ATH	Activation Threshold Hypothesis
AoA	Age of Arrival
Att	Attitudes
CLI	Cross-linguistic influence
L1	First Language
L2	Second Language
LoR	Length of Residence
PNT	Picture Naming Task
SLA	Second Language Acquisition
UG	Universal Grammar
VFT	Verbal Fluency Task

1. Introduction

1.1 Introduction to the thesis

Moving to a new country often involves exposing oneself to new languages and cultures. Many individuals who move to another country and acquire a new language are sometimes at risk of losing the language of their country of origin. What is more, those individuals who were born to emigrant parents need to acquire and navigate, within the multitude of language communities, their language of origin. Studies in first language (L1) loss aim to describe the development of an individual's L1 when he/she moves away or disconnects from its source as well as to explain which linguistic aspects change and why (De Leeuw 2008). More specifically, research into L1 loss has focussed on particular domains of language, such as the lexis, amongst others (for a general overview, see Schmid & Köpcke 2004). The lexicon is assumed to be one of the most vulnerable and susceptible domains to L1 loss and second language (L2) influence. Investigating the L1 lexis in bilinguals thus provides an opportunity to shed some light on the development and maintenance of the L1 linguistic system in a L2 environment. The current thesis investigates these questions in a South African context. What is unique in this context is the diversity in cultures and languages that comprise the South African population. Amid the population is a fair percentage of European heritage and European (e)migrants residing in South Africa.

Among the European (e)migrants to South Africa, in particular the Western Cape, are the Germans. In fact, a large and well-established German-speaking community has settled in the Metropolitan Area of Cape Town. This community comprises schools, churches, social/sport clubs, TV channels, even medical and law practices as well as major German companies. The accessibility and availability to continue to use the first language (L1), for this group of people, in a second language (L2) English environment is nothing short of being 'German-like' with the convenience of German-owned and German-speaking facilities and services. What is more, according to the Constitution of the Republic of South African, the Pan South African Language Board was established not only "a) to promote, and create conditions for the development and use of all official languages, [but also] b) to promote and respect for all languages commonly used in South Africa, including German" (Republic of South Africa 1996), amongst others. As such, the German language and culture is welcomed in South Africa and, it is also recognised by the South African government to diversify the linguistic landscape and contribute to the 'make-up' of South Africa.

As strong as the presence of the German-speaking community in Cape Town may be, the development of German language skills in this context is not immune to L2 influence. An immersion into the L2 environment may be necessary as to maintain an adequate working and/or studying standard equal to native English/ Afrikaans speakers. With this change and/or shift into the L2, it is inevitable that language contact with and use of the L1 will diminish, which in turn can lead to L1 loss. Whereas it is commonly assumed that language loss can be attributed to the disuse of the L1, research on this topic shows that the role of L1 contact for L1 retention and maintenance is not straightforward. Whereas some studies (De Leeuw, Schmid & Mennen 2010; Hulsen 2000; Ribbert & Kuiken 2010; Schmid & Dusseldorp 2010) have attributed language loss to the lack of L1 contact, others (Schmid 2007) have failed to document an independent, predictive power of this variable. Though the evidence to date may be mixed, researchers nonetheless agree that the lexicon is susceptible and becomes vulnerable to L1 contact situations and other influences.

It is therefore the purpose of this investigation to elicit lexical proficiency data by means of a Verbal Fluency Task (VFT) and a Picture Naming Task (PNT), with the intention of assessing the role of L1 contact for L1 lexical development and maintenance among German L1 speakers residing in the Western Cape, whilst simultaneously examining the impact of the speaker's background (age of reduced L1 contact, length of residence in the L2, education level) and sociolinguistic factors (attitude towards the L1, language use and contact) on maintaining and developing the L1 linguistic skills. This will allow us to test the observation that L1 contact is crucial for lexical development while at the same time keeping track of the influence of other potential factors.

1.2 Outline of the thesis

The thesis is structured as follows. Chapter 2 presents an overview of previous studies on bilingualism and L1 development in an L2-dominant setting in bilinguals. It first contextualises the study within bilingualism, focussing on language development and language loss, the language mode continuum (Grosjean 2001) and crosslinguistic influences. Afterwards, the chapter discusses attrition and incomplete acquisition, describing both phenomena as branches of language loss. This is followed by a discussion on the different predictor variables in language loss research.

Chapter 3 gives a brief description of the most prevalent theoretical models attempting to account for the processes involved in L1 loss. The first section gives an outline of theoretical models such as the Interlanguage hypothesis, Regression hypothesis, Dynamic System Theory as well as the Universal Grammar hypothesis, the Ethnolinguistic Vitality Theory and the Social Network Theory. The rest of the chapter goes on to describe the Activation Threshold Hypothesis in detail, particularly focussing on the phenomenon of language loss and incomplete acquisition.

Chapter 4 introduces the aim of the current study and then describes the methods used to investigate the topic at hand. Afterwards, it explains the criteria and methods used to select the participants followed by a description of the test battery. The testing battery included a sociolinguistic and background questionnaire and three formal tests — Picture Naming Task, Verbal Fluency Task and a C-test.

Chapter 5 presents the results obtained from the tests and Chapter 6 provides a discussion on these findings. The overall findings of the current research suggest that two types of contact factors were crucial for L1 lexical proficiency and development, namely ‘Non-interactive L1 contact’ and ‘Education’.

Chapter 7 offers a conclusion and outlines the limitations of the study and its materials as well as suggestions for future research. Overall it is concluded that the study of L1 development in a bilingual context is crucial in further understanding the constant growth and expansion of the world’s bilingual population.

2. LITERATURE REVIEW

2.1 Introduction

The current chapter aims to highlight some of the prevalent literature in language loss within the broader context of bilingualism and SLA (Second Language Acquisition) and to specifically review the predictor variables pertaining to L1 development in a bilingual setting. The first section (2.2) of the chapter deals with a general overview of bilingualism and highlights some key concepts to contextualise the current study. The second part (2.3) will define and discuss the linguistic phenomena of attrition and incomplete acquisition. The following section (2.4) in this chapter will review some of the pertinent findings in the research of language loss to date that correspond with the current study, as well as discuss the main predictor variables attributed to the process of L1 development. The last section will give a summary of the literature discussed in this chapter.

2.2 L1 development in a L2 context

Within the scope of language loss research and SLA there are two basic terms that require familiarisation — L1 and L2. The L1 (first language) refers to the first language an individual acquires. On the other hand, the L2 (second language) refers to the learning and acquisition of any other language after the L1. These two terms are chronological terms and do not reflect language proficiency or dominance. Nowadays, there are an increasing number of cases where a L1 speaker finds himself/herself in a L2 setting. Moreover, the transition of settings will affect how the L1 develops since the speaker will have reduced opportunities to use and be in contact with the L1, and such language disuse may lead to gradual language loss. Furthermore, the more frequently used L2 items will replace their (less used) L1 equivalents. Whether it is attrition or acquisition, the L1 “is different in many ways from any other abstract system of knowledge human beings possess, and different in specific ways from any language that is learned later in life” (Schmid & Köpke, 2007:1). The implication is that the L1’s linguistic system is uniquely structured, based on an innate blueprint of language principles and is irreproducible. Learning multiple languages is possible, yet the L2 cannot take root on the L1’s ‘blueprint’. However,

within the process of learning another language the L1 becomes vulnerable to interference from the L2.

2.2.1 Language loss in bilingualism

The majority of language loss literature (see, De Bot, et al. 1991; Schmid 2007; Schmid 2010; Schmid 2011b; Köpke 2004a, b) contextualises itself within the realm of bilingualism. In fact, Seliger (1991:227) asserts that L1 loss is “a ubiquitous phenomenon found wherever there is bilingualism”. The advent of an L2 not only fundamentally changes the L1, but it also shapes the bilingual’s mind to process language(s) in a different way (Schmid & Köpke 2007). Bilingualism, according to Seliger and Vago (1991:3), is a natural setting for the unravelling of native language proficiencies and capabilities. Subsequently, the L2 as well as the setting or environment of the L1, may affect the loss of the L1. Van Els (1986) (as cited in De Bot, Gommings and Rossing 1991:87) suggested a taxonomy which references what is lost – either the L1 or the L2- and in what setting it is lost – an L1 environment or an L2 environment. Cherciov (2010:17) summarises the four types of language loss as follows:

1. loss of an L1 in an L1 environment (e.g., dialect loss)
2. loss of an L1 in an L2 environment (e.g., loss of a native language by immigrants)
3. loss of an L2 in an L1 environment (e.g., loss of a foreign language)
4. loss of an L2 in an L2 environment (e.g., loss of a second language by aging migrants)

The current study falls within the second category; L1 loss in an L2 environment. This is also the most commonly investigated category in the study of language loss. The transition from a monolingual setting to a bilingual, even multilingual, setting expects a restructuring of the linguistic system(s). Gross (2004:3) highlights that L1 loss “is the restructuring of the L1 linguistic system according to patterns established by the second language”. This raises the issue of L1 change and L2 interference. The increased exposure to the L2 and the disuse of the L1 will lead to a restructuring of the individual’s L1 knowledge. However, the change is not instantaneous nor is it sudden, but it begins gradually and selectively. In fact, Grosjean (2001) proposes a model that consists of different language modes, depicting the transition from a monolingual language mode to a bilingual language mode. Similarly to Seliger (1991) and Chericov (2010), Schmid (2007) emphasizes that there are certain degrees and levels to a linguistic system that can be activated. Grosjean’s (2001) model describes a language mode

continuum, where on the one end is the monolingual language mode (only one language is activated) and on the other the bilingual language mode (both languages are activated), and in between the intermediate modes (one language is activated, but the other is not entirely inhibited) (Schmid 2007:138). What should become evident is that there is a variety of language mode settings for the bilingual to operate in.

According to Grosjean (2001) there are five types of L1 use within bilingualism:

- Type I: largely monolingual use of L1
- Type II: intermediate mode
- Type III: bilingual mode
- Type IV: intermediate mode
- Type V: largely monolingual use of L2

Schmid (2007) adopted and adapted Grosjean's (2001) model and summarised the five types according to the use and the context of use as follows:

- Type I: monolingual mode L1 use (distant communication with home country)
- Type II: intermediate mode L1 use (professional L1 use and in social clubs, churches, etc.)
- Type III: bilingual mode L1 or L2 use (L1 use with family, friends and acquaintances)
- Type IV: intermediate mode L2 use (L2 use with emigrants acquiring L2)
- Type V: monolingual mode L2 use (L2 use with monolingual speakers)

Both Grosjean's (2001) model of L1 use and Schmid's (2007) adaptation of the language model, may serve to improve the understanding of the context and participants of the present study.

Stage/Type I is representative of only using the L1 in a monolingual mode. Communication takes place between two L1 monolingual speakers and for that reason little, if any, interference from an L2 will be present. The 'Type I' mode is representative of communication with the country of origin, where the interlocutors have no knowledge of the L2; therefore communication will be strictly in the monolingual mode.

Stage/Type II is representative of an intermediate use of the L1 mode. Typical communication takes place between two monolingual speakers who do however have knowledge of the L2, yet the use of it at this stage is considered inappropriate. The 'Type II' mode is representative of communication in an L1 professional situation, such as communication with L1 monolingual speakers, and these interlocutors have no knowledge of the L2. Also, the 'Type II' mode can be seen at L1 social clubs, churches and schools.

Stage/Type III is representative of the bilingual use of both the L1 and the L2. At this point, communication takes place between two interlocutors who have equal knowledge of the L1 and the L2. Communication, at this stage, takes place between family members, friends and acquaintances who all have knowledge of the L1 and the L2, and may even use them simultaneously, i.e. by means of codeswitching and code mixing.

Stage/Type IV is representative of an intermediate use of the L2 mode. Communication in this mode takes place between an L2 speaker and another speaker acquiring the L2 or when both monolinguals and bilinguals engage in one conversation (Schmid 2007). Communication will therefore be mixed and both L1 and L2 may be used simultaneously.

Stage/Type V is representative of using the L2 monolingual mode. Communication takes place between two monolingual L2 speakers or L2 use with native speakers who do not know the L1. Schmid (2007) notes that this is a common language use situation in daily life for bilinguals. In other words, this stage is representative of well-integrated immigrants whose proficiency is high and their use of their L1 is limited, if not unnecessary.

In view of the two above models of Grosjean (2001) and Schmid (2007), both highlighting the different language use modes, and the above synthesis of the two models, it may be deduced that the bilingual speaker is constantly moving between various points of the language mode continuum. What is more, Grosjean (2001:30) insists that all researchers in bilingualism need to take into account the different language modes, as these modes "give a truer reflection of how bilinguals process their two languages, separately or together [...], and it can partly account for problematic or ambiguous findings relating to such topics as language representation and processing, interference, code-switching, language mixing, etc."

The before mentioned aspects of bilingualism are imperative to be aware of and understand for the context of the current study. Given that all participants are currently living in a bilingual, if not multilingual, context and depending on their linguistic experiences, it is likely that each participant will be situated differently on the language mode continuum. It is predicted that a

heterogeneous group will emerge, demonstrating a unique circumstance in that the participants' L1 is not only changing due to the L2 (English/Afrikaans) but also due to various degrees of language contact situations promoting or hindering L1 proficiency and maintenance.

2.2.2 Crosslinguistic influence

Cook (2003) (as cited in Schmid & Köpke 2007:3) suggests that the acquisition of an L2 at any point in an individual's lifespan will fundamentally and irrevocably change the L1 linguistic system. In SLA, it is commonly assumed that the L1 influences the L2 in the process of L2 learning, while at the onset of bilingualism it is the L2 that influences the L1. These processes, whereby one language influences another, are subsumed under the term 'cross linguistic influence'. What is important to recognise is that it is in fact a bi-directional current which shapes and reconstructs the L1, and ultimately establishes a bilingual language system (Schmid & Köpke 2007). In the context of defining and identifying crosslinguistic influence, it is important to keep in mind that not all instances of L2 elements influencing the L1 can be taken as signs of language loss. However, the L2 influence may impede the language development in several ways. Pavlenko (2007) has pointed out that there are several processes that affect the interaction between two languages such as borrowing and attrition amongst others.

The motivation to in fact add new items to one's mental vocabulary in an L2 setting is to name new objects; perhaps there is no equivalent word or translation in the L1. According to Pavlenko (2007:48), this might not be an overt sign of L1 loss, but an "enrichment of the bilingual's linguistic and conceptual repertoire". Furthermore, Pavlenko (2007) points out that when no translation equivalent for an item can be found in the L1 lexis, neither a direct translation nor a loan translation from the L2 can be regarded as direct language loss. Consequently, Pavlenko (2007) reiterates the importance of distinguishing overt language loss from lexical borrowing. With this she proposes that any sign of L1 loss, within the lexis, should be scrutinized and examined closely explaining that lexical borrowing is evidence of L1 loss. Moreover, Pavlenko (2007) proposed that the researcher must implement a methodology that minimises the risk of confounding lexical borrowing and language loss.

Schmid (2011a) raises the issue, which is relevant to the present study, of L1 items that have been lost to the speaker and those items which they had never known in the first place. Much of these 'unknown' items develop due to the context of work and a professional life, as well as hobbies and local flora, fauna and animals. Stolberg and Münch's (2010) longitudinal study reveals that their participant was able to converse freely on multiple 'basic' subjects such as

childhood, experiences of World War II, emigration process, life in the USA, etc., and yet, lexical borrowing was persistent in her discussion of art work (hobby) and her health.

Both Pavlenko's (2007) and Schmid's (2011a) conclusion, as well Stolberg and Münchs' (2010) finding, highlight that lexical borrowing is not as straightforward to pin-point as one might expect within bilingualism. It further raises the question as to what factors affect the L1 lexis up to a point where the bilingual no longer has access to a particular item. Seliger and Vago (1991:10) proposed, within the context of cross-linguistic interference (from the L2), that there are external influences (i.e. lexical borrowing) and internal changes (i.e. modifications of linguistic forms, such as simplification) that may be characterised as manifestations of language loss.

2.3 Differentiating between attrition and incomplete acquisition

As already alluded to in the above discussion, within bilingualism there are several terms describing the concept of language loss. In fact, language loss may be used as an umbrella term which covers the phenomena of attrition, incomplete acquisition, language death and language change (Montrul 2004). For the purpose of this paper, language loss encompasses attrition and incomplete acquisition.

There is an important distinction that needs to be made regarding attrition and incomplete acquisition. Schmid (2011a) points out that the study of language attrition has had difficulties drawing the line between attrition and incomplete acquisition. Seeing that some migrants immigrated at a young age or were born to migrant parents, it becomes difficult to determine whether the L1 was acquired fully before the break with the L1 setting. As we will see, the language proficiencies of attriters and incomplete learners follow different developmental trajectories.

Figure 2.1 below, illustrates the developmental process of acquiring language proficiency for L1 attriters. Language acquisition starts in a monolingual setting and reaches its full attainment at a certain point in time (usually around puberty). Afterwards the language stabilises until the speaker arrives in a L2 environment and contact with the dominant L2 begins. The change of a linguistic environment, with reduced L1 contact and L2 immersion, subsequently starts to affect the linguistic systems of the L1 and L2.

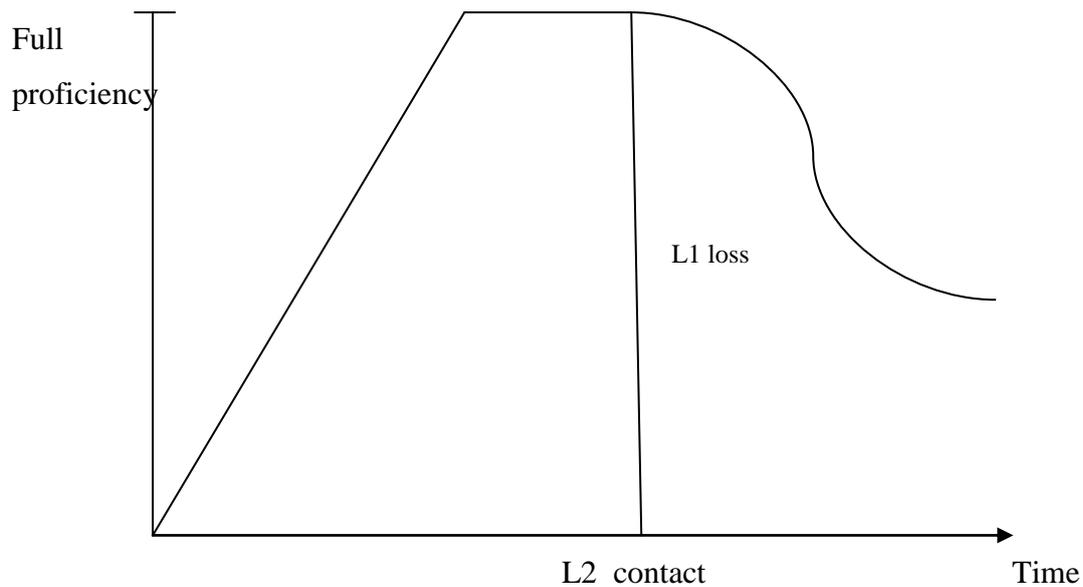


Figure 2.1 Language attainment in L1 attriters (adapted from De Bot 1998)

In contrast, Figure 2.2 demonstrates the developmental process of an incomplete L1 speaker. There are three possible continuations of the incomplete acquisition scenarios. The first trajectory (the line at the bottom) describes a learner acquiring the L1 yet the acquisition process is interrupted with commencement of L2 contact, and eventually language loss (i.e. attrition) sets in. The second trajectory (the middle line) depicts a learner acquiring the L1 and at the onset of the L2 contact, the incomplete acquisition process and the proficiency level stabilizes yet no further development is prompted. Lastly, the third trajectory (the line at the top) represents a learner continually acquiring the L1, even with the onset of L2 contact, but never fully attaining L1 proficiency. At one stage, all three trajectories intersect with the onset of L2 contact, therefore interrupting the L1 acquisition process and acquiring two languages simultaneously. At this point, L1 input is crucial in the development of the L1 and a lack thereof may result in languages loss. Evidently, incomplete L1 learners never reach full L1 proficiency and this therefore suggests that the activation and retrieval of a linguistic item (i.e. lexical item) is only possible if such an item had been *fully* acquired and frequently used.

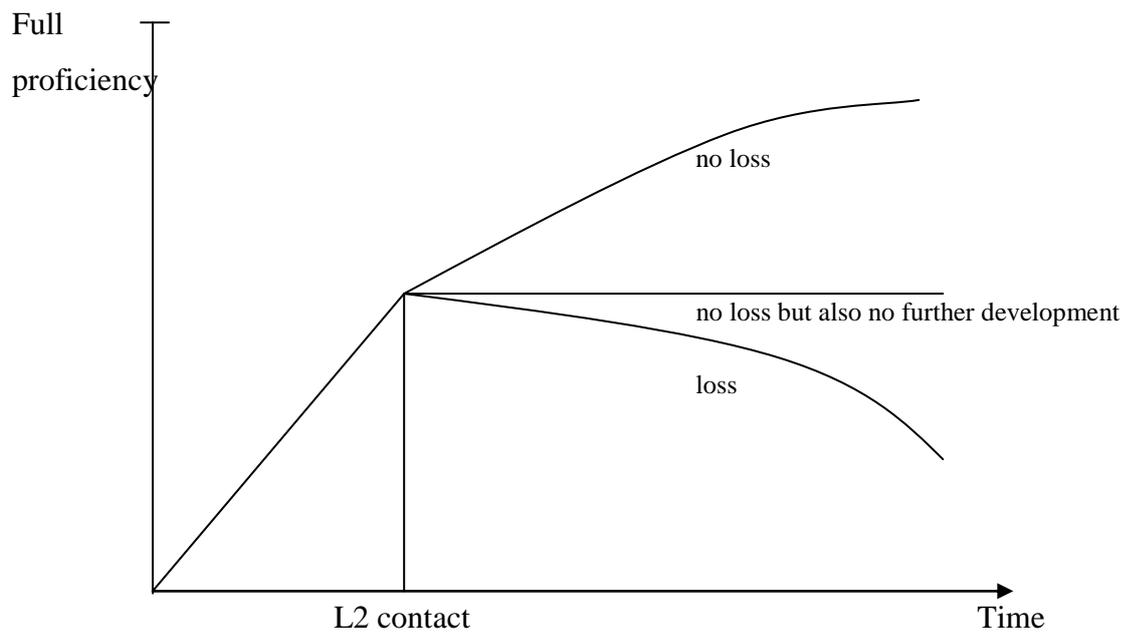


Figure 2.2 Language attainment in incomplete L1 acquisition speakers (adapted and modified from De Bot 1998)

Therefore, a difference between attrition and incomplete acquisition is that attriters have lost (part) of their acquired language skills, while for incomplete L1 learners these language skills were never there or have never fully been mastered. Another alleged difference between attrition and incomplete acquisition is that incomplete acquisition affects language at the performance and competence level, while L1 attrition merely affects language at the performance level (Montrul 2008). At some point a linguistic item had a level of activation that allowed for easy and fast access for an attriter, whereas this may not be the case for an incomplete L1 speaker, for whom, once again, a linguistic item may never have been fully acquired (de Bot 1998).

While the difference between attrition and incomplete acquisition is now well established there are similarities too. For example, a similarity between attrition and incomplete acquisition is that both situations are affected and characterised by the presence of another language, usually the dominant language used in most L2 settings (De Bot 1998). Another similarity is that both language users experience difficulties in lexical retrieval due to insufficient exposure and access to the L1 which leads to language loss.

With this in mind, the aim of the study is to investigate the influence of L1 contact in the development of the L1 lexis in an L2 setting. In other words, the focus will be on the language contact with the L1 (German) and how this accelerates, amplifies or even decreases the effects of language loss.

2.3.1 Defining L1 attrition

Reaching a consensus on a definition of language attrition has had many diligent researchers intrigued as well as perplexed. Nevertheless, researchers started to slowly tease out a possible definition by differentiating what language loss is and what it is not. A common starting place was to build on previous or existing definitions within their own field and other fields such as, psychology and sociology, amongst others, and from different approaches (Köpke 2004b). Köpke (2004b:1337) distinguishes between linguistic approaches, sociolinguistic approaches and psycho-or neurolinguistic approaches, suggesting that the differences in definition depend on the researcher's point of view and what aspect s/he is researching. However, in language attrition there are several characteristics that are certain. Looking at the following definitions will elucidate such characteristics of language attrition.

Hulsen (2000:4) refines her definition by distinguishing between language shift and language attrition highlighting that “language shift is taken to refer to a decline of language proficiency at a group level and that language attrition reflects a decrease in language proficiency at the individual level”.

Köpke (2004a:3) simplifies the definition of language attrition as “the non-pathological loss of a language in, usually, bilingual subjects”.

Keijzer (2007:13) points out that language attrition is the “erosion in healthy adults after a change in their personal, linguistic situation”.

Montrul (2008:64-65) explains that “attrition appears to affect structural aspects of the L1 as a result of language shift, or a change in the relative use of the L1 and the L2” whereas “attrition in adults affects primarily performance (retrieval, processing, and speed).”

De Leeuw (2008:10) elaborates on the before mentioned definition by emphasising language attrition as the “non-pathological, non-age related, structural loss of a first language within a late consecutive bilingual, assuming that the acquisition of the first language precedes its loss”.

From the above mentioned definitions it is evident that there is variation, however there are distinct commonalities and similarities within all. Firstly, language loss/attrition seems to be more of an ‘umbrella term’ and could be deemed broad and unspecific. Yet, from the selection of the above mentioned definitions, commonalities are made. The term ‘loss’ could imply two things. Firstly, it refers to a shift from one language to another language within generations of a community and/or to a complete death or extinction of a language, and secondly the term is used

to refer to a pathological inquiry, such as aphasia, by an individual and/or language attrition in a healthy individual (Schmid 2011a:3). A consensus can be reached that language attrition is a phenomenon that occurs within a healthy, non-pathological individual is first acquired language. This assumption is corroborated by Schmid and Köpke (2004:5), who defined language attrition as a non-pathological deterioration in proficiency in a language that had already been acquired by an individual. Schmid (2008:10) further elaborates on this explanation and expands it, stating that:

[...] attrition investigates the situation where a speaker (of an L1 or a later learned second or foreign language) can no longer do something which s/he had previously been able to do, and this loss of proficiency is not caused by a deterioration of the brain due to age, illness or injury, but by a change in linguistic behaviour due to a severance of the contact with the community in which the language is spoken.

Schmid's (2008) explanation grants a better overview of attrition, yet does not explicitly address the environment in which the loss takes place nor that the definition take into account the L1 proficiency level that seems to be impaired.

As a result, Cherciov (2010:19) proposes the following definition, expanding on the importance of the setting or environment of L1 attrition:

Non-pathological L1 attrition in an adult speaker living in an L2-dominant environment is considered to be a matter of both L1 reduced accessibility to linguistic knowledge and L1 restructuring according to L2 patterns, which can occur at any linguistic level in using any linguistic skill to the extent that communication in the L1 is impaired.

Cherciov's definition incorporates crucial aspects of L1 attrition that were evident in the above mentioned definitions. As has already been mentioned, L1 attrition refers to a non-pathological individual whose L1 proficiency has been impaired. Köpke (2004a), Keijzer (2007), Schmid (2008), Montrul (2008) and de Leeuw (2009) all point out that this impairment is due to a linguistic change, a change that was brought on by departing the L1 environment and living in a bilingual context (Köpke 2004a; Cherciov 2010). While Cherciov (2010) explicitly mentions that attrition affects linguistic knowledge (i.e. competence), Montrul (2008) clarifies that attrition, in adults only, affects performance, such as (lexical) retrieval, processing and speed. Montrul's statement is corroborated by Köpke's (2004a) investigation of the competence/performance issue within a psycho-neurolinguistic framework highlighting that

when an adult reduces their use of the L1 in an L2 context, it is a ‘performance attrition’ whereas the competence, the linguistic knowledge, is raised on the basis of the activation threshold function (see chapter 3 for more detail). As mentioned above, Köpke (2004b:1377) clarifies there are key characteristics to defining language attrition. In sum, the definition needs to include the following: non-pathological, intragenerational (linguistic skills within an individual, not group) language loss affecting linguistic performance.

From the above discussion it is clear that defining L1 attrition is far from straightforward, as current definitions diverge in their scope and emphases. In addition, it needs to be remembered that language attrition is a gradation. In other words, there are different levels of attrition. Whether it be the lexicon or the morphosyntax, attrition is a phenomenon experienced, to some degree, by all speakers living in a bilingual setting and affects language gradually and selectively (Seliger 1991; Cherciov 2010). Therefore, for the purpose of the present paper a definition will be used combining Cherciov’s (2010), Köpke’s (2004a, b) and Montrul’s (2008) definition on L1 attrition:

Non-pathological L1 attrition in an adult speaker living in an L2-dominant environment is considered to be a matter of both L1 reduced accessibility to linguistic knowledge, specifically the performance aspect, L1 restructuring according to L2 patterns, and affecting bilingual speakers.

While the above definition better clarifies the attrition aspect of the present paper, the issue of incomplete L1 acquisition warrants some further investigation and clarification.

2.3.2 Defining incomplete acquisition (and heritage language development)

In contrast to the field of attrition, there is a much greater consensus among scholars regarding the notion of incomplete acquisition. As a leading scholar in this field, Montrul (2008:21) outlines incomplete L1 acquisition as an occurrence which starts in childhood. The young L1 speaker does not have the chance to reach the age-appropriate levels of L1 proficiency before exposure to the L2 begins. As a result, incomplete acquisition, which started in childhood, will most likely continue into adulthood. Furthermore, Montrul (2008:21) clearly distinguishes between L1 attrition from incomplete L1 acquisition. L1 attrition, whether it occurs during childhood or adulthood, is the loss of an acquired property of the L1 after set property has been fully mastered with native-like proficiency and accuracy and has remained stable for a considerable amount of time. In addition, L1 attriters, at some point, had a level of activation

that made it easy and fast to retrieve linguistic elements (i.e. words) while incomplete L1 learners never reached such a point of retrieval level (de Bot 1998). In other words, one of the key attributes to incomplete acquisition is that if a speaker does not receive full L1 exposure throughout the critical period, L1 knowledge may never really stabilise in the way it does if L1 exposure and contact is not reduced during this period.

In order to attain native proficiency and develop the L1, the speaker needs not only exposure from birth onwards, but also during and throughout the critical period (Bylund & Diaz 2012; Montrul 2008). Therefore, a crucial input factor for L1 development is schooling. Within this setting, young speakers are exposed to language in a variety of genres for different purposes on a regular basis, which helps them to develop certain linguistic skills. Literacy skills lead to a higher resistance to attrition (Köpke 2004a). In fact, literacy and written L1 input is crucial in continuing to develop and shape language development. A lack of literacy could explain why some language aspects, such as word finding difficulty, would appear incomplete in adulthood (Montrul 2008:219). Literacy skills development, during and throughout the critical period, are beneficial and necessary in resisting and counterweighing language loss and promoting L1 development, even in an L2 dominant setting (Bylund 2014; Bylund & Diaz 2012; Chericiov 2010; Köpke 2004; Montrul 2008).

A further input factor is that of a L1 community. In fact, the absence of a broader L1 speech community cannot sufficiently be compensated for by the input from only one parent or the home language to help the child develop and maintain full linguistic ability in the L1 (Montrul 2008:102). Bilingual speakers who fall into the latter descriptions are those of immigrant parents (i.e. second generation bilinguals). This group runs a higher risk of developing incomplete linguistic knowledge since they did not have a chance to receive an extensive amount of input, exposure and use of the L1 language (Montrul 2008). As a result, maintenance of the L1 may be much more difficult, as “exposure and language use both contribute to solidify linguistic competence” (Montrul 2008:193).

Bilingualism necessitates, at least, the basic knowledge of two languages in an individual to “play and learn from each other” (Schmid 2010:1). Within a South African context this becomes not just a requirement but an inevitability, since the majority of individuals become bilinguals by default. For one, simultaneous bilingualism occurs in early childhood, before the linguistic foundations of the languages are cemented. These languages develop together at the same time,

hence simultaneous bilinguals; also known as *bilingual L1 acquisition*. On the other hand, sequential bilingualism can occur during early childhood or late in adulthood. Typically sequential bilingualism occurs after the individual has acquired the basic knowledge of the L1. Montrul (2008) likens sequential bilingualism to child L2 acquisition in an L2 acquisition context: language acquisition is sequentially ordered. What is more, both simultaneous and sequential bilingualism rest on the common foundation that the L1 develops in a bilingual (perhaps even multilingual) language setting (Montrul, 2008). This developing L1 is often referred to as a *heritage language*. Because of the multifaceted setting (i.e. South Africa), a heterogeneous group is created, where some may be very proficient in their L1 while others may be more “receptive bilinguals, who seldom speak the language, let alone read it” (Montrul 2008:193).

Ideally, research on incomplete L1 acquisition in adults should involve a longitudinal study, documenting the linguistic changes over time. However, because of practical reasons, researchers have either utilised monolingual speakers as their baseline of comparison or they have used first generation immigrants as their baseline group, such as was done by Hulsen (2000). Alternatively, it has been proposed that incomplete learners may be studied as an independent group, given their specific circumstances of language acquisition, without any comparisons to other groups (Cook 2003).

2.4 Predictor variables for L1 loss in a L2 context

Language loss affects all of the different linguistic domains that constitute a language, such as the lexicon, morphology, syntax, phonetics and phonology. In addition, language loss is considered a rule-governed and selective process which does not affect the language system at random but rather affects the different linguistic domains to different degrees and in different orders (Bylund 2009). As pointed out above, the linguistic domain that is most affected and most vulnerable to language loss is the lexicon. Not only is it the most vulnerable, it is also the first domain where any attrition effects may be found; this is usually manifested in lexical retrieval difficulties (i.e., problems in finding specific words). As such, the lexicon has become an area of great interest and the predominant domain in investigating L2 influence on L1 (Schmid, 2004:330). Subsequently, the lexicon has been characterized as an ‘open class system’, which allows for a certain amount of change, interference and loss. The degree to which the lexicon may undergo loss can be predicted by various variables such as age of reduced L1 contact,

educational level, length of residence, attitude towards L1 and L1 contact. In fact, Schmid and Köpke (2007:3) assert that these predictor variables are to be seen as “necessary conditions [that] have to be satisfied” in order for any language loss to set in. The extralinguistic variables which determine the conditions and the extent to which the L1 lexical skills may diminish in a L2 setting will be discussed in the following sections respectively.

2.4.1 Age of reduced L1 contact

In general terms it can be said that the age of reduced L1 contact generally coincides with the age at onset of L2 acquisition (Montrul 2008). What this means is that the age at which an individual loses contact with their L1 and is exposed to a new language is usually assumed to be the age of onset of bilingualism. The age of reduced L1 contact (commonly equated in language loss studies with the onset of L2 acquisition) is a key variable in L1 development in a L2 setting. Children are prone to show rapid and severe language loss if they lose contact with the language. Consequently, the earlier the onset of bilingualism (i.e. acquisition of another language) and the earlier a child starts being exposed to and using the L2 more than the L1, the more severe and dramatic the loss of the L1 is expected to be (Montrul 2008).

Studies have attempted to determine the effect and the role of ‘age of emigration’ in L1 loss. Bylund (2009) conducted a study which showed that the L1 stabilises around the age of 12 years. In this study, Bylund (2009) predicted that if the onset of bilingualism takes place at an early stage in life, the linguistic system of the native language may deteriorate more severely than those instances later in life, i.e. after puberty. In other words, on the one hand, the loss of L1 contact before puberty (i.e. before 12 years of age) would affect the language skills of the speaker and the language would not be fully stabilized. This in turn renders the L1 language system vulnerable to interference, change and loss in linguistic domains such as the lexicon, syntax and morphology. On the other hand, the loss of L1 contact after puberty (i.e. after 12 years of age) would not affect the language skills of the speaker less dramatically since the skills have been consolidated and no longer need extensive contact and input in order to remain stabilized. In the case of L1 loss in children who either grew up in a bilingual context or immigrated to an L2 environment before the age of 12 years, the age of reduced L1 contact factor may denote attrition, but it may actually be the result of incomplete (L1) acquisition (Bylund 2009; Montrul 2008).

In contrast, L1 loss in adults affects the language system to a lesser extent than in children. In adult bilinguals, the command of the L1 has been fully consolidated and stabilized thus having preserved the fundamental linguistic skills of the L1. Adult bilinguals retain a high proficiency in their L1, yet most frequently language loss in this (adult) group (as in children) manifests itself first in the lexicon (Montrul 2008:67).

While age or age of reduced L1 contact is a variable to consider, studies which investigate “the age factor [are] extremely rare” (Schmid 2011a:73). Investigations (Ammerlaan 1996; Pelc 2001; Schmitt 2001) on age effects show that age of L2 acquisition is in fact one of the most important predictor variables. A study by Dostert (2009) revealed the ‘age at emigration’ to be an important predictor variable. Dostert (2009) explored L1 English speakers in an L2 German environment. In this study, Dostert (2009) investigates the idea of what is a ‘native speaker’ and what factors influence the loss of a ‘native tongue’. Factors that influence the L1 according to Dostert (2009:19-22) are age, social environment, language use/contact with the L1 and L2, length of residence, education, attitude and motivation, and even number of languages spoken. Length of residence was an influential factor as it affects both formal and spoken tasks, whereas an advanced age at emigration correlates to a weaker performance in both languages for the L1 English speaker in Germany. The results further indicated the ‘age’ variable correlated with a poorer performance in the German Cloze-test (C- test). In other words, ‘age of emigration’ and ‘length of residence’ demonstrated to be two significant variables predicting language loss. They demonstrate that they are two variable influencing each other and also affirming the assumption that when a bilingual is immersed in the L2 setting the possibility of using and being exposed to the L1 may be limited.

A more recent study by Bylund (2014) investigated the factors predicting the use of English loanwords in bilinguals’ L1 (isiXhosa) development in the greater Cape Town area. The age of arrival factor revealed that participants either born in or moved to the greater Cape Town area were prone to use English loanwords (Bylund 2014). According to Bylund (2014) the age of arrival effect is either due to incomplete acquisition or an age-related susceptibility to language loss (i.e. young speakers’ exposure to the L1 is severed, thus this group undergoes more severe language loss than older speakers). This study showed, the age of arrival (or age of reduced L1 contact) in a L2 setting exercises a fairly significant effect on L1 proficiency and development.

A different approach was used by Schmid and Keijzer (2009). The authors investigated L1 loss in elderly migrants and hypothesised a reversion of language dominance: with age the L2

recedes and the L1 becomes stronger again. Schmid and Keijzer (2009) predicted that the retirement age group would show the largest signs of L1 loss and not the oldest group of participants. The predictions were correct. The results indicated that the oldest migrant group outperformed the other group highlighting that the migrants with the longest length of residence showed the least language loss. Although the ‘age factor’ is used in an unconventional way, determining the effect of language loss amongst an elderly population and possible reversion to L1 dominance, the results shed light on the non-linear and selective effects of language loss as a whole.

In sum, the age of reduced L1 contact or age of emigration is an important variable to consider as it determines the onset of bilingualism (i.e. L2 acquisition) and the onset of language loss. For some, bilingual acquisition starts early or simultaneously to acquiring the L1, while others only start the L2 acquisition process later in life, far past maturity. What is significant is that the age factor is one of the variables that demarcate the decline in L1 proficiency. Moreover, the *age* factor plays a crucial role in the distinction of attrition and incomplete acquisition. Simply put, it can be assumed that a speaker who arrived in the L2 environment at a very young age and exhibited deviating L1 proficiency will more likely be an incomplete L1 learner than a L1 attriter.

2.4.2 Length of Residence (in the L2 context)

Length of residence denotes the amount of time elapsed without L1 contact since it is commonly assumed that language loss is a process that manifests itself over time. For this reason, it is often assumed that the time spent living in an L2 environment will exert some influence on L1 loss. However, attempts to determine ‘length of residence’ as a predictive variable in L1 loss have yielded mixed findings, showing that even after long-term stay in the L2 environment, the degree of language loss is notably low in relation to the limited L1 contact and extensive L2 exposure.

A seminal article by de Bot, Gommans and Rossing (1991) investigated what variables might influence the maintenance and loss of an L1 in an L2 setting. Their study focused on Dutch immigrants in France and sought to investigate the two predictor variables ‘amount of contact with the L1’ and ‘length of residence’. Participants were selected according to stipulated criteria: emigrated after the age of seventeen, lived in France for at least 10 years, and exhibited variation in L1 contact (De Bot et al. 1991:88). In order to test general proficiency in Dutch, the Foreign Service Interview tests were administered, followed by a grammaticality judgement task. The

results demonstrated that the length of residence may only have an effect when there is limited or no contact with the L1, and the length of residence may even have less relevance when a high degree of L1 contact is present (Chericev 2010). This seminal work demonstrated that the first five to 10 years without sufficient contact to the L1 are crucial in maintaining the L1 and avoiding language loss (Schmid 2011a). In a sense, during this crucial time the degree of language loss is established and thereafter, no additional time without L1 contact will substantially increase the level of language loss (Bylund 2009).

In a recent study, Schmid (2011b) sought to replicate de Bot, Gommans and Rossing 1991 study. More specifically, the purpose of Schmid's (2011b) study was to carry out a large-scale replication, looking at L1 German speakers in an L2 English setting and in a L2 Dutch setting, focusing on the interaction between two variables; length of residence and amount of contact with the L1. Schmid (2011b) predicted that both frequent and infrequent use of the L1 may accelerate the language loss process. The same set of data used in Schmid (2007) and Schmid and Dusseldorp (2010) was utilised. To measure the degree of L1 proficiency each participant was tested by means of a grammaticality judgement task, C-test, two Verbal Fluency tasks, a Charlie Chaplin Retelling task and a sociolinguistic questionnaire. The results and analysis of the interaction between contact and time showed that the only variable for which this interaction became significant was the Verbal Fluency task. Schmid's (2011b) finding corroborates De Bot et al.'s (1991) results to some degree. However, Schmid (2011b) explains that there are two types of changes or deteriorations in the L1. In the first type, speakers hardly use their L1 and therefore show accelerated signs of L1 loss, such as in free speech and formal tasks and the potential to develop a foreign accent. In the second type, speakers use their L1 daily and still show accelerated signs of L1 loss. The reason for this may be due to the variety of L1 use within a community (Schmid 2011b). The results of both Schmid (2011b) and De Bot et al. (1991) highlight that the interaction of the two predictor variables, amount of contact and 'length of residence', is neither linear nor straightforward, but, they are interrelated and no individual variable is able to explain language loss on its own (Chericev 2010).

The 'length of residence' factor has usually been applied to studies whose participants have resided in the L2 community/environment for at least a decade, as it is only during such a time that language loss effects are established (Schmid 2011a). However, a recent study by Ribbert and Kuiken (2010) challenged this assumption.

Ribbert and Kuiken (2010) completed a study which emphasized that changes in the L1 are subject to contact with another language. The study investigated the grammatical competence of L1 German speakers living in the Netherlands. The aim of the study was to determine the transfer effects from the L2 (Dutch) onto the L1 (German), with particular focus on cognates and the overgeneralization of the German complementiser *um* as a result of the influence from the Dutch *om* (Ribbert & Kuiken 2010:42). All experimental participants were (former) university students living in the Netherlands between seven months to eleven and a half years, and all participants were fluent in German. The data collected from the 52 participants was elicited by means of a specific type of grammaticality judgment task: participants were given two sets of lists of sentences and asked which ones were grammatically correct. The results showed that the experimental group was outperformed by both control groups (L1 German and L1 Dutch). Although Ribbert and Kuiken (2010) did not investigate 'length of residence' per se, the results did show that even after a short amount of time without L1 contact interference from the L2 was and language loss was documented. What this study demonstrated is that the time elapsed without language contact reduces the accessibility and exposure to the L1 within a short period, especially if the two languages are typologically and geographically close (i.e. German and Dutch).

While de Bot, Gommans and Rossing's (1991) and Schmid's (2011b) studies give more of a general overview of the use of 'length of residence' as a predictor variable in L1 loss, Ribbert and Kuiken (2010) focus on a very particular grammatical area of L1 loss and the results demonstrated that 'length of residence' is a factor in language loss. The contradicting results found in the studies, once again highlight that 'length of residence' and L1 contact are not only interlinked, but that long term residence in an L2 environment will have an effect on the L1 (de Bot et al.:1991; Schmid 2011b), while Ribbert and Kuiken (2010) demonstrated that even with easy and constant access to the L1, L1 loss can occur within a short period of time. Ribbert and Kuiken's (2010) findings are supported by Pavlenko and Jarvis (2002). These authors investigated oral narratives, produced by 22 participants, of Russian L2 users of English who had all acquired English post puberty and had lived in an L2 context between 3 to 8 years. Their results showed that L2 influence on the L1 manifested itself within 3 years.

From the above discussion it is understood that the time elapsed without language contact (i.e. length of residence) correlates strongly with the lack of L1 contact or rather with the infrequent use and exposure to the language (De Bot et al 1991; Schmid 2011b; Ribbert & Kuiken 2010). What this means is that the rate of language loss is contingent on the use and frequency of use

and input of the L1: the more speakers are able to maintain their L1 during the first few years after emigration, the more likely it is that their L1 will remain stable (Schmid 2011a:79).

2.4.3 Education

Education is a variable to consider in language loss research for several reasons; however there are two specific reasons that pertain to this paper. The first relates to literacy skills and development, and therefore applies more to child attriters and incomplete L1 learners. Köpke (2007:21) asserts that “less attrition is to be expected in subjects who have had the opportunity to become literate in the L1, especially if they frequently use that skill”. Literacy skills and development during childhood allows the child to stay in ‘contact’ with the language, by means of written and verbal input as well as greater exposure to the linguistic structures (Köpke 2004a). Obtaining input in the L1 by means of literacy skills, schooling and even a higher education, which promotes more access and variety in the L1, appears to be beneficial for the prevention or delay in L1 loss (Dostert 2009; Cherciov 2010). The second reason the education variable is relevant is linked to its influence on formal test performance. The assumption is that a higher level of education in the L1 is related to a larger lexis and grammatical structure and greater access and openness to writing and reading in the L1. These skills usually manifest themselves in tests such as the C-test: the less educated or familiar an individual is with the language and testing, the more likely it is that evidence of either attrition and/or incomplete L1 acquisition will emerge and therefore caution needs to be taken when this variable is investigated (Cherciov 2010).

Empirical studies that have investigated the impact of education on language loss find themselves with mixed results.

Schmid and Dusseldorp’s (2010) study investigated L1 attrition in German speakers in Canada and the Netherlands. The purpose of the study was to determine the impact of various external factors, as well as sociolinguistic factors, which may account for overall L1 proficiency and identify specific language use and attitude factors that have a protective effect against language loss (Schmid & Dusseldorp 2010). The experimental design included a sociolinguistic and personal background catalogue questionnaire, a C-test, two verbal fluency tasks, a grammaticality judgment task and a Charlie Chaplin film retelling task. In regards to education, the results revealed that the more highly educated speakers outperformed those who had a lower education for both the C-test and the free speech samples. As such, it seems reasonable to conclude that the higher the educational level the more beneficial for L1 maintenance, especially

in test performance. What is of note in this study is that the participants were considered mature L1 speakers whose L1 had completely developed and stabilized before the onset of bilingualism. The results should therefore be of no surprise as monolingual education provided the attriter with substantial linguistic knowledge.

On the other hand, in a study investigating the use of English loanwords in L1 isiXhosa-L2 English bilinguals, Bylund (2014) considered primary and high school schooling as predictor variable for bilinguals in a multilingual setting. Data were collected by means of a sociolinguistic and personal background questionnaire and Picture Naming task (PNT). The results showed that exposure to isiXhosa in primary and secondary school had a positive influence on performance on the PNT. This suggests that those individuals who had English as the main medium of instruction at school were more prone to using English loanwords in their L1 isiXhosa (Bylund 2014). This study underlines that schooling and medium of instruction are important factors which affect the L1 and its sustainability. Furthermore, the importance of exposure to the L1 in ‘schooling’ or ‘educational’ setting reiterates that via literacy skills in early childhood, it becomes a means of language contact and development (Köpke 2004a). Moreover, the use of and access to a L1 school provides the acquisition process with intense and massive L1 input of specific vocabularies across different genres and a variety of L1 sources. Also, this type of input provides a setting in which the quality of input is accurate and linguistically varied, rich as well as contextually appropriate with abundant aural and written input and output (Montrul 2008).

In regards to education, L1 speakers arriving in an L2 dominant setting before the onset of puberty will need to transition from an L1 medium of instruction to an L2 medium of instruction. Bylund and Diaz (2012) therefore investigated the influence of Heritage Language (HL) classes on L1 proficiency in an L2 setting and examined HL class attendance as a likely variable in incomplete L1 acquisition and attrition in high school students. Data were elicited by means of a grammaticality judgment task (GJT) and a cloze test from L1 Spanish – L2 Swedish grade 12 students in Swedish-speaking schools. Results from these tests showed that HL classes may halt or counterweigh language loss, though only on a short term basis. Once again this reaffirms that exposure and contact to the language is crucial in developing and strengthening the L1 during and before puberty (i.e. the critical period) in order to maintain L1 proficiency and competence (Bylund & Diaz 2012). Literacy skills development, during and throughout the critical period, are beneficial and necessary in resisting and counterweighing language loss and promoting L1 development, even in an L2 dominant setting (cf. 2.3.2).

The above empirical studies not only demonstrated three types of educational settings but also differential effects which may serve as a function of the setting. Schmid and Dusseldorp (2010) considered late bilinguals whose L1 had fixed before arrival in an L2 dominant setting. Bylund (2014) investigated bilinguals who were born into a multilingual setting, thus showing the complexity of L1 development in an L2 context. And lastly, Bylund and Diaz (2012) examined the benefits of L1 schooling in an L2 dominant setting in migrant high school children, thus raising a factor relevant for the present paper on where the education process was completed solely in an L1 context (i.e. only Germany), partly in an L1 setting or partly in an L2 setting (i.e. Germany and then South Africa) or solely in a bilingual setting (i.e. only South Africa). The significance of this is that it differentiates late bilinguals, for whom the L1 has completely developed and has remained stable for a number of years, and early bilinguals for whom the input in the L1 was interrupted and cut short before the L1 could fully develop or achieve full attainment.

2.4.4 Attitude

An important factor for L1 and L2 development is “the immigrants’ attitudes with respect to language competence and bilingualism, their origins, and their integration into the L2 community” (Köpke 2007:26). Individual components such as attitude, motivation, identity and emotion (generally subsumed under the generic label ‘attitudes’) are potential factors in language loss that need to be considered closely. Schmid (2011b:98) asserts that the use of ‘attitude’ as a predictor variable in L1 loss “is important in predicting an individual’s success for ultimate attainment in second or foreign language learning.” In fact, in a seminal and poignant study, illustrating the impact of attitudinal factors on language loss, Schmid (2002) examined L1 attrition in German Jews living in America. Schmid hypothesised that the more persecution a participant had to endure during the Nazi persecution, the more the L1 linguistic system diminished and acculturation to the L2 became a priority. Schmid’s (2002) results highlighted that those participants who emigrated towards the end of the 1930’s, when persecution worsened, had a negative attitude towards their L1 and the German culture, and as a result their L1 had significantly attrited.

A further aspect to consider when examining ‘attitude’ is the age of emigration, since according to (Schmid 2011a:98) the degree of language loss is determined by the speaker’s attitude at the moment of emigration. In other words, the attitude the speaker has upon emigration establishes

the motivation to maintain the L1 and to acquire the L2; hence Schmid's (2002) findings. The age factor raises another important difference between adults' and children's attitude. Adults differ from children in their attitude towards the L1 since the L1 has become an integral part of their (adults') identity and cannot be readily abandoned (Köpke 2007). For young children, on the other hand, a sense of identity and connectivity to the L1 has not been established and therefore they may lack the motivation (or understanding) to maintain the L1. Similarly, school children's and adolescents' attitude to the L1 is less significant as they are oriented towards the peer group and its language (Köpke 2007). As such, children are motivated to integrate into the L2 environment and as a result may not reach full L1 attainment and may be subject to incomplete L1 acquisition.

In order to shed some more light on the impact of attitude and motivation on language loss, Ben-Rafael and Schmid (2007:210) conducted a study that addressed "the issue of L1 attrition among two communities of migrants in Israel". The general aim of the study was to determine the role and establish the influence of an individual's attitude towards the L1 and L2 as an important predictor variable for language loss. For this reason, Ben-Rafael and Schmid (2007) selected a group which consisted of 15 L1 French speakers and 15 L1 Russian speakers. It was further highlighted that the reasons, i.e. motivation, for immigrating into Israel were quite different for each group. While the French group immigrated for ideological reasons, the Russian group immigrated for practical and pragmatic reasons. Data was collected by means of a semi-structured interview, focusing on issues such as motivation for immigration, difficulties adjusting to the new language and attitude towards their L1 (French/Russian) and the L2 (Hebrew). The data was transcribed orthographically and subsequently analysed in order to "identify instances of code-switching and characterise language attitude and motivations" (Ben-Rafael & Schmid 2007:212). The results revealed that the French participants had far more crosslinguistic interference from the L2 than the Russian participants. As such, the French participants' L1 and L2 was far more intertwined, indicating that this group's need to integrate into the language of the country was strongly influenced by their attitude, motivation and ideology.

In the end, the basic conclusion that may be drawn is that a positive attitude towards the L1 and a high motivation to maintain the L1 result in a greater retention and better maintenance of the L1 (Ben-Rafael & Schmid 2007; Köpke 2007). On the other hand, a negative attitude and low motivation may result in language loss (Schmid 2002). Lastly, attitude and motivation differ in

adults and children which in turn affects the degree of language loss and influences the L2 acquisition process.

2.5.5 Degree of language contact and use

As mentioned previously, it is commonly assumed that language loss is contingent on the contact and use of the L1; the more frequent a speaker uses the L1, the better the L1 will be maintained and remain active. However, the predictor variable of L1 contact is not straightforward. For one it is difficult to adequately measure such a phenomenon in quantifiable terms (Schmid & De Bot 2004). Schmid and de Bot (2004) make it explicitly clear that ‘contact’ depends on two factors: opportunity and choice. The former is, generally speaking, outside the individual’s control. L1 contact is often reduced to certain contexts or domains, such as family or other immigrants. However, for the latter of the two factors, the individual may choose not to have contact with other L1 speakers and rather integrate into the L2 environment. Furthermore, Schmid (2011a) suggests there are two different means of contact: passive and active. Simply put, passive contact entails receptive input such as through books, television, radio, etc.: the individual is exposed to the language but does not use it. Subsequently, active contact suggests that the individual is not only exposed to the language but produces output, for example interaction and contact with friends and family in the L1 country. The two fundamental factors regarding contact as outlined by Schmid and de Bot (2004), opportunity and choice, alongside the different means of contact, whether passive or active, suggested by Bylund (2009), are foundational for L1 development in a bilingual setting for attriters and incomplete L1 learners.

There have been studies which attempted to measure the influence and importance of contact on L1 loss. For one, the seminal study of de Bot, Gommans and Rossing (cf. section 2.4.2) revealed that contact only had an effect on language development in interaction with length of residence.

In another study investigating active and passive exposure to L1 of bilinguals in Canada and the Netherlands, Schmid (2007) assessed German proficiency by means of various tests. The purpose of the study was to investigate and assess to what extent frequency of use of the L1 in everyday life influences overall performance in the L1, and to what extent the amount of use of the L1 in daily life has predictive power on L1 development and maintenance (Schmid 2007). It was predicted that the disuse of the L1 in an L2 setting will reduce the accessibility of the L1 lexical repertoire (cf. the Activation Threshold Hypothesis, see Chapter 3). The participants were grouped into three categories: L1 speakers of German in Canada, L1 speakers of German in the

Netherlands and a control group of speakers in Germany. The experimental design consisted of a sociolinguistic and personal background catalogue questionnaire, a verbal fluency task and a Charlie Chaplin film retelling task. In order to assess for L1 loss, Schmid (2007) analysed the data by means of a one-way ANOVA of the following variables: age, education and length of residence. She further assessed the variables through the different bilingual modes of L1 use, according to Grosjean's (2001) model explained in section 2.2.1 of the current study. The results indicated that there is no "interaction between any of the lexical access, lexical diversity and fluency measures used and frequency of L1 use in daily life in any language mode" (Schmid 2007:149), except for those participants who use their L1 in a professional capacity who achieved slightly higher results. In other words, Schmid's (2007:150) finding would suggest that although there is evidence of language loss, the amount of use of the L1 in daily life "does not have a predictive power" over L1 loss due to a "kind of saturation point of rehearsal". As a result, Schmid (2007) proposes that there is a certain point of stabilisation, due to continuous rehearsal of L1 knowledge, at which language loss depends less on the quality of contact, and rather on the quantity of contact.

The relationship between the amount of L1 use (quantity) and L1 type of L1 use (quality) is also addressed in Schmid and Dusseldorp's (2010) study. The authors substantiate that a key factor that influences the amount and use of the L1, is "the extensive exposure to the L2 in their daily life" (Schmid & Dusseldorp 2010:152). The idea of the stabilization point or saturation point holds true for speakers who have successfully acquired the L1, while the same conclusion may not be accurate for incomplete L1 learners (Montrul 2004, 2008). However, it stands to reason that both attriters and incomplete L1 learners would benefit from quantitative contact for L1 development and maintenance.

The before mentioned study demonstrated that L1 loss is a language-contact induced process. In other words, the L1 linguistic system is affected by 'contact' with another linguistic system, an L2. An interesting study was conducted by Stolberg and Münch (2010) which spanned over 4 years collecting data from a single subject of L1 German residing in an L2 English environment. The aim of the study was to one, investigate whether language loss is permanent or temporary, and, two, analyse which linguistic skills are recoverable and which are permanently lost. The collected data consisted of recordings of free and informal conversations on a variety of topics (from childhood to politics). In the end, 12.5 hours of conversation were analysed. The results revealed a re-learning or re-training process in the subject's L1 linguistic abilities, such as the accessibility to lexical items. Stolberg and Münch (2010) concluded that the subjects'

accessibility (i.e. performance) to the L1 linguistic knowledge had been impaired by language loss, but the subjects' competence remained 'preserved', which altogether indicate that language loss is a contact-induced process. In other words, one of the reasons the L1 is susceptible to language loss is due to continuous contact with the L2 resulting in the individual speaking both the L1 and L2 interchangeably, in different settings and with different interlocutors. However, because Stolberg and Münch's (2010) subject did not have frequent and intense contact with the L1 and other L1 bilingual speakers, this suggests that the L1 remained dormant and 'preserved', and thus the subject was able to reverse the language loss process. Lastly, the idea of re-learning and re-acquiring the L1 may in fact only be possible if the linguistic ability and knowledge had previously been fully mastered (Köpke & Schmid 2004; Montrul 2004).

Whereas Stolberg and Münch (2010) concluded that the infrequent use of the L1 resulted in a preservation effect, De Leeuw, Schmid and Mennen (2010) investigated the hypothesis that a sign of accelerated L1 loss is the development of a foreign accent. The purpose of the study was to determine whether L1 German speakers living in an L2 environment (Canada and The Netherlands) are perceived to have a foreign accent in their native language. There were four predictor variables that were examined to determine a global foreign accent in the native language: 'Age of Arrival', 'Length of Residence', C+M (code-mixing with the L1 accepted) and C-M (code-mixing with the L1 not accepted). De Leeuw et al. (2010) made an extensive argument that the impact of the type of contact with the L1 lies in the distinction of the two variables on C+M and C-M. C+M consisted of contact with family, friends and church gatherings, while C-M consisted of L1 contact with work, visiting Germany and frequent correspondence. The results indicated that the C-M variable, contact in a professional capacity and where code-mixing is prohibited and inappropriate, aided in maintaining the stability of the phonetic and phonological aspects of the L1 German. These findings have a strong correlation to Schmid (2007), Schmid (2011b) as well as Schmid & Dusseldorp (2010) results, revealing the importance of the use of the L1 in a work place or professionally possesses the capacity to weaken the language loss process. Lastly, De Leeuw et al.'s (2010) data analysis reveals that quality and quantity of L1 contact, when it comes to predicting the effect of a foreign accent, is a more significant variable than 'Age of Arrival' and 'Length of Residence'. This is in stark contrast to Ribbert and Kuiken's (2010) findings that even with easy and ample access to the L1 (Germany-Netherlands proximity) language loss is not just a possibility but a definitive.

A more recent study by Schmid and Jarvis (2014), which focused on lexical accessibility, seeks to understand the phenomenon of how less exposure to the L1 and increase of exposure of the L2 may result in a reduced L1 accessibility. What is more, this study set out to demonstrate that language loss is largely an outcome of the “increased cognitive load involved in managing two linguistic systems at the same time” (Schmid & Jarvis 2014:5), rather than the common explanation of lexical inaccessibility due to the Activation Threshold Hypothesis. The general aim of the study was threefold: first, to investigate how the L1 and L2 influence lexical deterioration, second, to apply an in-depth analysis of methods typically used in language loss research and third, to analyse the collected data by means of a linear discriminant analysis (DA). The results revealed that while extralinguistic factors such as frequency of exposure and use of the L1, and ‘length of residence’ have no predictive power to lexical attrition, the only extralinguistic variable that had a significant impact on the formal tasks was the use of L1 in the workplace (Schmid & Jarvis 2014). Furthermore, through the DA, language use in the interview speech sample revealed to be a strong predictive indicator as to who would be more susceptible to language loss, and who would not. In other words, Schmid and Jarvis (2014) determined language usage (in this case using free speech) as a strong predictive task to language loss. Lastly, the authors concluded that their findings raise the question to what extent controlled tasks assess language loss or just a declining metalinguistic skill.

An empirical study by Montrul (2004) compared and examined the relationship between two groups: L2 acquisition group and incomplete L1 acquisition by 2nd and 3rd generation bilinguals. What is particularly of note of Montrul’s (2004) is the significant and potential effect of transfer from a dominant language (L1 or L2), as well as how the reduced input, decreased frequency and language use can contribute to erosion of the target language or stunt its development. By comparing post-puberty L2 learners and adult heritage speakers by means of spontaneous oral production, a morphology recognition task and two meaning judgment tasks, Montrul (2004:275) concluded that reduced input and frequency of use throughout the critical period “conspire to promote incomplete grammatical states in the heritage language of bilinguals who live immersed in the majority language”. Montrul’s conclusion demonstrates that language frequency (in terms of input) and use by either an L2 learner or heritage speaker are foundational in maintaining or developing the target language. This is of particular importance for the present paper as it may apply to both adult bilinguals seeking to maintain their proficiency or incomplete L1 learners developing their linguistic skills.

The existing evidence shows a complex relationship between contact and loss, such that certain types of contact and certain circumstances are more influential for L1 development and maintenance than others. Since contact plays a key role in language acquisition and language development, maintenance and loss, it is certainly going to be influential for the current study.

2.5 Summary

Investigating L1 development outside its naturalistic setting (i.e. the L1 setting) is becoming an important endeavour in language loss research since many individuals migrate away from their country of origin into a new L2 environment. In fact, the development and maintenance of the L1 deserves attention in language loss research as it ventures into different linguistic phenomena, such as attrition and incomplete acquisition. Generally, the first manifestation of language loss is the increased difficulty with lexical retrieval (i.e. performance difficulty) and the decline of language proficiency. This process will be contingent on the continuous shifting of a bilingual speaker on the language mode continuum (Schmid 2007; Grosjean 2001). In other words, while the L1 lexicon is susceptible to L2 influence and transfer, it is also easily restored (Stolberg & Münch 2010). Crosslinguistic influence is not only a process which incorporates elements of one language into another; it also refers to any effect one language has on another. In sum, crosslinguistic influence of the L2 on the L1 becomes inevitable for the bilingual individual (Pavlenko 2000).

The distinction between what constitutes an attriter and an incomplete L1 speaker (heritage speaker) clarifies that only those speakers who have fully acquired and mastered L1 linguistic skills, and this skill has remained stable for a certain amount of time, may be classified as attriters. Incomplete L1 learners, on the other hand, more often than not are classified as simultaneous or sequential bilingual speakers as it is the presence of another language that interrupts the L1 development as well as the absence of sufficient continued input in the L1.

There are several factors or variables that influence language maintenance, development or loss in L1 attriters and incomplete L1 learners. The age of reduced contact is important for two main reasons. First, it differentiates between child bilinguals and adult bilinguals. Often young speakers stop acquiring the L1 when placed in an L2 environment and as a result may become incomplete L1 learners, while adult speakers have already acquired their L1 before entering into the L2 environment. The second reason is that age of reduced contact relates to the susceptibility to language loss. Especially in regards to young speakers, if the L1 is not consolidated then it

may more easily be lost than for adult speakers. However, the age factor is not sufficient in preventing language loss. The time span spent in an L2 environment is a common predictor variable closely associated with the age factor. Considering length of residence as predictor variable is important in any L1 loss investigation. Studies have shown that language loss is exacerbated over time if low or no L1 contact is maintained (de Bot et al. 1991; Schmid 2007; Schmid 2011b). Other studies (Pavlenko & Jarvis 2002; Ribbert & Kuiken 2010) have shown that even after a short time in the L2 context, language loss is manifested if certain criteria are in place (e.g. language similarity).

Another predictor variable is education. In bilingual development literary skills play an important role. Not only does education offer access to the language and promote a relearning process (Bylund & Diaz 2012; Stolberg & Münch 2010) it also cements and entrenches linguistic skills. However, in order for these skills to remain stable these skills need to ideally be introduced during the critical period (Montrul 2004; 2008). As such, education is closely linked to the completion of formal tasks, such as C-tests and grammaticality judgment tasks. Consequently, those participants with a higher education level outperform those on a lower level. The educational factor needs to be monitored closely when used as a predictor value, and it is not always related to the language loss process as “more highly educated speakers will outperform those with less education in any population” (Schmid & Dusseldorp 2010:150) and not all participants received and had access to L1 education. Further, the use of the predictor variable ‘attitude/motivation’ influences those bilingual speakers the most who seek to assimilate and acculturate with the L2 culture and other L2 speakers (Ben-Rafael & Schmid 2007). In essence, attitude and motivation contribute to the speakers’ willingness to either maintain or develop the L1 within a L2 setting.

Lastly, frequent use and exposure to the L1 is not sufficient to retard the language loss process (De Bot et al. 1991; De Leeuw et al. 2010; Schmid 2007), but it may exert a significant effect on language loss if the types of contact (qualitative and quantitative) and context of such contact are conducive to L1 maintenance and development (Cherciov 2010; De Leeuw et al. 2010; Schmid 2007; Schmid & Dusseldorp 2010).

3. Theoretical Framework

3.1 Introduction

The present chapter provides a theoretical background to the phenomena of language loss relevant for this paper. The first section (3.2) will give an overview of different theoretical hypotheses found in language loss research. Afterwards the Activation Threshold Hypothesis (Paradis 2007) (3.3) will be examined at length, with reference to its function and relevance in language loss research. Lastly, a brief summary (3.4) of the important frameworks will be given, highlighting the theoretical backbone of the phenomena of attrition and incomplete acquisition.

3.2 Overview of linguistic models (theoretical hypotheses)

Numerous theoretical frameworks have been applied to recent studies within language loss research. Within the volume *Language Attrition: Theoretical perspectives*, Köpke, Schmid Keijzer and Dostert (2007) selected a number of studies which utilised different theoretical frameworks. Often these theories are intrinsically related to L2 acquisition theories (De Leeuw 2008). An example of this is the Interlanguage Hypothesis. Initially introduced by Selinker in 1972 this account highlights the different stages an L2 moves through towards becoming a more dominant language and the role the L1 plays in such a process. In terms of L1 loss, the hypothesis is turned on its head and now concerns the influence of the L2 on the L1. This means that in the absence of L1 input, the L2 will take over and gradually replace the L1 (Schmid & Köpke 2004). The notion of transference (the L2 interfering or infringing on the L1) becomes a key contributor to the interlanguage in a language loss situation (similarly in L2 acquisition, the L1 interferes or infringes in the L2 thus contributing to the interlanguage). The phenomenon described by the Interlanguage Hypothesis appears to be externally induced, hence caused by the acquisition of an L2 triggered through the relocation to an L2 environment. Ribbert and Kuiken (2010) investigated the grammatical competence of L1 speakers living in an L2 environment from an interlanguage perspective. The results revealed that L2-induced changes appear through the transfer of the L2 cognates. In other words, if the L1 and L2 are similar, transference is very likely to happen faster than if the L1 and L2 were different (De Leeuw 2008). However, the change of a person's native language may not always be attributed to externally-induced factors alone.

L1 changes in the bilingual individual may also be internally-induced, as for example demonstrated in the Regression Hypothesis. The Regression Hypothesis was the one earliest framework to play a role in language loss research. The hypothesis developed from the assumption that language loss in aphasia is the reverse of language acquisition. Only recently has this hypothesis been investigated more systematically within the domain of language attrition. Keijzer (2010) investigated the loss of morphology and syntax in Dutch immigrants in Anglophone Canada. The predictions were that attrition was the reverse of acquisition; '*last one in, first one out*'. The findings showed that language loss occurred most strongly in the morphological domain, but not in the syntax realm. Keijzer (2010) concluded that the Regression Hypothesis may not distinctively show that language loss is internally-induced, yet it highlights that there are some L1 changes which cannot be attributed to L2 acquisition (De Leeuw 2008). As such, Keijzer (2010) went a step further and used the Dynamic System Theory (DST) to explain the regression patterns. The DST focuses on the development of human cognition and language. As such, DST views attrition and acquisition as two sides of one coin: language is "dynamic and every language user passes through stages of growth and decline" throughout their life (Keijzer 2010:16). Moreover, DST suggests that as the language user passes through the different developmental stages he/she passes *attractor* states. According to Keijzer (2007), *attractor* states are stages in an individual's language development process, stages of growth or decline, and depending on the strength of attraction to the next stage the system will move to the next attractor stage. Ultimately, the different stages indicate that language is continually in flux, and since these 'states' occur in both acquisition and attrition, parallels are likely to be seen as both present two kinds of developmental process along a continuum (Keijzer 2007).

What is further of note of the DST is that it considers extralinguistic factors, such as motivation and language contact. In addition the DST attempts to relate "linguistic, sociolinguistic and psycholinguistic variables and linguistic phenomena, such as language maintenance" (Cherciov 2010:53). In order to further explain attrition, Keijzer (2010) used two theories simultaneously, the Regression Hypothesis and the DST, to account for the internally-induced changes and the externally-induced changes, as well as other variables (such as, attitude, aptitude and language contact, amongst other) included in the DST framework. With this approach, utilising two theories to explain each other and the attritional process, may be a step forward in language loss research

While there are changes in a speaker's L1 that are either internally-induced or externally-induced, the Universal Grammar (UG) framework suggests there are changes that may be the result of independent language rules. The UG approach is a generative-linguistic model which proposes that there are parameters "which are fixed in the language acquisition process, and the questions that have been asked in [research on] L2 acquisition [...] inform the approaches to L1 attrition" (Schmid & Köpke 2004:18). In other words, there are set principles and properties that inform all languages. The UG approach thus suggests that the L1 has a "privileged status in the human mind" (Köpke & Schmid 2007:1) and is immune to language attrition in its foundational architecture of the language faculty, such that once the L1 parameters have been set, they cannot change (De Leeuw 2008). The UG approach is not only being used in attrition research but also used in incomplete acquisition research (see Montrul 2004; 2008).

There are two further theoretical frameworks that are worth mentioning: the Ethnolinguistic Vitality Theory (EV) and the Social Network Theory. Both these accounts view language loss from a societal point of view, in the sense that they analyse the individual within a group context. The EV attempts to identify the factors responsible for the "strength of a group's identity feeling" (Schmid & Köpke 2004:13), since language is strongly linked to a group's (and individual's) identity. Therefore the EV predicts that strong ethnolinguistic vitality would prevent language loss. Hulsen (2000) examined language loss from an EV approach and did not find any conclusive correlation between the participants' linguistic performance (i.e., retention or loss) and their EV indices. Similarly, the Social Network Theory attempts to establish a specific link between language loss and "the relationships an individual has contracted with other L1 speakers" (Schmid & Köpke 2004:14). In simpler terms, the Social Network Theory examines the influence of 'contact' with the L1, in a group setting. While these theories take the vantage point of group influence and access on language loss, they further postulate the importance of *contact* with individuals of the same (L1) language community in an L2 environment to possibly prevent language loss.

The theoretical frameworks reviewed above attempt to account for the language loss process, whether internally or externally induced or even induced by other factors such as independent language principles and group dynamics. Moreover, as shown by Keijzer (2010) the advantage of using several frameworks serves as a strong explanatory power on the language loss process. However, the fact that one theory alone cannot account for the attested language loss phenomena also suggests that the field is still in need of a more powerful theoretical framework.

3.3 Activation Threshold Hypothesis

While the above theories were each informed by external, internal, language-ruled or group-induced changes, the following section discusses language loss from a psycholinguistic and neurolinguistic perspective, starting with the Activation Threshold Hypothesis (ATH). The ATH was developed by neurolinguist Michel Paradis and has become increasingly useful for language loss research. The ATH forms an important part of Paradis' (2004) Neurolinguistic Theory of Bilingualism (NTB). Further important factors of the NTB, which influence the ATH, is the distinction between implicit and explicit linguistic knowledge, as well as procedural and declarative memory, and inhibition. All these factors may contribute to language loss and yet on the flip-side may also explain why language loss occurs. In order to better understand these before mentioned factors one needs to examine them individually and then consider them as a whole.

The most important constituent of the NTB in language loss research is the ATH (Paradis 2004). The hypothesis is based on a level of activation, by neural impulses, between neurons. With each stimulation (i.e. activation) the threshold level decreases, while subsequently no stimulation or activation increases the threshold level. In other words, the hypothesis postulates that the more frequently a linguistic item (be it a grammatical structure or a lexeme) is activated the less energy or impulses are necessary for the next activation (Schmid 2011a). If, however, an item is not used frequently more energy or impulses are required to activate such an item. With this in mind, Köpcke (2007) concludes that the most crucial predictive factor for language loss, within this hypothesis, is language use. In other words, the items used more frequently in an L1 or an L2 will be more easily accessed than the less frequently used L1 or L2. Paradis (2007:125) clarifies that the ATH predicts that "(1) language disuse gradually leads to language loss; (2) the most frequently used elements of L2 will tend to replace their (less used) L1 counterparts; (3) comprehension will be retained longer than production because self-activation requires a lower threshold than comprehension." With the extensive reduction of L1 usage the speakers' performance and competence, in the L1, will gradually deteriorate and become inaccessible. What is more, the use of the L2 will raise the threshold of any L1 item that is no longer used frequently. As such, L1 loss first affects the mental lexicon followed by the morphosyntax, which is the simple result of "long-term lack of stimulation" of these linguistic items (Paradis 2007:125).

Any bilingual who predominantly speaks his/her L2 every day and has not used his/ her L1 in a long time will find that the L2 will frequently ‘*get in the way*’ when trying to retrieve an L1 item. What this means is that on the one hand the L1 is impeded by a lack of activation, while on the other hand the highly active L2 needs to be strongly inhibited (Köpke 2007:13). Schmid and Jarvis (2014) highlight that the activation threshold (AT) is not only determined by the activation of one item, but by the inhibition of its competitor. For example, if the speaker selects an item from the L1 its L2 cognate competitor or translation equivalent needs to be inhibited, i.e. repressed. This inhibition process also raises the activation threshold. Schmid and Jarvis (2014:2) therefore clarify that the language process, in this regard, is dependent on two processes. One, the underuse of the L1 raises the AT due to non-activation and two, the presence, use and development of the L2 raises the AT due to inhibition. What this means is that bilinguals routinely and involuntary need to inhibit the language that is not selected and this continuous phenomenon may well lead to difficulties accessing the mental lexicon of the language that is being inhibited (Schmid & Jarvis 2014).

The overall impact of the inhibition mechanism, according to Köpke (2007:13), is dependent on two crucial factors: (1) actual language use including the use of the L1 and the L2, the language mode (Grosjean 2001; Schmid 2007), codeswitching, and attitudinal factors; and (2) the typological relatedness of the L1 and L2. The latter factor highlights the closer the languages are in structure, cognates, etc. the more interference will occur (Köpke 2007; Schmid & Jarvis 2014). The activation and inhibition mechanisms appear to give better insight into the changing language patterns of bilinguals and how such languages are being controlled and processed. The ATH postulates that the language that is being frequently activated needs less stimulation to be reactivated than the language that is less frequently activated (Paradis 2004). Within this defined framework, Schmid and Köpke (2004:23) suggest that language loss “is thus predicted in the form of reduced accessibility as a natural consequence of lack of language use.”

While the activation and inhibition mechanism accounts for difficulties of accessing or retrieving words or other morphosyntactic structures, the NTB by Paradis (2004) makes a clear distinction between implicit and explicit linguistic competence and also highlights the distinction between procedural and declarative memory.

According to Paradis (2004) implicit linguistic competence refers to acquiring and using language on a subconscious level. In simpler terms, the speakers are unaware that they are

acquiring the rules and procedures of a language. Schmid (2011a:128) further explains this notion highlighting that “implicit knowledge is typical of the grammar of a language that had been acquired during childhood. [...] They are exposed to linguistic input – from their parents, caregivers or peers – while their conscious mind is focused on doing other things.” What is more, implicit knowledge is task specific which simply means the speaker is doing the task automatically, without being aware that he or she is doing it (Mehotcheva 2010). It is reasonable to assume, from the before mentioned explanation, that L1 acquisition leads to implicit knowledge and that all L1 grammatical knowledge that a speaker acquires is used automatically.

Explicit linguistic competence, on the other hand, refers to learning and using a language consciously and being fully aware of its rules and procedures. Unlike implicit knowledge, explicit knowledge is consciously learned and speakers analyse their learning process and language abilities at great length. Schmid (2011a:128) explains that while implicit knowledge is learned and used automatically, the use of explicit knowledge is controlled in production and understanding. The L2 learning process depends largely on repetitive and continuous learning and application of the new language being acquired.

Schmid (2011a:128) summarises that the distinction between implicit and explicit knowledge is “based on how the language was learned and affects how these aspects are represented in memory and used in production and understanding.” In fact, implicit and explicit knowledge and competence are completely separate from each other: they do not exchange information or data nor do they interact with each other (Mehotcheva 2010).

The reason for this ‘separation’ of knowledge might well be because of their place and function within memory. According to Paradis (2004) implicit knowledge is governed by procedural memory and explicit knowledge is governed by declarative memory. The former refers to the type of memory that is used without consciously thinking about it and relates to innate patterns and rules which lead to performing a task automatically (Mehotcheva 2010). Procedural memory is therefore involved in the learning of motor skills such as riding a bike or how to play an instrument, and is linguistically speaking involved in the acquisition of morphology or syntax (Köpke 2007). The latter refers to the type of memory that is used consciously whether this is the learning of another language or learning about events and facts, such as history or biology. According to Köpke (2007) and Mehotcheva (2010) the lexicon for all languages and the meaning of words, is stored within the structures of declarative memory. What this means for

language loss research is that the lexis is most vulnerable to interference and forgetting. Köpke (2007:18) clarifies this by observing that the lexis of an L1 and that of the subsequently learned L2 are expected to be located in the same memory structures (declarative memory). The grammars of the L1 and the acquired L2 are on the other hand more likely to depend on a different memory system. For the L1 it is the procedural memory while for the L2 it is the declarative memory. With this in mind and with respect to L1 loss, the lexis or vocabulary of an L1 speaker, whether the speaker is an early or late bilingual, is not exempt from interference from another language, whereas the grammar of an L1 speaker, by contrast, is more resilient to language loss.

These predictions or assumptions, that the L1 lexis is the most vulnerable linguistic feature to language loss, within the ATH framework, have thus far been corroborated by several studies. On the basis of ATH, Schmid (2007) predicted reduced accessibility to lexical knowledge in potential attriters. Although her findings indicated language loss, they also suggested “the possibility that frequency and recency of activation play a less prominent role” (Schmid 2007:150) in L1 loss than they do in other bilingual (or multilingual) contexts. Schmid suggests a possible saturation point for the stabilisation of knowledge, in which abstract L1 knowledge has been rehearsed extensively within a monolingual setting. Once this point has been reached (i.e. stabilisation point) frequent activation is no longer necessary for accessibility, and inhibition becomes the process which impacts the AT. At this point, it could be suggested that the L1 lexis, associated with declarative memory, in fact becomes more resilient to language loss due to a point of saturation in rehearsal of use. For further discussion on the role of L1 contact, see Schmid and Dusseldorp (2010) in Chapter 2 of this thesis.

A more recent study by Schmid and Jarvis (2014), which started from the assumption that loss within the L1 lexis is related to the frequency and recency of L1 use as ascribed by the ATH, corroborated the findings from Schmid (2007), Schmid and Dusseldorp (2010), as well as from De Leeuw, Schmid and Mennen (2010). Schmid and Jarvis (2014) observed that there is only one language use factor which has become apparent as a significant predictor of language loss across a range of skills and linguistic levels. This predictive factor is the use of L1 for professional purposes and can be explained in terms of inhibition. What this means is that code-switching and code-mixing are prohibited in a work environment and therefore the speaker is constantly practising to inhibit the L2 and any interference that would come into play in a formal setting (Schmid & Jarvis 2014). While this might hold true for monolingual and even bilingual settings, it should be pointed out that no studies have corroborated this assumption for

multilingual settings. In these settings, it may be the case that when multilingual speakers interact and converse professionally, switching between languages is permitted and constitutes common linguistic practice. We will return to this point in the discussion.

Other studies by Schmid (2011b) and Stolberg and Münch (2010) have also examined their findings through the ATH. Stolberg and Münch's (2010) study interestingly revealed that L1 linguistic knowledge did not disappear but rather became 'deactivated', and simply needed re-activation for accessibility. In contrast, Schmid's (2011b:169) study concluded that the disuse of the L1 linguistic system may lead to "some degree of 'atrophy'". While this holds true for speakers who have fully acquired their L1 and experience attrition due to a lack of use, such as the participant in Stolberg and Münch's (2010) study.

3.3.1 Activation Threshold Hypothesis and incomplete acquisition

For the most part, the Activation Threshold Hypothesis has been applied specifically to groups of attriting immigrants (Schmid 2007; Schmid 2011b; Schmid & Dusseldorp 2010; Stolberg & Münch 2010, to name a few). Within these studies, the Activation Threshold Hypothesis serves to better comprehend the activation of an item. When such an item has been inactive or unselected due to a lack of use, the activation threshold rises. Naturally, the more an item is activated and selected the more the activation threshold lowers, thus making linguistic items easier to access and retrieve.

In regards to incomplete acquisition, access and retrieval of a particular linguistic skill(s) becomes difficult if such a skill or knowledge of the use of the skill has not been mastered. Mehotcheva (2010) explains that this is due to a lack of entrenchment and submersion of the language as young children. In other words, in order for something to be activated or retrieved it needs to first have been acquired. For incomplete L1 learners it is important to account for the differentiation between performance (production) and comprehension levels. The production of a linguistic item will be more difficult to achieve than the comprehension of the same item, since production involves a higher threshold of activation than comprehension (Köpke 2004a; Montrul 2008). What this means is that a typical feature of an incomplete L1 learner is precisely an imbalance in comprehension and production skills. As such the former (comprehension) is often better than the latter (production). For incomplete L1 learners the inability to produce an item may therefore not be due to language loss but rather to incomplete acquisition (Montrul 2008).

With this in mind, the ATH may also apply to the acquisition of a feature: unless one is sufficiently exposed to that feature, mastery will not be complete.

According to Köpke (2004a), this developmental phenomenon is largely found in children since the linguistic system has not yet matured and influence from multiple languages may inform the competence level. Subsequently, the continuous disuse of the L1 will facilitate attrition because of the interference and competition of the L2. What is more, the lack of entrenchment and submersion in the L1 may result in a high activation threshold for particular L1 items, especially those that have a general low frequency in speech (in fact, such items may not be acquired at all). Therefore, typical performance problems for bilinguals are retrieval difficulties in the domain of the lexicon since lexical knowledge depends greatly on the frequency of use (i.e. activation) and the *fully* acquired knowledge of producing and comprehending an item.

3.4 Summary

After reviewing and discussing the different theoretical frameworks and applying them to them language attrition and incomplete acquisition a few conclusions may be drawn.

The first section gave an overview of the different types of theoretical frameworks, or linguistic models, which are currently being used in language loss research. Although each theory approaches language loss from a different perspective or starting point, the objective is the same: account for and predict factors leading to language loss. There are theories which consider external intralinguistic factors explaining language loss, for example the Interlanguage Hypothesis, and there are theories which consider internal intralinguistic factors explaining language loss such, as the Regression Hypothesis. Furthermore, the DST hypothesis considers extralinguistic factors and includes them into its framework and the UG approach insists changes are the result of an independent language which has its own principles and properties, which is found in all languages. Lastly, the EV and the Social Network theory emphasize the societal importance, specifically of L1 contact and input, within language loss theories.

The following section discussed the Activation Threshold Hypothesis in more detail, specifically the mechanisms that are reflected in the cognitive processes, such as activation and inhibition. The last section discussed incomplete acquisition within the ATH framework and highlighted some key differences between attrition and incomplete acquisition, and the approaches of classifying cases of language loss as attrition or incomplete acquisition. The present study will

not set out to test any specific theory; however the activation threshold hypothesis will help to interpret the results of the bilingual group of the current study.

4. Research Design & Methodology

4.1 Introduction

As was highlighted in Chapter 2, there has been ample research on L1 development in bilinguals living in an L2 environment. As such, Schmid and Dusseldorp (2010) have sought to establish a standardised test battery for language loss studies in order to validate the research design and its methods and obtain comparable data across studies. This chapter documents the design of the present study and the methods used to elicit the data as proposed by Schmid and Dusseldorp (2010). The first section (4.2) will give an overview of the study guided by the research question and hypothesis. This is followed by presenting the participants (4.3). The following section (4.4) will discuss the data collection instruments, including a sociolinguistic and personal background questionnaire, a picture naming task, a verbal fluency task and a C-test, as well as the procedure of elicitation. The last section (4.5) will summarise the above mentioned points.

4.2 Design of study

The aim of the current study is to investigate which background variables influence L1 lexical development in a L2 context in bilingual speakers with German as L1 and English and/or Afrikaans as L2. The study focuses particularly on the role of L1 contact for this behaviour.

Three different tasks were used to collect the data:

1) a sociolinguistic personal background questionnaire was administered, consisting of personal information, linguistic background, and linguistic experience questions, 2) a picture naming task and 3) verbal fluency task both of which were used to establish L1 lexical knowledge L1, and 4) a C-test was implemented to gain insights into general L1 proficiency (see section 4.4 for further details). These four instruments or tools have been used in previous research (e.g., Bylund 2014; Cherciov 2010; Mehotcheva 2010; Schmid 2007; Schmid & Dusseldorp 2010) which seeks to characterise L1 competence and development in an L2 context.

The results obtained by the sociolinguistic and personal background questionnaire will represent the predictor (independent) variables, such as personal background variables (age, age of arrival, length of residence, education level) language contact, language identification and language

attitude. The results from the picture naming task and the verbal fluency task will represent the dependent variables.

4.3 Participants

Data was collected from a total of 22 bilingual speakers residing in the greater Cape Town metropolitan area with German as their L1. Participants were initially recruited and contacted through personal contact of the researcher, as well as through social media (for example, Facebook) and advertisement in German-affiliated institutions, such as churches and schools. The majority of participants were recruited through further contacts suggested by participants themselves and therefore initiated a ‘snow-ball’ effect. Interested participants contacted the researcher via email or telephone and a meeting was arranged. For convenience to the participant, the researcher met the participant either at home, at work or at other venues suggested by the participant, as long as these provided a silent and non-distractive testing environment. The data collection continued for two months (March and April), due to limited time. During these months the recruitment process encountered some difficulties as several potential participants were reluctant to participate in the study. However, after a more in depth explanation of the scope of the study, some previously reluctant participants changed their attitudes. After the tests were administered, the participant usually became interested in the study and, more often than not, a discussion ensued with the researcher about the German language in South Africa.

The average age of the participant, as shown in the table below (Table 4.1), was 36 years of age: the youngest participant was 23 years of age while the oldest was 52 years of age. The professions of the participants ranged from University professor, to student, to translator, to business owner and even to a pastor. The majority of participants considered themselves bilinguals, at times even multilinguals, especially within a work environment. Often multiple languages were used within the profession of the participants, such as English, Afrikaans, German and other languages. The participants’ average age at emigration (from Germany) was around 12 years (see Table 4.1), ranging from 1 to 43 years of age. This therefore affects the length of residence of the participants. Where some participants had lived in South Africa for more than two decades, others had not yet been here for a decade. As such, the average length of residence was 23 years.

Table 4.1 *Participants’ age, age at emigration, and length of residence*

	TOTAL	
	average	stdev
Age	36	9.694
Age at emigration	12.818	15.435
Length of residence	23.363	14.11

4.4 Data Collection Instruments and Procedure

A sociolinguistic and personal background questionnaire and three types of formal proficiency tests (picture naming task, verbal fluency task and C-test) were used. All the tasks were presented and conducted in German. The sociolinguistic questionnaire and the C-test were completed in writing and the verbal fluency task and the picture naming task were performed orally and simultaneously digitally recorded.

All participants were individually interviewed by the researcher, usually at the participant's home. Furthermore, all interaction and communication between the researcher and participant was done in German.

The following sections will describe each test used and its procedure, following the methodologies used in previous studies (Bylund 2014; Ribbert & Kuiken 2010; Schmid 2007; Schmid & Dusseldorp 2010).

4.4.1 Sociolinguistic Questionnaire

Information on personal background (age, education, etc.), language use, and language attitude was elicited through a written sociolinguistic and personal background questionnaire consisting of 71 questions. The questionnaire was an adapted amalgamation of existing versions developed by Schmid and Dusseldorp (2010) and Bylund (2014). The questionnaire consisted of questions with binary yes/no variables (such as gender); a number of ordinal levels (for example education level); and a set of interval variables such as age at arrival and length of residence; and a number

of 3-point and 5-point rating scales, such as L1 use at work and in daily life, language proficiency, and language identification.

The scores on the 3-point scale were coded as follows:

- 1=German;
- 2=German/other languages
- 3= other languages

The scores on the 5-point scale were coded as follows:

- 1=only German;
- 2=mainly German;
- 3=German & other language(s) to same degree;
- 4= mainly other language(s);
- 5=only other language(s)

The present questionnaire was categorised into eight sections; each section relating to a specific variable.

1. Background information: This refers to personal background information of the individual; primarily to determine age, age of arrival and length of residence.
2. Interactive L1 contact: This relates to the use of L1 among friends and family of the individual.
3. Linguistic identification: This variable refers to the importance the individual attaches to the use of the L1 and the extent to which the individual associates (identifies) with the L1.
4. Non-interactive L1 contact: This variable is concerned with the 'passive' degree of L1 contact the individual has with the media, internet, books, television (i.e. Deukom), radio, etc.
5. Education: This relates to the media of instruction in the individual's education.
6. Attitude: This variable refers to the general attitude of the individual towards his/her languages.

The questionnaire was presented to the participant at the beginning of the meeting. Instructions were given by the researcher and were indicated on the cover page of the questionnaire.

Afterwards participants began answering the questionnaire and completed it within 20 minutes. The responses from each participant were later collapsed according to their variable/section (i.e. Interactive L1 contact, education, etc.) and an average was calculated to achieve a variable index, which was subsequently entered into the correlational analyses.

4.4.2 Picture Naming Task

The aim of the picture naming task is to investigate lexical access and accuracy in L1 attrition. According to Schmid and Köpke (2009) picture naming tasks are a valid measure for exploring lexical proficiency and lexical retrieval difficulties faced by speakers experiencing language loss. The picture naming task consisted of 80 black-and-white drawn images, in addition to 6 practice images. The images originated from various sources, such as the Philadelphia Naming Task (1996) and Snodgrass and Vanderwart (1980). The pictures used represented different objects, such as animals, household items, clothing, stationery, vehicles, parts of the body, etc., and were classified into high frequency items such as ‘tree’ (*Baum*), ‘grapes’ (*Weintrauben*) and ‘pig’ (*Schwein*) which facilitated easy lexical retrieval and accuracy, followed by low frequency items such as ‘acorn’ (*Eichel*), ‘domino tiles’ (*Diminosteine*) and ‘paperclip’ (*Büroklammer*). In addition, ‘*faux amis*’ such as ‘fan’ (*Ventilator*) were inserted into the naming task.

The picture naming task was created and presented in a PowerPoint presentation. It was programmed that each image would appear on the computer screen for 4000ms, thus giving the participant 4000ms to name the image. The period between two images was marked by an asterisk (*), indicating a pause that would last for 2000ms. The asterisk also served as a visual fixation point for the participant as to not be distracted by other things. Every experimental session with the participant was recorded with a digital voice recorder placed between the participant and the computer. Before starting with the task the participants were asked to sit in front of a desk and the computer/laptop was placed before them. The PowerPoint presentation began with clear instructions for the participant. In order to familiarise the participants with the task, a short trial version was run consisting of six images. After the trial session, participants were able to ask any questions concerning the task and once they were comfortable they began the actual task by pressing the space bar.

The duration of the actual picture naming task was on average 8:04 minutes and the recording device was stopped once the task was done. All responses were later coded by the researcher and scored according to a binary code:

1 = correct response/alternative (i.e. dialect)

0 = incorrect/unknown (no response)

All images and responses were scored against a *Hochdeutsch/Standarddeutsch* (Standard German) standardisation. However, different dialect versions were permitted and coded as 1. Any English or Afrikaans responses were marked as incorrect and coded as 0. Also, any response given after the image had appeared on screen was marked as incorrect and subsequently coded as 0. All codes were entered into an excel spread sheet to obtain data on both participant and item level, as is typically done with picture naming tests. The Cronbach α coefficient was calculated, resulting in a 0.94 reliability mark, which indicates excellent internal response consistency across participants and items.

4.4.3 Verbal Fluency Task

The verbal fluency task is a common tool to measure the rate of lexical retrieval within language loss research. Participants are invited to produce as many words as possible from a given category such as animals, fruits and vegetables, etc. within 60 seconds. These two categories are fairly culturally neutral and thus allow participants to produce a relatively large number of lexical items (Cherciov 2010).

The participants were first given clear instructions for the task. Afterwards the researcher presented the first category which was fruits and vegetables. Participants would then list items pertaining to that category. Items such as ‘apple’ (*Apfel*), ‘pear’ (*Birne*), ‘banana’ (*Banane*) and ‘grapes’ (*Weintrauben*) were amongst the first fruits mentioned, and usually in that order too. While in the vegetable category, items such as ‘tomato’ (*Tomate*), ‘cucumber’ (*Gurke*) and ‘salad’ (*Salat*) were the first three items mentioned. Interestingly enough, after approximately 20 seconds participants started to noticeably search for items in the given category and had difficulty producing an item. Since it is the purpose of a verbal fluency task to establish lexical access in the L1, all items were considered correct if named in German. Any items belonging either to English or Afrikaans, repetitions or different versions of the same item, such as *Karotte* and *Möhre* (two versions of the word ‘carrot’), were omitted from the final count. A digital

recording device was used for the task and all items were subsequently transcribed into an excel spread sheet.

Overall, the administration of the verbal fluency task is easy and does not require any extensive preparations or materials, and the task is indeed able to identify differences in speed and number of semantic retrieval items (Cherciov 2010; Dostert 2007; Schmid 2007).

4.4.4 C-test

The C-test consists of four to five separate texts, each text averaging 20 gaps. The test is constructed in such a way that the first sentence is left intact while half of every second word is omitted in the second sentence. According to Schmid (2011a) the test requires and measures low level skills such as the command of grammar, idioms and vocabulary. It also measures high-level skills such as global reading, etc. Overall the C-test has been used in numerous studies on L1 loss which have found it to be a valid and reliable predictor of general language proficiency, strongly correlating with the participant's educational level (Cherciov 2010; Keijzer 2007; Schmid 2007; Schmid 2011b; Schmid and Dusseldorp 2010).

The administration and scoring of the C-test is fairly simple. In the present research, participants were given four texts, resulting in a total of 80 gaps, and the task was to complete as many gaps as possible within 10 minutes. Participants were allowed to complete the test as they wished; revisiting previous texts or moving from text to text interchangeably. A subsequent reliability check using a Cronbach's Alpha was conducted resulting in a reliability level of 0.95, suggesting high reliability. All four texts have been used in previous language attrition investigations, which have been made available online by Schmid (2007) (www.let.rug.nl/languageattrition/experiments).

Table 4.2 *Participant's scores on the C-test*

Total no. Participants	Min	Max	Mean	Std. Dev
22	27.5	95	79.31	17.29

The above summary statistics of the C-test results show that the overall proficiency level of the group ranged from a low score of 27.5% to a high score of 95% and the mean=79.31% (SD=17.29). The group's C-test performance is similar to that of Schmid and Dusseldorp's

(2010) C-test results on L1 German language loss. Schmid and Dusseldorp (2010:138) investigated two bilingual groups with German as their L1 — one in a Dutch context and one in a Canadian English setting, with a (German or Germany) reference group. As it turns out the Dutch group's results ($M=77.2$; $SD=13.9$) are similar to that of the current participants' results (see Table 4.2). Furthermore, the Canadian group's results ($M=75.3$; $SD=11.6$) are also comparatively similar to the current results, as seen in Table 4.2. On a general level, the proficiency levels of the current participants are notably similar to that of other studies, such as Schmid and Dusseldorp (2010). For the present research, the results from the C-test serve to give an indication of the German proficiency level of the current participants compared to previous research on German in situations of language loss. The results will therefore not be discussed in further detail, but occasionally referenced.

4.5 Summary

The test and elicitation material and the administration procedure were all adapted from Schmid and Dusseldorp's (2010) study. The sociolinguistic and background questionnaire was an amalgamation of Schmid and Dusseldorp (2010) and Bylund (2014). The picture naming task was constructed using various images and the verbal fluency task simply utilised one category: fruits and vegetables. The C-test was taken from Schmid (2007). All tests were administered in one session which lasted approximately 45 minutes. The results were then transferred into an excel spread sheet and into the SPSS (Statistical Package for the Social Science) for inferential statistical analyses. The following chapter will present the results of the sociolinguistic and personal background questionnaire and the lexical proficiency tasks.

5. Results

5.1. Introduction

This chapter will report on the results from the sociolinguistic and personal background questionnaire as well as the picture naming task and the verbal fluency task. First, an overview of the performances on the picture naming task (5.2) and verbal fluency task (5.3) will be given. Afterwards, an outline (5.4) of the indices from the background questionnaire will be presented. The following sections, 5.5 and 5.6, will proceed to analyse which of the background variables may predict performance on the picture naming task and verbal fluency task, respectively. Thereafter, qualitative examples of individuals will be presented in section 5.7. A summary (5.8) of the above mentioned results concludes this chapter and introduces the following chapter.

5.2. Picture naming task performance

The maximum score on the picture naming task (PNT) was 80 points, which is expressed as 100%. With a Standard Deviation (SD — indicates how well the mean represents the sample) of 12.9, the participants' mean score was 82.1%. This means that, on average, just over 80% of the time the participants were able to correctly name the picture in German, and the rest of the time they either did not know the word or it was incorrectly named, such as using the English or Afrikaans word. The highest scoring participant achieved 96% accuracy, followed by three participants, all of whom achieved 94%. The lowest scoring participant obtained 43% accuracy. A closer look at the individual items revealed that different items presented different levels of naming difficulty. More specifically, naming difficulty progressively increased with each item. The first few items, including 'tree' (*Baum*), 'king' (*König*) and 'dentist' (*Zahnarzt*), 'elephant' (*Elefant*), 'glass' (*Glass*), 'igloo' (*Iglu*), 'cactus' (*Kaktus*) and 'pyramid' (*Pyramide*) were named 100% correctly by all the participants. Moreover, after the first few items errors, incorrect and non-responsive answers became frequent. Items such as 'turkey' (*Truthan*) received a 68% naming accuracy. 'Beetle' (*Käfer*), in contrast, achieved 80% accuracy. 'Dice' (*Würfel*) averaged on a high of 90%. 'Acorn' (*Eichel*) averaged on 70% accuracy. 'Crib' (*Wiege*), on the other hand, only achieved 40% accuracy. Evidently, some items were difficult to name for some participants while for others there was no difficulty. As the difficulty level increased so did the number of errors, specifically towards the end of the task. None of these items were cognates or

faux amis such as ‘muzzle’ (*Maulkorp*) with an average accuracy of 50%, ‘noose’ (*Schlinge*) with 31% average, ‘protractor’ (*Winkelmesser*) averaging on 18%, ‘yoke’ (*Joch*) with a 4% average and ‘tendrils’ (*Ranke*) with 4% accuracy. Between four to seven participants were able to name each of these items correctly. The majority of the participants did not respond to these items which in turn lowered their final percentage and confirmed lexical access difficulties or incomplete mastering of the item. Table 5.1 categorises the participants into accuracy response columns, showing that the majority of the participants fell into the third column with the group average being 82%. (See Appendix E for picture naming task items and their response rates.)

Table 5.1 Distribution of PNT scores

Picture Naming Task scores (max 100)
(number of participants per category)

100-95	94-90	89-80	79-70	69-60	59-40
(2)	(5)	(8)	(3)	(2)	(1)
P#	P#	P#	P#	P#	P#
2,17	4,6,15,20,22	1,3,8,9,12,14,16,21	5,11,18	10,19	7

Note: P=Participant

5.3 Verbal fluency task performance

The main objective of the verbal fluency task (VFT) was to assess lexical access and vocabulary size. The common categories are ‘fruits and vegetables’ and ‘animals’, only the former category was used in this thesis, and the two scores from each category is then summed up into one variable. A high score reflects a high ability to access vocabulary items and suggests a high proficiency level. On average, the participants were able to name 20.9 items (SD 5.9) in 60 seconds, with most of them clustering around 15 and 26 items (as indicated by the standard deviation). As seen in Table 5.2, the VFT scores were categorised according to the number of items produced within a given time. Clearly, the majority of the participants fell into the second column with only select individuals achieving a very high score and select individuals achieving a particularly low score and with the group average being 21 items within the given timeframe.

The highest score was 33 items while the lowest score was 8 items. Typically, in the first few seconds, participants were fluent in naming items of the given category and halfway through the task disfluency and word-finding difficulties emerged.

Table 5.2 Distribution of VFT scores

Verbal Fluency Task scores (number of participants per category)			
40-30	29-20	19-10	9-0
(1)	(12)	(8)	(1)
P#	P#	P#	P#
8	2,3,4,9,12,13,14,15,17,20,21,22	1,5,6,10,11,16,18,19	7

Note: P=Participant

The most common items that were retrieved within the fruit category were ‘apple’ (*Apfel*), ‘pear’ (*Birne*), ‘banana’ (*Banane*), ‘grape’ (*Weinrauben*), ‘mango’ (*Mango*) and ‘strawberry’ (*Erdbeere*). The less commonly mentioned items included ‘cherry’ (*Kirsche*), ‘pineapple’ (*Ananas*), ‘plum’ (*Pflaume*) and ‘orange’ (*Apfelsine*), amongst others. Within the vegetable category the most commonly mentioned items were ‘tomato’ (*Tomate*), ‘cucumber’ (*Gurke*), ‘potato’ (*Kartoffel*), ‘broccoli’ (*Brokkoli*), ‘onion’ (*Zwiebel*) and ‘salad’ (*Salat*). On the other hand, the less commonly used items included ‘asparagus’ (*Spargel*), ‘cauliflower’ (*Blumenkohl*), ‘peppers’ (*Paprika*), ‘cabbage’ (*Kohl*), ‘carrot’ (*Karotte*) and ‘mushroom’ (*Pilz*).

5.4 Overview of the indices from the background questionnaire

The background questionnaire responses were analysed according to the indices (participant responses) of each measured variable. The variables which are of importance for this investigation are: interactive L1 contact, linguistic identification, non-interactive L1 contact, education and attitude, as well as background information such as age of arrival and length of residence.

On the variable concerning the use of German and English/Afrikaans interaction with family, friends, etc. (‘Interactive L1 contact’), the participants overall used slightly more English and/or Afrikaans than German: average = 2.91, SD = 0.50 (1 = only German; 5 = only other languages). As for the variable ‘Non-interactive L1 contact’ (i.e. concerned with the ‘passive’ degree of L1 contact such as media, internet, books, television (i.e. Deukom), radio, etc.), the participants on average indicated that their contact to German was relatively low, averaging on 1.98 (SD = 0.82) (1 = never; 5 = very often). This is despite the fact that there are ample opportunities to access online newspapers, magazines and radio stations via the internet, as well as to purchase German

magazines (such as *Stern*, *Der Spiegel* and *Echo*) and books at a local Capetonian German book store (for example at the *Neumann Deutsche Buchhandlung*).

The following variable, ‘Linguistic identification’ (i.e. the importance the individual attaches to the use of and associates (identifies) with German) the participants averaged at 3.08 (SD = 0.34) (1 = only German; 5 = only other languages). Here, the response values were similar to the previous variable (i.e., Interactive L1 contact). A further variable was ‘Attitude’ (Att) (i.e. the general attitude of the individual towards German and other languages), which averaged on 2.71 (SD = 0.70) (1 = only German; 5 = only other languages). On a general level, these indices are neither distinctly favourable towards German nor towards another language, but rather in-between the two spectrums.

As for the variable of ‘Education’ (i.e. this relates to the media of instruction that were present in the individual’s education), access to and completion of German schooling had an average of 1.99 (SD = 0.59) (1 = only German; 5 = only other languages), suggesting that German had been slightly more present in their education than other languages.

As for the variable ‘Age of Arrival’ (AoA), results showed that the participants on average arrived in Cape Town at 12.8 years of age (SD = 15.4). The participant who arrived mostly recent was 43 years of age, while the participant to arrive the earliest was only 1 year old. The last variable, ‘Length of Residence’ (LoR), indicated that the participants on average have been residing in Cape Town for 23.3 years (SD = 14.1). The longest length of residence is 51 years (which is the participant who arrived at 1 year of age) and the shortest length of residence is 4 years.

Next, we proceeded to examine how or whether these different indices were related to each other. The relationship between them is presented in a Pearson correlation matrix in Table 5.3.

Table 5.3 Pearson correlation matrix of linguistic background variables

	Linguistic identification	Non-interactive L1 contact	Education	Attitudes	AOA	LOR
Interactive L1 contact	0.480*	-0.370	0.385	0.692**	0.382	0.235
Linguistic identification		-0.092	0.465*	0.552**	-0.528*	0.432*
Non-interactive L1 contact			-0.481*	-0.487*	0.485*	-0.295
Education				0.812**	-0.758**	0.671**
Attitudes					-0.651**	0.500*
AOA						-0.786**

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

As seen in the above table, many of the measured variables were inter-correlated. For example, the frequency with which the participants used German and other languages such as English and Afrikaans with family and friends ('Interactive L1 contact') was moderate to moderately strong¹ correlated with 'Linguistic identification' and 'Attitude'. This suggests that those participants who had more German contact were also the ones who had more positive attitudes towards this language and attached greater emotional importance to it.

Furthermore, 'Linguistic identification' was moderately correlated to most other variables, such as 'Education', 'Attitudes', 'Age of Arrival' and 'Length of Residence', thus exhibiting that those who identified more strongly with German were also the ones who held a positive attitude towards the language. Moreover, the participants who had had access to German schooling and had been instructed in German at school identified with German most significantly. As such, 'Linguistic Identification' goes hand in hand with 'Education' (German schooling), 'Age of Arrival' and 'Length of Residence'.

The 'Non-interactive L1 contact' variable correlated moderately to 'Education', 'Attitudes' and 'Age of Arrival', showing that the amount of contact with German in different media goes hand in hand with the school language ('Education'), the 'Attitude' towards the German language and the 'Age of Arrival' in the L2 setting.

The following variable, 'Education', exhibited moderately strong to strong correlations with all the other independent variables. 'Education' strongly correlated with 'Age of Arrival', 'Length of Residence' and especially with 'Attitudes'. This suggests that being schooled in German or having a German-schooled background results in a more favourable attitude towards the German language. The other variables, 'Linguistic identification' and 'Non-interactive L1 contact', only correlated moderately with 'Education'.

The following variable, 'Attitude', correlated with all other variables. There was a moderate correlation with the 'Linguistic identification' and 'Non-interactive L1 contact' variable, while 'Interactive L1 contact', 'Age of Arrival' and 'Length of Residence' correlated moderately strong. The correlation between the latter three variables and 'Attitudes' emphasises that the amount and frequency of German used with family and friends, as well as the 'Age of Arrival' and 'Length of Residence', affects the attitude towards the German language. Lastly, the 'Education' variable exhibited a correlated strongly with 'Attitudes'.

The 'Age of Arrival' variable correlated with almost every other variable. 'Linguistic identification' and 'Non-interactive L1 contact' were moderately correlated with 'Age of Arrival', suggesting that the later the participants arrived in Cape Town, the more they identified with the German language and maintained contact with German through different media. Moreover, 'Education', 'Attitudes' and 'Length of Residence' correlated moderately strong with 'Age of Arrival', highlighting that the older the participants were when they arrived in Cape Town the more favourable their attitude towards shorter residence in the L2 country, towards German, and German-schooling background.

The last variable, 'Length of Residence', correlated moderately with 'Linguistic identification' and 'Attitudes', and moderately strong with both 'Education' and 'Age of Arrival', suggesting that the longer the length of residence, the fewer years of (monolingual) German schooling.

5.5 Background variables predicting performance on the Picture Naming task

In order to determine the influence of the individuals' background on their L1 lexical development in a bilingual setting, a series of Pearson correlation tests was run with the background variables as independent variables and the PNT scores as dependent variable. To ensure consistency, Cohen's (1988) rule of thumb was used to characterise the strength of the relationship between variables.

As seen in Table 5.4 below, five independent variables exhibited a highly statistically significant effect on PNT performance: ‘Interactive L1 contact’, ‘Non-interactive L1 contact’, ‘Education’, ‘Attitude’ and ‘Age of Arrival’.

Table 5.4 Pearson correlation: Independent variables and Picture Naming Task

	Interactive L1 contact	Linguistic identification	Non-interactive L1 contact	Education	Attitudes	AOA	LOR
PNT	-0.608**	-0.378	0.621**	-0.777**	-0.829**	0.530*	-0.341

*. Correlation is significant at the 0.05 level

**.. Correlation is significant at the 0.01 level

However, as seen in the previous section (see Table 5.4), several of these variables were also highly inter-correlated, which obscures the exact, individual influence each of them had on PNT scores. For this reason, partial correlations were run so as to isolate the effect of each variable, factoring out the potentially confounding effects of the other variables. Following common statistical conventions, a cut-off point of $r > .60$ was chosen. The correlations which are affected by this cut-off point are ‘Interactive L1 Contact’, ‘Non-interactive L1 contact’, ‘Education’, ‘Attitudes’, ‘Age of Arrival’ and ‘Length of Residence’.

Table 5.5 Partial correlation with the relevant variables factored out: Independent variables and Picture Naming Task

	Interactive L1 contact	Linguistic identification	Non-interactive L1 contact	Education	Attitudes	AOA	LOR
PNT							
>.60	-0.085	-0.378	0.621**	0.464*	-.276	.001	-0.341
Control for:	Att			Att; AoA; LOR	Intr.Con; Edu;AoA	LoR;Edu; Att	

*. Correlation is significant at the 0.05 level

**.. Correlation is significant at the 0.01 level

In Table 5.5, a partial correlation was run on ‘Interactive L1 contact’ controlling for ‘Attitudes’, which exhibited no statistical significance. The following partial correlation was conducted on ‘Education’ controlling for ‘Attitudes’, ‘Age of Arrival’ and ‘Length of Residence’ which resulted in a highly statistically significant effect. The next partial correlation was on ‘Attitudes’

controlling for ‘Interactive L1 contact’, ‘Education’ and ‘Age of Arrival’ and exhibited no statistical significance. Lastly, a partial correlation was run on ‘Age of Arrival’ controlling for ‘Education’, ‘Attitudes’ and ‘Length of residence’, resulting in no statistical significance. No partial correlation was necessary for ‘Non-interactive L1 contact’ as it did not correlate significantly with other independent variables (see table 5.3). As such, after the partial correlational procedure, only two independent variables exhibited a statistically significant effect on PNT performance: ‘Non-interactive L1 contact’ and ‘Education’.

The first of these variables is ‘Non-interactive L1 contact’, which showed a positive relationship with the PNT score, thus suggesting that a higher degree of contact with German through different media led to a higher PNT score. According to Cohen’s (1988) rule of thumb for interpreting correlational magnitude, ‘Education’ correlated moderately strong with ‘Interactive L1 contact’, ‘Age of Arrival’, and ‘Length of Residence’, after conducting a partial correlation (see Table 5.5). As a result, ‘Education’ exhibited a significant positive relationship with the PNT score, therefore indicating that more access to German schooling increased the PNT scores.

5.6 Background variables predicting performance on the VFT

Similarly as for the PNT, a series of Pearson correlations was run with the background variables to see if any of them could predict VFT scores. As seen in Table 5.6 below, five independent variables exhibited a statistically high significant effect on the VFT performance: ‘Non-interactive L1 contact’, ‘Education’, ‘Attitude’, ‘Age of Arrival’ and ‘Length of Residence’.

Table 5.6 Pearson correlation: Independent Variables and Verbal Fluency Task

	Interactive L1 contact	Linguistic identification	Non-interactive L1 contact	Education	Attitudes	AOA	LOR
VF	-0.248	-0.398	0.508*	-0.854**	-0.691**	0.645**	-0.635**

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

However, as in the case of the PNT analyses above, the fact that several of the independent variables were inter-correlated had to be taken into account. To deal with this multicollinearity, partial correlation were run on independent variables exhibiting inter-correlations $r > .60$ (see Table 5.7).

The first partial correlation concerned the impact of ‘Education’ after controlling for ‘Attitudes’, ‘Age of Arrival’ and ‘Length of Residence’. This variable still exhibited a statistically significant effect on VFT, suggesting that schooling in German goes hand in hand with the VFT scores. Another variable that showed a statistically significant effect on the VFT was ‘Non-interactive L1 contact’. No partial correlation was needed for this variable as it did not significantly correlate with other independent variables (see Table 5.3).

Regarding the remaining variables ‘Attitudes’, ‘Age of Arrival’ and ‘Length of Residence’, partial correlations were run accordingly, yet no statistically significant effect was documented (see Table 5.7). In the end, the two variables that exhibited a statistically significant effect on the VFT performance were ‘Non-interactive L1 contact’ and ‘Education’.

The ‘Non-interactive L1 contact’ variable showed a positive effect, thus indicating that a high degree of contact with German through different media led to a higher VFT score. The second variable ‘Education’ correlated moderately strong with ‘Attitudes’, ‘Age of Arrival’ and ‘Length of Residence’ (see Table 5.7) which suggests that schooling in German gave rise to higher VFT scores.

Table 5.7 Partial correlation with the relevant variables factored out: Independent variables and Verbal Fluency Task

VF	Interactive L1 contact	Linguistic identification	Non-interactive L1 contact	Education	Attitudes	AOA	LOR
>.60	-0.248	-0.398	0.508*	0.606**	- 0.185	0.128	0.203
Control for:				Att;AoA; LoR	AoA; LoR; IntrCon; Edu	LoR; Att; Edu	Edu; AoA

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

5.7 Qualitative analysis of three participants’ data

As seen in Table 5.3, the linguistic background variables consisted of a wide range of correlations on a group level. In what follows, selected individual examples will showcase the impact of the linguistic performance on the individual level and the respective PNT and VFT

results. The following participants were chosen as they represent and reveal a variation and diversity in performance based on their linguistic background, especially focusing on language contact and use. For this reason, predictor variables relating to language contact and use played a key role and these include: ‘Interactive L1 contact’, ‘Non-interactive L1 contact’ on the one hand and ‘Education’ and ‘Attitude’ on the other.

Participant #4

Participant #4 was in his late twenties when he immigrated to South Africa, and at the time of testing, had been residing in South Africa for 15 years. He completed his high school and university education in Germany and is now working in South Africa.

Table 5.8 Summary of selective background and sociolinguistic variables of Participant #4

Predictor variables	Individual score	Group mean
Interactive L1 contact	3	2.92
Non-interactive L1 contact	3.85	1.98
Education	1.88	1.99
Attitudes	2.92	2.71

According to the participant’s first index (index value 3), he appears to interact and communicate to the same extent in his L1 and L2 with his family and closest relatives slightly more than the group average (mean=2.92). This is surprising as he is married to a German speaker and the majority of the family is German speaking too. Moreover, his fluency in multiple languages (as well as his spouse’s multilingualism) allows them to communicate in these languages interchangeable, with family, friends and, when appropriate, even within the work environment. In contrast, the participant’s second index (non-interactive L1 contact) is the highest index of the group. This index (index value=3.85) suggests that he is continually in contact with his L1 by means of books, television, other printed media and German native-speakers on account of his work relationships. The last index (education) shows that the medium of schooling was predominately in the L1; therefore ensuring his L1 linguistic repertoire is complete and proficient.

Table 5.1 distributes the PNT scores into categories of response accuracy. Participant #4's score, a 91.2% accuracy, places him in the second column. His 'Non-interactive L1 contact' index, revealing his continuous and regular exposure to German writings and other forms of media especially due to his work, may account for his high PNT score. Furthermore, his 'Education' index exhibits his advanced L1 knowledge and skill, as his index (see Table 5.8) is one of the highest of the group, emphasising that a strong L1 educational background, in particular being exposed to the L1 as a medium of instruction, can solidify and consolidate the linguistic repertoire. The VFT scores, on the other hand, revealed some surprising results. Table 5.2 distributes the VFT scores of the individual participants into four columns where the majority of participants are situated within the second column. Participant #4 named 20 items within the given time. This is slightly below the group average of 21 items within the given timeframe. While 'Non-interactive L1 contact' and 'Education' exerted a robust statistically significant effect on the VFT on a general group level (see Table 5.7), is it weak on an individual level for Participant #4.

Participant #6

Participant # 6 was born in South Africa to German immigrant parents. He attended a German primary school and a bilingual high school (English/German). He then completed his degree at an English university in South Africa, and is now working in South Africa.

Table 5.9 Summary of selective background and sociolinguistic variables of Participant #6

Predictor variables	Individual score	Group mean
Interactive L1 contact	2.14	2.92
Non-interactive L1 contact	2.12	1.98
Education	2	1.99
Attitudes	2.42	2.71

Participant's #6 first index (index value 2.14) suggests that he uses his L1 more frequently with family and relatives than the group does on average ($m=2.92$). He is married to a German speaker and speaks German to his spouse and to his closest relatives. However, at work he indicated that he uses English and Afrikaans, and only on occasion German and other languages when communicating with overseas clients. The following index (non-interactive L1 contact)

signifies that Participant #6 is in contact with German books, magazines and other printed press above the average of the group ($m=1.98$). He even indicated that he watches *Deukom* (German television) at least one hour a day and frequently reads German novels, thus continually stimulating L1 maintenance. With the last index (education), Participant #6's educational was in a bilingual setting with the L2 as the language of instruction. Although the medium of instruction for the majority of his adolescent educational development was bilingual (English/German), his primary school was solely in German, thus possibly establishing a fairly robust L1 linguistic repertoire in a L2 context.

As for Participant #6's, PNT score revealed a 93.7% accuracy response, which places him within the second column of Table 5.1. What is of note is that Participant #6 outperformed Participant #4 in the PNT. This is interesting as Participant #4 is considered a native German speaker while Participant #6 is considered a (German) heritage speaker. Participant #6's contact indices reveal that he is regularly in contact with the L1, in terms of books and German television. Moreover, he uses his L1 in the work environment and at home in as much a monolingual way as possible. Moreover, his 'Education' variable reveals that the majority of his schooling was within an L1 educational system where, naturally, the medium of instruction was in L1. The factor that seemed to most influence his overall PNT score, and with that his access and contact to the language, was his overall attitude index (index value=2.42). Although the 'Attitude' index did not exert a significant effect on the PNT on a group level, for Participant #6 the attitude factor may partly account for his high PNT score. (A further analysis on the influence of the 'Attitude' factor will be given in the following chapter — Chapter 6).

Similar to Participant #4, Participant #6's VFT scores are somewhat surprising too. Table 5.2 distributes the VFT scores and Participant #6 named 16 items within the given timeframe, which is below the group average of 21 items.

Participant #10

Participant #10 was born in South Africa and is the third generation of German immigrants to South Africa. She attended a bilingual (English/Afrikaans) primary and high school and then completed her degree at an Afrikaans university in South Africa, and is now working in South Africa.

Table 5.10 Summary of selective background and sociolinguistic variables of Participant #10

Predictor variables	Individual score	Group mean
Interactive L1 contact	3.2	2.92
Non-interactive L1 contact	0.85	1.98
Education	3.25	1.99
Attitudes	3.92	2.71

According to the participant's first index (index value 3.2), she appears to use both her L1 and L2 when interacting with family and friends. However, she indicated that she only uses her L1 when speaking to her closest relative and the majority of her friends are Afrikaans or English speaking. In fact, she admitted that now she only speaks German to her grandmother and has switched to speaking Afrikaans with her parents and siblings. The second index (index value 0.85) documents her lack of contact as she has the lowest score on this index in the group. Any contact to books, magazines or other printed media is extremely minimal. The small amount of contact is watching *Deukom* when visiting her relatives once a year in the east of South Africa. Participant #10 further indicated that reading and writing is difficult for her and therefore she avoids any form of German literature and written communication. This is not surprising as the third index (index value = 3.25) shows that she never attended a school with German as medium of instruction, she never had German as a subject in school and she only learned some L1 literary skills with the help of family members.

As can be seen in Table 5.1, Participant #10's PNT scores were on the lower end of the column, revealing a 61.2% response accuracy. Whilst her score is not the lowest score of the group, Participant #10's indices clearly account for the difficulty in retrieving and accessing L1 items in the PNT. Perhaps the most interesting index (see Table 6.3) is 'Non-interactive L1 contact' (index value 0.85), as this is the lowest of the group. The lack of access to L1 sources can be viewed as twofold: 1) the unfamiliarity of L1 establishments that offer such access (e.g. bookstores) and 2) the inability to properly comprehend the written language as her 'Education' index reveals a complete lack of exposure to L1 instruction and education. Furthermore, as for Participant #10's VFT score, the results concur with the indices. The lack of intense exposure to L1 input, both via books and other printed and visual media and education, may account for her low VFT and PNT scores.

5.8 Summary

The first part of this chapter presented descriptive statistics on the two language tasks used, namely the PNT and the VFT. Results were presented pertaining to each task (Table 5.1 and 5.2), as well as participants common responses and errors. The following section introduced each independent variable and its indices, based on the responses on the sociolinguistic and personal background questionnaire. Inferential statistics based on Pearson correlations were used to scrutinize the relationship between these variables, revealing strong correlations between several of them (see Table 5.3). The next section went on to run partial Pearson correlations between the independent variables and the participants' performance on the PNT and VFT. Interestingly, in these latter analyses, the independent variables 'Non-interactive L1 contact' and 'Education' exhibited statistically significant effects on both picture naming and verbal fluency performances on a group level. Qualitative examples were given from individual participants to demonstrate differences within the group. The following chapter will discuss the significance of the results and offer possible explanations.

¹Cohen's (1988) rules of thumb: weak = $0 < r < 0.20$; moderately weak = $0.20 < r < 0.40$; moderate = $0.41 < r < 0.60$; moderately strong = $0.61 < r < 0.80$; strong = $0.81 < r < 1.0$.

6. Discussion

6.1 Introduction

The objective of this chapter is to discuss and explain the results of the study as presented in the previous chapter (Chapter 5). In particular, it examines the research question, brought forth in Chapter 4 (section 4.2) of the current study, in relation to a variety of individual background factors on L1 development in a bilingual context. The first section (6.2) focuses on the effects of the ‘Non-interactive L1 contact’ variable, followed by the second section (6.3) which discusses the effect of the ‘Education’ variable. Both variables exerted a significant effect on performance on the formal tasks. Lastly, the main findings will be summarised in the last section (6.4).

As seen in the previous chapter, the results revealed that out of the background and sociolinguistic factors tested, ‘Non-interactive L1 contact’ and ‘Education’ exerted the most robust influence on L1 development in a bilingual setting. Since the same variables influenced both proficiency tests, the following discussion will treat the proficiency measures as one inasmuch as possible. Occasionally reference to individual variation, as indicated in Chapter 5 (section 5.7) will be made. The PNT and VFT will therefore, from here onward, be referred to as “formal tasks/scores/results”.

6.2 The effects of ‘Non-interactive L1 contact’

The significant effects of ‘Non-interactive L1 contact’ on the formal tasks are quite surprising while the lack of significant effects of the ‘Interactive L1 contact’ effect is also unexpected. Considering the Activation Threshold Hypothesis, which postulates that a lack of contact leads to language loss, the usage of the L1 on a daily basis prevents language loss. Also, the ATH predicts that frequent usage (activation) of the L1 will facilitate easy access and retrievability of the targeted language item. In essence, the hypothesis postulates that the more the L1 is used (i.e. activated) on a regular basis, the less susceptible the speaker is to language loss. Thus far, the ATH appears to be obvious and intuitively convincing, and yet the phenomenon of language contact and use is far more complex and multifaceted. Schmid and Jarvis (2014:2) point out that one cannot only consider the frequency and recency of the language use, one must also consider the context of use (i.e. formal/informal setting) and one’s interlocutor or audience (i.e. monolingual or bilingual speaker). Alongside the latter of the before mentioned factors, one also

needs to consider the quality of the language input. Exposure and input to the language is important, however what is of even more importance is the quality and accuracy of input (i.e. native vs. non-native input). The ATH does not account for the quality of contact, and rather categorises all types of contact together. It is for this reason that one needs to look closer at the quality of the contact contained in ‘Interactive L1 contact’ and ‘Non-interactive L1 contact’.

Although both these variables (‘Non-interactive L1 contact’ and ‘Interactive L1 contact’) are *contact* variables, meaning they promote exposure and access to the language, they do differ in several respects. For one, ‘Interactive L1 contact’ readily allows L2 interference and CLI. The reason for this is that in communicative interaction between two individuals, switching and mixing languages is more likely to occur if both interlocutors are bilingual. This aligns with De Leeuw et al.’s (2010) study. De Leeuw et al.’s (2010) study found that L1 contact in communicative settings where code-mixing and code-switching was inhibited promoted maintenance and stability in the L1. The authors explain this type of settings as ‘formal’, especially in a work environment or correspondence with native German speaker residing in Germany. What this means is that no L2 interference or CLI is allowed since the interlocutor does not comprehend nor has knowledge of the L2, and it may well be inappropriate to communicate interchangeably in several languages in a formal work environment. For this reason, De Leeuw et al. (2010) therefore conclude that situations and settings where code-switching is not permitted or less likely to occur, are favourable towards language maintenance and, in turn, retards language loss.

Further studies done by Schmid and Jarvis (2014), Schmid (2007) and Schmid and Dusseldorp (2010) support these findings, emphasising that in a professional context code-mixing and code-switching is considered inappropriate, thus inhibiting the L2 and disallowing any ‘intrusion’ from the competing language. In essence, L1 contact in communicative settings that allow any sort of code-mixing and code-switching does not facilitate language development and maintenance.

Within the present research, the ‘Interactive L1 contact’ suggests that this form of contact (the use of L1 among friends and family of the bilingual) is more susceptible and amenable to crosslinguistic influence, such as codeswitching and language mixing. Within these types of informal contact situations between bilinguals there is prevalent L2 use and interference, which renders the L1 more susceptible to change under the influence of the L2 (Schmid 2011a). Subsequently, lexical substitution is easily facilitated through interactive contact with other

bilinguals, which in turn promotes disuse of particular L1 items and the overuse of the L2 items (Pavlenko 2004). This type of contact lends itself more to the bilingual language mode as suggested by Grosjean (2001) and Schmid (2007). In this mode both languages are highly active and language mixing, codeswitching and interference are frequent. The bilingual nature of the variable ('Interactive L1 contact') does not adequately lend itself to L1 development and maintenance.

The ATH and the 'Interactive L1 contact' variable are predominantly concerned with the frequency and recency of language use and exposure; in other words, quantities of language contact help to prevent language loss. However, the current results do not support this claim and can therefore confidently assume that quality of contact and input (i.e. native and monolingual interlocutors) is a necessary factor for L1 development and maintenance. The variable which encapsulates this is 'Non-interactive L1 contact', as it promotes 'native-like', 'intact' and monolingual L1 input and use.

This type of variable is strict with its parameters, in the sense that it typically only allows for communicative situations with monolingual input. Montrul (2008) poignantly points out that quality of input is required to be one, linguistically rich and varied as well as two, contextually appropriate, such as is found with monolingual interlocutors and monolingual input such as with *Deukom*. Exposure to this kind of monolingual L1 contact is therefore accessed via input such as 'native' literature and, of course, other printed and visual media input. This type of 'passive' input is seen as a reliable source of L1 'correctness' and keeping the L1 'intact', thus permitting the development and maintenance of the speakers competence level (Schmid 2011b). What is more, monolingual input continues to feed and shape language development and maintenance, as it promotes qualitative lexical and grammatical accuracy. It is therefore reasonable to assume that competence in the L1 linguistic systems plays an important role in language development, maintenance and loss. According to Bylund and Diaz (2012) and Köpke (2004a) knowledge or competence of L1 literacy skills may lead to a higher resistance to language loss.

With this in mind, the Activation Threshold Hypothesis predicts that competence is retained longer than performance. Competence underlies performance, and performance involves three things: comprehension, production and grammatical judgments. In simple terms, language competence pertains to the underlying (implicit) linguistic knowledge, whereas performance problems relate most frequently to lexical retrieval difficulties. As such, language loss is documented at the level of production (performance) first, especially within the lexical domain.

What this suggests within language loss research is that the lexis is affected by a ‘forgetfulness’ and a type of ‘atrophy’ rather than a loss of deep linguistic knowledge.

While this may hold true for adult L1 speakers, who have acquired such deep linguistic knowledge and may have simply ‘forgotten’ certain lexical items, the issue at hand is how to attain and maintain such deep linguistic competence. For one, attaining an extensive competence level in the L1, or in any language for that matter, is possible through acquiring literacy skills. Typically, acquiring linguistic competence in the L1 is achieved through implicit learning (Paradis 2004). What this means is that through extensive exposure and input, from birth and throughout the critical period, the speaker acquires the L1 in its monolingual and ‘native-like’ state by means of first understanding and then applying the relevant skills and knowledge repetitively in an unconscious way. While this may explain the high formal task results for select participants, the low formal task scores may be the result of numerous factors. A possible explanation is that participants may have forgotten the name of a certain item. Also some participants might simply be slow in naming the items, while others did not know the name of the item. For the latter reason, one can only speculate that the younger the participant was when arriving or at the onset of bilingualism, the possibility increases that they did not fully acquire the L1. In turn, the inability to name an item does not necessarily reflect loss of L1 competence. In fact, this knowledge may not have been mastered in the first place and the limited access to the L1 lexis could be a manifestation of an incomplete L1 learner. These speakers experienced a break from L1 contact before full proficiency and deep linguistic knowledge could be fully acquired (Bylund 2009, 2014; Montrul 2008). In essence, the fundamental aspect of attaining a deep linguistic knowledge is that it subsequently promotes L1 development and maintenance, and can become a protective mechanism against language loss. The means to entrench such knowledge is through qualitative L1 input and contact during early stages of language development. In regards to the results, the ‘Non-interactive L1 contact’ effect on the formal tasks supports the conclusion that quality input and intense exposure as well as access to printed and audiovisual media has a positive effect on formal task performance. This type of input also limits the amount of L2 interference (i.e. code-mixing and code-switching) and ultimately promotes L1 development and maintenance.

In a similar vein, the access to, exposure to, and use of monolingual, ‘native-like’ L1 sources can be likened to contact in a monolingual mode (Grosjean 2001). Frequently operating in this mode can establish and cement L1 proficiency skills and inhibit any L2 interference. This mode also allows an individual to practise communicating in native-like, monolingual form with other

native language speakers. However, a lack of L2 interference (i.e. code-mixing, code-switching and inserting loanwords) does not mean one is operating in a monolingual mode. In fact, it is more likely that the activation level of an item is high, thus facilitating easy access. Conversely, at low activation level of an item, it becomes more difficult to access, due to infrequent use and lack of stimulation of the L1 item(s). According to Paradis (2001, 2007), as briefly discussed above, the ATH predicts that comprehension will be retained longer than production, since the latter requires a lower threshold than the former. With regards to the ‘Non-interactive L1 contact’ variable and the ATH it could be said that monolingual and ‘native-like’ input, through L1 audiovisual media and literature, establishes a large comprehensive, entrenched linguistic repertoire, able to withstand deterioration of the language.

As seen in the above discussion, there are two distinct types of language contact and ways of input variables. Although they are considerably different, ‘Interactive L1 contact’ and ‘Non-interactive L1 contact’ are two sides of the same coin. This simply portrays the idea that they each serve a distinct function and vary in features, they are nonetheless united in the notion that contact is influential in L1 development, maintenance and loss.

6.3 The effects of ‘Education’

This thesis looks at the ‘education’ variable from a novel angle. Particular to this study, the ‘Education’ variable concerns itself primarily with the medium of instruction. This is somewhat different to other studies where the education variable looks at the level of education rather than the media of instruction. Previous studies have concluded that those with a higher education level will outperform those with a lower education level (Köpke & Schmid 2004; Schmid & Dusseldorp 2010). However, this distinction is not as relevant in the present study, since all participants attended and received a university degree (except for Participants #8, #11). Another crucial observation to this variable is that several variables are in fact embedded within the ‘Education’ variable, which speaks to the very nature of this variable. The fundamental nature of the ‘Education’ variable is that it is comprised of different components, such as ‘Age of Arrival’, ‘length of residence’ and even ‘Attitudes’, which allows it to become a powerful variable with substantial effects on formal task performance. Nonetheless, the variable gives credit to the importance massive input received during a critical time in an individual’s language development, such as schooling, for long-term language development and maintenance.

While the above observations are important, what is more central and relevant to this discussion is the *medium of instruction* in the institutions of learning, such as elementary school and high school as well as universities. The more access to German as a medium of instruction and a longer period of time spent immersed in a German speaking education system can properly consolidate L1 literacy skills, proficiency and language knowledge. What is more, the formal task scores reflect this entrenchment, as the top scoring participants had been in *contact* with the language extensively via their education, while the lower scoring participants lacked (any) contact with the language via educational means. For the former group, this in turn might have given them enough knowledge to maintain a sufficient L1 linguistic repertoire that would sustain them in an L2 environment with a competing L2 system. In fact, Montrul (2008:132) poignantly states that via the educational system, i.e. L1 schooling, children are taught and develop phonological awareness, which will become a prerequisite for reading alphabetic writing systems as well as narrative skills and knowledge of textual and structural conventions. Such a background, with continuous intense contact with L1 writings and speech within an educational setting, may substantially help establish and stabilise the L1 linguistic system. Schmid (2007) likens this to a kind of saturation point of rehearsal where the knowledge of the linguistic system is rehearsed extensively, such as in a classroom, in a monolingual setting and ultimately reaches a point of stabilisation. If such a point is reached, L1 maintenance depends more on quantity and quality of contact. It can therefore be said that education plays a significant role in the resistance and retardation of language loss, even in an L2 dominant environment (Köpke & Schmid 2004).

With this in mind, a crucial factor embedded within the 'Education' variable is the age effect, and with that, the time when the exposure of input began. The time at which 'educational' input begins is important, since the longer a child has the opportunity to receive an extensive amount of input and makes use of the language, the higher the degree of language maintenance later in life (Montrul 2008). The age and the length of exposure (time) of L1 input via educational means, may well contribute in solidifying linguistic competence at a young age which in turn may retard language loss. On the other hand, the age at which an individual breaks from L1 exposure and its environment, the greater L1 loss the individual may experience (Bylund 2014; Montrul 2008). Montrul (2004, 2008) clearly explains that if L1 input is interrupted, if reduced altogether at a young age, the degree of language loss is directly linked with the age of reduced L1 contact (or onset of bilingualism). As a result, it should come as no surprise if a young individual who experiences a break in L1 input (such as an immersion into a new language community) is most likely be affected by incomplete L1 acquisition. The role of input and its

timing is fundamental in (bilingual) language development since it demonstrates that the absence of a qualitative L1 speech community (such as German schooling in the current research), and only input from family members or close relatives, is not sufficient for young speakers to develop, let alone maintain, full linguistic competence and abilities. The result is incomplete L1 acquisition. A lack of substantial L1 input impedes the developmental process and any attempt at language maintenance at a later stage in life will be met with great difficulty. Moreover, Montrul (2008) explains this by emphasising that if incomplete L1 learners receive little to no academic input in the L1 and miss the chance to not only be exposed but to also acquire aspects of grammar that can only be imparted or taught at school (such as complex sentence structures and complex tenses), then these speakers are at a great disadvantage later in life.

Another important aspect of education that affects the participants, and in turn may account for the formal tasks scores, is knowledge of the written code. The written code is a different form of representing the language: oral form versus written form. The latter is a type of monolingual contact to the language, whereas the former may become easily susceptible to CLI and other factors. Köpke (2004a) remarks that there is a perceived prestige attached to the language which in turn may affect the attitude of a speaker and increase the motivation for L1 maintenance. The familiarity with the written code offers contact to the language and culture as well as a source of input. Extensive L1 exposure in a formal setting, such as in school and in other educational institutions, is crucial, and it is even more crucial during a specific period in time in an individual's language development. Substantial L1 input during the Critical Period is fundamental in long term language development. A vital form of input is therefore the acquisition and comprehension of the written code. It expands the vocabulary and offers a quality of language that promotes and fosters language knowledge and proficiency. According to Montrul (2008:132-133) school not only offers young speakers the opportunity to learn how to read and write, it also helps turn them into mature and literate speakers and writers. Moreover, reading and writing contributes to and reinforces the expansion of children's lexical and grammatical growth as well as learning how to use the language in different contexts and forms (i.e. academic vs. non-academic language use).

However, there is a pivotal step that first needs to be taken, which is acquiring and learning the written code. Access to L1 education provides young learners with the basic knowledge and skills, such as reading and writing, necessary to attain proficiency. What is more, the quality and amount and frequency of input the learner is exposed to is encapsulated in 'education'. For one, the quality of input, within a school setting, contains contextual and structural variety as well as

accuracy. The quality of input may well be on par, or is as close as possible, to a native, monolingual speaker. And two, the amount or frequency of L1 input, received within the schooling system, is closely linked to the length of exposure to such crucial input. Exposure to the written register or written code is reinforced at school through literacy which in turn, because of qualitative and extensive amount of input, establishes a deep linguistic competence of the L1. As already mentioned above, any sort of interruption or break from the developmental language process will stunt such development and not only cause an unconsolidated L1 linguistic repertoire it also leaves the language system vulnerable and susceptible to L2 interference and consequently leads to L1 loss. While Schmid's (2007) conclusion, of an individual reaching a 'point of saturation' and thereafter rehearsal of linguistic knowledge and skills no longer being necessary, might hold true for those individuals who have fully acquired the L1. However, such a conclusion might not be applicable to incomplete L1 learners. In fact, incomplete L1 learners lack the extensive L1 input required to master the written code and attain full proficiency of the L1. Interruption in L1 input during the early years may in turn affect not only language production but also linguistic competence and may leave substantial gaps in certain areas of the L1 which may manifest itself first as difficulty retrieving lexical items (Montrul 2008). With this lack of input and use, it would be reasonable to assume that incomplete L1 learners may in fact become receptive bilinguals, who seldom speak the language nor write or read it. The amount and quality of input, to avoid the latter occurrence of incomplete L1 acquisition, seems to largely depend on the age (timing) of exposure and the frequency of input including how the input is received (i.e. school, books, media, etc.)

From the above discussion the multifaceted nature and complexity of the 'Education' variable has become increasingly evident. The strength of the 'Education' variable's effect on the formal tasks and on the other variables cannot be ignored. As can be seen in the Pearson correlation matrix in Chapter 5 — Table 5.3, the 'Education' variable strongly correlated with almost all other variables, but especially with 'Age of Arrival' (moderately strong = $61 < r < 0.80$), 'Length of Residence' (moderately strong = $61 < r < 0.80$) and 'Attitude' (strong = $81 < r < 1.0$).

As already briefly mentioned above, the age effect plays an important role in the L1 development of a young speaker. The younger an individual is (i.e. before 12 years of age) upon arriving in a new linguistic environment, the more likely the L1 knowledge of the language becomes impervious to incomplete acquisition and/or language loss. To a certain extent,

Participant # 10 demonstrates this pattern since it can be assumed that language contact and input was limited in her early years therefore noticeably hindering her L1 development process. The formal task results of Participant #10 illustrate to this lack of intense L1 input (see Chapter 5 — section 5.7). Consequently, the space for such an intense L1 input and exposure is found within the educational system. Once again, access to L1 education and L1 as a medium of instruction provides input in its monolingual form throughout a particular and crucial time of L1 development, showing that ‘Education’ and ‘Age of arrival’ are not only intrinsically connected but also demonstrating the strength of the ‘Education’ variable, since any isolated effect of the ‘Age of arrival’ variable is embedded within the ‘Education’ effect. Separating these two variables would be detrimental to the results and may not give an adequate picture for distinguishing between attriters and incomplete L1 learners.

Similarly to ‘Age of Arrival’, ‘Length of Residence’ is embedded in the ‘Education’ variable too and its effect disappears once conducting a partial Pearson correlation on both formal tasks (see Table 5.5 and 5.7). The seminal study of De Bot et al (1991) concluded that ‘Length of Residence’ may have an effect if language contact is limited or nonexistent, and sufficient contact to the L1 during the first five to 10 years of emigration is crucial in language maintenance. Participant #6 (as well as Participants #12 and #15) exhibit that ‘Length of Residence’ does not have an effect on language development and maintenance when intense and extensive L1 contact and input is present. Moreover, the effect of the ‘Length of Residence’ variable is also contingent on the age of arrival or the age of reduced L1 contact. Bylund (2009) noted that around 12 years of age the language stabilises and that any sort of language loss is established at this time. Thereafter no additional time without L1 contact will substantially increase the level of language loss. In sum, for participants who arrived in the L2 context well after 12 years of age, the ‘Length of Residence’ variable has little to no effect on language development, maintenance or loss.

Another variable embedded within the ‘Education’ variable is ‘Attitude’ and this inter-relationship within the Pearson correlation matrix is the strongest among all other variables — see Chapter 5, Table 5.3. Similarly to the previous variables discussed, the effect of the ‘Attitude’ variable disappears within the partial Pearson correlations. A strong possible reason for this is in fact that ‘Education’ is comprised of attitudinal components. This suggests that as one is immersed in the L1 schooling system the L1 is elevated to a prestigious status and in turn promotes L1 development and maintenance (Bylund & Diaz 2012; Köpke 2004a).

Furthermore, it can be said that positive attitudes towards the L1 language and culture may be favourable towards L1 development and maintenance and deter L2 interferences (Ben-Rafael & Schmid 2007; Köpke 2007). Participant #6's 'Attitude' index (index value 2.42, see Table 5.9) suggests that a favourable attitude towards the L1 can partly account for his high formal task results, especially his PNT score. The development of his attitude may well have been fostered due to his substantial amount of entrenchment in the L1 schooling system and having a long-lasting developmental effect, even into adulthood. On the other hand, Participant #10's 'Attitude' index (index value=3.92, see Table 5.10) suggests that an unfavourable attitude towards the L1 language and culture can be detrimental in language development and maintenance. A lack of exposure and access to the L1 schooling system may well be a possibility for accounting for Participant #10's undeveloped L1 system which is exhibited in her poor formal task performance. A speaker's attitude towards the L1 is not to be underplayed as studies have suggested that an individual's attitudes towards the L1 (and the L2) can influence the degree of language loss (Ben-Rafael & Schmid 2007; Köpke 2004a; Schmid 2002).

Lastly, closely alongside the 'Attitude' variable is the 'Linguistic identification variable. This variable relates closely to the 'Attitude' variable since it refers to the importance the individual attaches to the use and associations made with the L1. Table 5.3, in Chapter 5, shows that there are significant correlations with 'Education', 'Attitudes', 'Age of Arrival' and 'Length of Residence'; however any effects of the 'Linguistic identification' variable were obscured by the other variables, especially once the partial-Pearson correlations were run. As such, this variable showed no significant effect on any formal task results.

6.4 Summary

We have suggested that the effects of the 'Non-interactive L1 contact' and 'Education' may be explained in the following way. The 'Non-interactive L1 contact' variable proved that intense receptive input such as reading German books and other German visual media were crucial in language development and maintenance as well as proficiency, since these types of input are seen as purely monolingual and disallowing any L2 interference. On the other hand, 'Interactive L1 contact' allows and permits L2 interference weakening any monolingual input and possibly hindering the expansion and development of the L1 lexis.

The second variable which had a significant effect on formal task performance was the 'Education' variable. This variable demonstrated that exposure to German as a medium of instruction within an educational setting is fundamental in language development and

proficiency. Literacy skills, such as knowledge of the written code, showed to be an important factor in the development and maintenance of the L1 lexis and overall proficiency of the L1. This may suggest that competence in the written code manifested in high formal task scores, such as in the case of Participant #4 and #6. Another crucial factor proved to be the medium of instruction which provides intense input in 'pure', monolingual language therefore promoting L1 development and proficiency. However, the age effect and the length of residence in an L2 context as well as the attitudinal component played an important role in the substantial effect of the 'Education' variable on the formal task results.

In sum, neither the 'Non-interactive L1 contact' variable and the 'Education' variable allow nor permit any code-switching or code-mixing and are considered to be a form of German monolingual input, thus cementing L1 knowledge and skills and proving to be beneficial for long-term language development and maintenance. In the end, it can be concluded that L1 speakers must construct, develop or maintain a linguistic repertoire based on the input they received at an earlier stage in life.

7. Conclusion

This chapter provides a summary of the findings (7.1) of the study reported in this thesis. Subsequently, the limitations of the study and its materials will be discussed (7.2), and suggestions for future studies will be presented (7.3).

7.1 Summary of Results

The study explored lexical proficiency and development in L1 German bilingual speakers residing in the Cape Town, Western Cape. Particularly the paper assesses the degree to which German L1 contact influences lexical development and maintenance, alongside other background factors (age of reduced L1 contact, length of residence in the L2, education level) and sociolinguistic factors (attitude towards the L1, language use and contact). To do so, the study drew on methods commonly used in the study of L1 development as well as L1 loss in a L2 context or in bilingual speakers. The sociolinguistic and background questionnaire elicited personal and linguistic background data of the participants. Lexical data were elicited through a Verbal Fluency Task (VFT) and a Picture Naming Task (PNT) respectively.

In general, the results point to two key variables influencing L1 development in bilingual speakers. The first variable ‘Non-interactive L1 contact’ proved to be an important factor in both formal tasks. Intense receptive input, such as reading German books and exposure to other German visual and audio media, promotes L1 development and facilitates language proficiency and maintenance. The second variable ‘Education’ was shown to be an important factor in both formal tasks too. Exposure and access to German as a medium of instruction creates one, an environment of substantial L1 input two, the acquisition of L1 literacy skills and, three due to the entrenchment into the L1 schooling system, full attainment in proficiency of the L1 linguistic repertoire, without any interruption, is achieved. The findings therefore reveal that neither of these factors (‘Non-interactive L1 contact’ and ‘Education’) allow nor permit any code-switching or code-mixing and are considered to be a form of German monolingual input, thus cementing L1 knowledge and skills and proving to be beneficial for long-term language development and maintenance.

7.2 Limitations of the study

The current study made use of established tests and questionnaires (Bylund 2014; Schmid 2007; Schmid & Dusseldorp 2010) to elicit data, with the intention to use reliable and established methods, such as the Picture Naming Task, the Verbal Fluency Task and the C-test. Even so, these methods may pose challenges.

7.2.1 Participants

The difficulty of finding and recruiting participants is not unknown in the field of language loss research. It becomes even more difficult when the timeframe to find and perform the tests with the participants is extremely limited. The present study could only allocate two months for finding participants and eliciting the data. As such, only 22 participants were recruited. Furthermore, the 22 participants comprised of a diverse set of linguistic backgrounds as well as personal backgrounds, which created a heterogeneous group. Although the results were considered on a group level, individual results provided some insights into the reason for such diversity in the group. Another aspect to mention is that the majority of the sample group of 22 consisted of females. It was the females that responded to participate in the study, since they for one had time to participate because they were not working, and seem to place more importance on their own L1 development and maintenance (often wanting to pass on this knowledge to their children) than males do. Lastly, several participants withdrew from participation while others were reluctant to participate.

7.2.2 Materials

The materials and method used in this study have been implemented in similar studies in language loss research (Bylund 2014; Schmid 2007; Schmid & Dusseldorp 2010) ensuring validity and reliability. However, there are shortcomings to the materials and methods used. The sociolinguistic and background questionnaire resembles an 'auto-evaluation' or a self-assessment of the participant. Written questionnaires have a tendency to allow the participants to answer in a preconceived way that might seem proper or expected by society or even by their own standard. As a result, participants might not always answer truthfully or accurately, or

answer according to their current attitude towards the questionnaire and the L1. Although the written questionnaires are susceptible to these shortcomings, they are very useful in collecting general personal and linguistic background information.

The first formal task — the Picture Naming Task — is easy to construct and score but does have its limitations. Firstly, it is not how people use language naturally. The very formality of the task, naming items on a computer screen, puts the participant at a disadvantage: fear of failure or inability to perform the task correctly may hinder the participant's true linguistic skills. Another factor that had to be considered was that the sample group did include incomplete L1 learners. As such, it was concluded that the low PNT scores might not be due to inaccessibility and irretrievability of an L1 item, but due to the inability to access an item that had not been acquired beforehand. However, the PNT is a useful tool for investigating language loss in bilinguals as it can reveal valuable information.

The second formal task — the Verbal Fluency Task — does not require any extensive equipment and is easy to administer and score, and generally gives a fairly accurate indication of the lexical capacity of the participant. However, similar to the PNT, this is not how people use language in a natural setting and low VFT scores, within the current study, does not mean language loss per se. Like with the PNT, the inability to name L1 items within a given category may not lie with 'forgetfulness' or loss, but also with an incomplete L1 repertoire. That being said, the VFT is a valid and useful elicitation technique.

Although the C-test was administered to all the participants, the results of the C-test were not included in the overall results of the study. The C-test was referred to only by the researcher in order to have a better understanding of the participant's background, in particular to their writing skills.

7.3 Recommendations for future research

Language loss research aims at establishing incidences of L1 loss in migrants who have relocated to an L2 country. The language loss process is slow and subtle linguistic changes as well as other factors are involved in the process (Cherciov 2010). One of the major factors to influence the language loss process is language contact and use, as it plays a crucial part in L1 development, maintenance and loss on the linguistic system. The first linguistic domain to show changes, in bilinguals, is the mental lexicon. Studies investigating the L1 lexis have used

multiple methods and materials, alongside a combination of various socio-, psycho- and even neuro-linguistic influence to account for L1 loss.

The current study provides insight into L1 loss in bilingual speakers, which is, to the researchers' knowledge, within the current (South African) context still in its infancy stages. Future research should consider several aspects. One, sufficient time should be allocated to recruiting and performing the tests with the participants. Ideally, six months (if not more) would give the researcher enough time to find the right participants and administer the tests. Two, alongside more time, more participants could be tested which would increase the sample group size, and in turn avoid oversimplification and overgeneralisations. And three, an equal balance between male and female participants would create a more natural scenario than predominantly female participants. Furthermore, an interview could be beneficial in that it allows the participants to interact and use the language in a more natural and less formal way.

Finally it needs to be reiterated, within the parameters of the current study, that bilinguals are rarely equally fluent or balanced in all language skills in both their languages. As stressed by Grosjean (2001) and Schmid (2007), the language mode or language dominance is continually changing along the language continuum, depending on the communicative needs or ability of the bilingual. Language development, maintenance and loss largely depend on language (monolingual) usage, exposure and input, its environment and the extent of influence of the L2. Therefore, by studying language loss in diverse contexts we learn to re-assess the notions commonly used in language loss research, for example the role of L1 contact, and need to take into account how the specific characteristics of the context permeated the role that a given variable plays. In effect, different research contexts helps further research to problematise notions that initially were thought to be straightforward but are shown to be far more complex, for example how contact is conceptualised in the Activation Threshold Hypothesis.

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Appendix A

1. Sociolinguistic and Background Questionnaire (German Version)

(adapted from: Schmid 2007; Schmid & Dusseldorp 2010; Bylund 2014)

FRAGEBOGEN

Vorname:

Datum:

Mit diesem Fragebogen möchte Ich einen Eindruck von Ihrem Hintergrund bekommen und damit auch vom Sprachgebrauch deutscher Auswanderer in Südafrika. Er besteht aus 71 Fragen. **Sollten Sie denken, dass eine bestimmte Frage nicht auf Sie zutrifft (zum Beispiel, wenn Sie über den Sprachgebrauch Ihrer Kinder gefragt werden und Sie haben keine Kinder), können Sie Frage einfach durchstreichen.** Wenn Sie eine bestimmte Frage nicht verstehen, zögern Sie bitte nicht, mich zu fragen. Es gibt hier keine richtigen oder falschen Antworten!

ACHTUNG: Die durch den Fragebogen gesammelten Informationen werden vertraulich behandelt, nur zu Forschungszwecken verwendet, und werden unter keinen Umständen weitergegeben.

16. Wenn Sie einen Lebenspartner haben, welche Sprachen sprechen Sie mit ihm/ihr?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
17. Welche Sprachen spricht Ihr Lebenspartner mit Ihnen?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
18. Welche Sprachen sprechen Sie mit Ihren engsten Verwandten?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
19. Welche Sprachen sprechen Ihre engsten Verwandten mit Ihnen?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
20. Ist Ihrer Meinung nach die deutsche Sprache ein wichtiges Mittel um den Kontakt mit Ihren engsten Familienangehörigen aufrechtzuerhalten?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
21. Haben Sie in Südafrika im allgemein mehr südafrikanische oder mehr deutsche Bekannte?
 nur südafrikanische mehr südafrikanische gleich viel mehr deutsche nur deutsche
22. In welcher Sprache fühlen Sie sich am wohlsten?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
23. Fühlen Sie sich mehr zu Hause in der südafrikanischen oder in der deutschen Kultur?
 nur südafrikanische mehr südafrikanische gleich viel mehr deutsche nur deutsche
24. Welche Sprache hat den meisten emotionalen Stellenwert für Sie?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
25. Mit welcher Sprache identifizieren Sie sich am meisten?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
26. Spielt die deutsche Sprache eine wichtige Rolle in Ihren Beziehungen zu Ihrer engsten Familie?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
27. Spielt die deutsche Sprache eine wichtige Rolle in Ihren Beziehungen zu Ihren engsten Freunden?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
28. Wie wichtig ist das Erhalten der deutschen Sprache für Sie?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
29. Wenn Sie Kinder haben, verbessern Sie das Deutsch Ihrer Kinder?
 nie selten manchmal häufig regelmäßig
30. Wie wichtig ist es für Sie, dass Ihre Kinder die deutsche Sprache beherrschen können?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
31. Falls Ihre Kinder kein Deutsch sprechen oder verstehen, finden Sie das schade?
 gar nicht wenig ein bisschen ja keine Antwort
32. Wie wichtig ist die Beherrschung von anderen Sprachen für Sie?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig

33. Wie wichtig war es für Sie Sprachkenntnisse, außer Deutsch, zu haben, bevor Sie nach Südafrika kamen?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
34. Wie wichtig ist es für Sie, dass Ihre Kinder hohe Kenntnisse anderer Sprachen entwickeln?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
35. Wie wichtig war es für Sie, dass Ihre Kinder Sprachkenntnisse, außer Deutsch, hatten, bevor Sie nach Südafrika kamen?
 unwichtig relativ unwichtig nicht besonders wichtig wichtig sehr wichtig
36. Haben Sie je Ihr Herkunftsland besucht, seitdem Sie in Südafrika wohnen?
 Nie Selten 1-2 mal im Jahr 3-5 mal im Jahr mehr als 5 mal im Jahr
37. Sind Sie Mitglied eines Deutschen Clubs in Südafrika?
 Nein Ja
38. Wenn Sie mit Ja geantwortet haben, wie oft gehen Sie zu einem DeutschClub in Südafrika?
 nie selten manchmal häufig regelmäßig
39. Haben Sie Deukom?
 Nein Ja
40. Wenn Sie angegeben haben, dass Sie Deukom haben, wieviele Stunden am Tag schauen Sie Deutsches Fernsehen?
 weniger als 1 Stunde am Tag 1-2 Stunden am Tag 3-4 Stunden am Tag mehr als 5 Stunden am Tag
41. Kaufen Sie sich deutsche Bücher und Magazine in südafrikanischen Geschäften und bei den deutschen Buchhandlungen in Südafrika?
 Nie Ja, alle 6 Monate Ja, alle 3 Monate Ja, jeden Monat
42. Wie oft lesen Sie deutsche Bücher?
 nie selten manchmal häufig regelmäßig
43. Wie oft lesen Sie deutsche Zeitungen oder Magazine (z.B. im Internet)?
 nie selten manchmal häufig regelmäßig
44. Wie oft hören Sie deutsches Radio (z.B. im Internet od. durch Deukom)?
 nie selten manchmal häufig regelmäßig
45. Wie oft gehen Sie zu einem deutschen Gottesdienst?
 nie selten manchmal häufig regelmäßig
46. Wie oft kaufen Sie bei einem deutschen Bäcker oder Metzger ein?
 nie selten manchmal häufig regelmäßig
47. Falls Sie Kontakte mit Ihrem Herkunftsland erhalten, auf welche Weise tun Sie das meistens?
 e-mail Telefon Briefe Skype sms/ *what's app*, usw. Social Media (z.B. Facebook)
48. Welche Sprache(n) verwenden Sie meistens im Kontakt mit Ihrem Herkunftsland?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
49. Waren Sie auf einer deutschen Schule in Südafrika (oder in Ihrem Herkunftsland)?
 Nein Ja
50. Wenn Sie die Frage 49 mit *Ja* beantwortet haben, wieviele Jahre waren Sie an der Schule?
 1 Jahr oder weniger 1-2 Jahre 2-3 Jahre 3-4 Jahre 5 oder mehr Jahre
51. Was ist Ihr höchster Schulabschluss?
 Hauptschule Realschule Matrik Abitur Uni Berufsausbildung

52. Welche Sprache(n) haben Sie vor dem Schulbesuch gelernt?
 Deutsch Deutsch & Englisch Afrikaans andere.....
53. Haben Sie Sprachunterricht in Englisch gehabt, bevor Sie nach Südafrika gekommen sind (in der Schule oder anderswo)?
 nein ja, weniger als 1 Monat ja, weniger als 3 Monate ja, weniger als 6 Monate
 ja, weniger als 1 Jahr ja, mehr als 1 Jahr
54. Was war(en) Ihre Unterrichtssprache(n) in der Grundschule?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
55. Was war(en) Ihre Unterrichtssprache(n) in der Oberstufe?
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
56. Wie oft hatten Sie Deutschunterricht in der Woche?
 nie 1 Stunde in der Woche 2 Stunden in der Woche 3 Stunden in der Woche 4+ Stunden in der Woche
57. In dieser Sprache denke ich meistens
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
58. In dieser Sprache träume ich meistens
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
59. In dieser Sprache zähle und rechne ich meistens
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
60. In dieser Sprache bete ich
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
61. Diese Sprache beherrsche ich am besten
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
62. In dieser Sprache ist mein Wortschatz am größten
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
63. In dieser Sprache ist meine Aussprache am besten
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
64. In dieser Sprache kann ich Dialekte, Umgangssprache usw. am besten erkennen
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
65. In dieser Sprache habe ich ein Gefühl dafür, was sprachlich und grammatisch richtig und falsch ist.
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
66. In diese Sprache kann ich aus anderen Sprachen übersetzen
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)

67. In dieser Sprache kann ich Witze machen und verstehen
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
68. In dieser Sprache verwende ich Flüche/Schimpfwörter am häufigsten
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
69. Mit dieser Sprache/diesem Land/dieser Kultur identifiziere ich mich am meisten
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
70. In dieser Sprache halten andere Muttersprachler (Familie, Freunde, Kollegen) mich für einen Muttersprachler/eine Muttersprachlerin
 nur Deutsch; meistens Deutsch; Deutsch & andere Sprachen auf dem gleichen Niveau; meistens andere Sprachen (es sind.....); nur andere Sprachen (es sind.....)
71. Haben Sie abschliessend noch etwas, das Sie hinzufügen oder anmerken möchten, wozu Sie beim Ausfüllen des Fragebogens keine Gelegenheit hatten? Dies kann sowohl zu Ihrer persönlichen Situation als auch zu Ihrer Einstellung gegenüber der deutschen und gegenüber anderen Sprachen oder Kultur sein. Selbstverständlich können Sie auch den Fragebogen selbst kommentieren.

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VIELEN DANK FÜR IHRE TEILNAHME! ☺

B. Sociolinguistic and Background Questionnaire (English Translation)

QUESTIONNAIRE

First Name:

Date:

With this questionnaire I would like to get an impression of the personal background and language use of German emigrants in South Africa. It consists of 71 items. It is important to note that not all items may apply to you personally. **Should you think that a certain item does not apply to you (for example when you are asked about the language use of your children and you don't have any children), you may cross out the number in front of that particular question and move on to the next.** It is important that you answer these questions on your own, because I am interested in *your* language use. If you don't understand a certain question, please do not hesitate to ask me. There are no right or wrong answers!

Note: The information gathered through the questionnaire is confidential, will only be used for research purposes, and will not be disclosed to a third party.

1. What is your age?
2. Are you: male female
3. Where were you born: Village/Town:
4. What is your country of origin? DEU RSA ANDERE
5. When did you come to South Africa (year)?
6. How old were you when you came to South Africa?
7. Why did you emigrate and why to South Africa in particular?
 school uni work family marriage other
8. Apart from South Africa, have you ever lived in a country, other than your country of origin, for a longer period of time (that is, more than 6 months)?
 no
 less than 1 year, in: (country).....
 1 year or more, in: (country).....
9. Would you say that you spoke a standard German while you lived in your country of origin or a dialect?
 standard German a dialect, namely:
10. Which languages do you speak? (Please tick where appropriate)
 English
 Afrikaans
 German
 Other(s):
11. Which language(s) do you speak, how well do you speak them? Rate yourself using the following scale:
 1 = very poor; 2 = poor; 3 = fair; 4 = good; 5 = very good

Language:	Write										
	Read			Read			Read			Read	
	Speak			Speak			Speak			Speak	
	Hear			Hear			Hear			Hear	

12. How many hours per week do you use these languages? Please specify language and hours below.
 Language: _____ Language: _____ Language: _____
 Language: _____
13. What is your current profession?
14. What language(s) do you use in your profession?
 German German & English Other.....
15. What language do you mostly use with your friends?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
16. If partner, what language do you speak to your partner?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)

17. What language does your partner speak to you?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
18. What language do you speak to your (frequent contact) closest relatives?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
19. What language do you closest relatives speak to you?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
20. Do you think German plays an important role in the relationship between your direct family members?
 not at all not much probably a bit very much
21. In South Africa, do you have more South African or German acquaintances?
 only SA; mostly SA; SA and GER equally; mostly GER; only GER
22. In which language do you feel at home?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
23. Do you feel more at home in the German or in the South African culture?
 only SA; mostly SA; SA and GER equally; mostly GER; only GER
24. Which language has the most emotional significance for you?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
25. Which language do you identify most with?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
26. Do you feel that German plays an important role in the relationship with your direct family?
 unimportant; relatively unimportant; not very important; important; very important
27. Do you feel that German plays an important role in the relationship with your closest friends?
 unimportant; relatively unimportant; not very important; important; very important
28. How important is maintaining your German to you?
 unimportant; relatively unimportant; not very important; important; very important
29. If you have children, did /do you ever correct your children's German?
 never very rarely sometimes regularly very often
30. Do/would you consider it important that your children are proficient in German?
 unimportant; relatively unimportant; not very important; important ; very important
31. If your children do not speak or understand German, do you regret that?
 not at all not much a bit very much no answer
32. Other than German, how important is being proficient in other languages to you?
 unimportant; relatively unimportant; not very important; important; very important
33. How important was it for you to have other language skills/ knowledge before your arrival in South Africa?
 unimportant; relatively unimportant; not very important; important; very important

34. If you have children, did/do you consider it important that your children develop high skills in other languages?
unimportant; relatively unimportant; not very important; important; very important
35. How important was/is it to you for your children to have other language skills/ knowledge before your arrival in South Africa?
unimportant; relatively unimportant; not very important; important; very important
36. Have you ever been back to Germany since living in South Africa?
 never; seldom; 1-2 times a year; 3-5 times a year; over 5 times a year
37. Are you a member of a Germanclub?
 No Yes
38. If you answered 'yes' in question 37, how often do you attend a German social club?
never; rarely; sometimes; often; very often
39. Do you have Deukom at home?
 No Yes
40. If you have Deukom at home, how many hours a day do you watch (German) TV?
 less than 1 hour; 1-2 hours; 3-4 hours; more than 5 hours
41. Do you buy German books or magazines in the local store(s) and at the German bookstore?
 Never; Yes, every 6 months; Yes, every 3 months; Yes, every month
42. How often do you read German books?
never; rarely; sometimes; often; very often
43. How often do you read German newspapers/magazines?
never; rarely; sometimes ; often ; very often
44. How often do you listen to German radio/programs)?
never; rarely; sometimes ; often ; very often
45. How often do you attend a German church service?
never; rarely; sometimes ; often ; very often
46. How often do you shop at a German butchery or bakery?
never; rarely; sometimes ; often ; very often
47. How do you keep in touch with those relatives and friends in Germany?
 e-mail telephone letters skype sms/*what's app*, etc. social media (ex. facebook)
48. What language or languages do you mostly use to keep in touch with relatives and friends in your country of origin?
only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
49. Did you attend a German School in South Africa (or in your country of origin)?
 yes no
50. If you answered 'yes' in question 49, how many years did you attend the school?
 5 or more years 3-4 years 2-3 years 1-2 years 1 year or less
51. What is the highest level of education you have completed?
 Realschule Matrik Abitur Ausbildung Uni
- 51.1 Did you attend a university in Germany?
 Yes No

52. What language(s) did you acquire before starting school? (i.e. pre-school/ at home)
 German English German & English Afrikaans Other(s).....
53. Did you attend any English classes before coming to South Africa? (this has to be in an educational environment, like a school or some similar institution):
 no; yes, less than 3 months; yes, less than 6 months; yes, less 1 year; yes, more than 1 year
54. Which was/were the language(s) of instruction in primary school?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
55. Which was/were the language(s) of instruction in secondary school?
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
56. How often did you have German lessons a week (in school)?
 None; 1 hour a week; 2 hours a week; 3 hours a week; 4 or more hours a week;
57. Language in which you think most often
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
58. Language in which you dream most often
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
59. Language in which you count / do maths
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
60. Language in which you pray
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
61. Dominant language (i.e. language you are "best" at)
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
62. Language in which you have the largest vocabulary
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
63. Language in which you have no pronunciation problems
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
64. Language which you are able to understand / use intuitively
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
65. Language in which you are familiar with various dialects, slang
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)
66. Language in which you have an intuitive feeling what is "correct" and "incorrect"
 only German; mainly German; German & other language(s) to same degree;
 mainly other language(s) (which is); only other language(s) (which is)

67. Language into which you are able to translate

- only German; mainly German; German & other language(s) to same degree;
- mainly other language(s) (which is); only other language(s) (which is)

68. Language in which you can understand and make jokes

- only German; mainly German; German & other language(s) to same degree;
- mainly other language(s) (which is); only other language(s) (which is)

69. Language in which you swear most often

- only German; mainly German; German & other language(s) to same degree;
- mainly other language(s) (which is); only other language(s) (which is)

70. Language of which other speakers consider you a native speaker

- only German; mainly German; German & other language(s) to same degree;
- mainly other language(s) (which is); only other language(s) (which is)

71. You have come to the end of this questionnaire. Is there anything you would like to add? This can be anything from language-related comments to remarks about the questionnaire or research itself.

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THANK YOU FOR YOUR PARTICIPATION! ☺

Appendix B

1. C-test (German Version)

(Taken from: www.let.rug.nl/languageattrition/experiments)

Lückentexte ausfüllen

Auf den folgenden Seiten finden Sie jeweils vier kurze deutsche Texte. Diese Texte sind lückenhaft, wobei keine ganzen Wörter fehlen, sondern jeweils ein Teil von einem Wort. Versuchen Sie bitte, aus dem Textzusammenhang abzuleiten, wie die Leerstellen eingefüllt werden müssen. In vielen Fällen gibt es hier keine richtige oder falsche Antwort, weil oft mehrere Möglichkeiten bestehen.

Sie haben hierfür 10 min. Zeit!

Name:

Datum:

Text 1:

Die Geschichte der Kernspaltung reicht zurück in das frühe 19. Jahrhundert. In

d_____ Folgejahren leg_____ Chemiker d_____ Grundstein f_____ den mode_____ Atombegriff. S_____ erkannten, da_____ die chemi_____ Elemente a_____ Teilchen aufg_____ sind, d_____ untereinander völ_____ gleichartig reag_____, sich jed_____ von and_____ Elementen unters_____. 1871 erschien d_____ erste tabell_____ Aufstellung d_____ Eigenschaften al_____ bekannten Elem_____, das Periode_____.

Text 2:

Eine Wünschelrute ist ein gegabelter Zweig, ursprünglich meist vom

Haselnussstrauch, später verwe_____ man au_____ ähnliche Instr_____ aus untersch_____ Materialien. S_____ dient d_____ so gena_____ Rutengänger, ei_____ Person, d_____ für si_____ eine beso_____ Begabung bean_____, als Hilfs_____ zum Auff_____ von unterir_____ »Reizzonen«, z_____ Beispiel Wasse_____, Erdölvorkommen od_____ Erzlagerstätten.

Text 3:

Sicherheitshinweise

Bedienungsanleitung bitte vollständig vor Inbetriebnahme des Bügeleisens durchlesen und aufbewahren. Reparaturen an Elektro_____ dürfen n_____ von Fachk_____ durchgeführt wer_____. Durch unsach_____ Reparaturen kön_____ erhebliche Gefa_____ für d_____ Benutzer entst_____. Wird d_____ Gerät zwecken_____ oder fal_____ bedient, ka_____ keine Haf_____ für dad_____ verursachte Sch_____ übernommen wer_____. Das Ge_____ wurde v_____ uns sicherheitstechnisch geprüft.

Text 4:

Schon in ältester Zeit haben die Menschen den Himmel beobachtet. Je stärker frühe Kult_____ von d_____ Natur abhä_____ waren, desto näher l_____ es f_____ sie, a_____ den o_____ periodischen Ersche_____ der Na_____ und d_____ Sternenhimmels besti_____ Faktoren abzul_____, die i_____ tägliches Le_____ beeinflussten. Im Verlauf d_____ Entwicklung d_____ mensch_____ Zivilisation verl_____ diese natur_____ Zyklen im_____ mehr a_____ Bedeutung.

2. Answers to C-test (German Version)

Text 1:

Die Geschichte der Kernspaltung reicht zurück in das frühe 19. Jahrhundert. In den Folgejahren legten Chemiker den Grundstein für den modernen Atombegriff. Sie erkannten, dass die chemischen Elemente aus Teilchen aufgebaut sind, die untereinander völlig gleichartig reagieren, sich jedoch von anderen Elementen unterscheiden. 1871 erschien die erste tabellarische Aufstellung der Eigenschaften aller bekannten Elemente, das Periodensystem.

Text 2:

Eine Wünschelrute ist ein gegabelter Zweig, ursprünglich meist vom Haselnussstrauch, später verwendete man auch ähnliche Instrumente aus unterschiedlichen Materialien. Sie dient dem so genannten Rutengänger, einer Person, die für sich eine besondere Begabung beansprucht, als Hilfsmittel zum Auffinden von unterirdischen »Reizzonen«, zum Beispiel Wasseradern, Erdölvorkommen oder Erzlagerstätten.

Text 3:

Bedienungsanleitung bitte vollständig vor Inbetriebnahme des Bügeleisens durchlesen und aufbewahren. Reparaturen an Elektrogeräten dürfen nur von Fachkräften durchgeführt werden. Durch unsachgemäße Reparaturen können erhebliche Gefahren für den Benutzer entstehen. Wird das Gerät zweckentfremdet oder falsch bedient, kann keine Haftung für dadurch verursachte Schäden übernommen werden. Das Gerät wurde von uns sicherheitsgechnisch geprüft.

Text 4:

Schon in ältester Zeit haben die Menschen den Himmel beobachtet. Je stärker frühe Kulturen von der Natur abhängig waren, desto näher lag es für sie, aus den oft periodischen Erscheinungen der Natur und des Sternenhimmels bestimmende Faktoren abzuleiten, die ihr tägliches Leben beeinflussten. Im Verlauf der Entwicklung der menschlichen Zivilisation verloren diese natürlichen Zyklen immer mehr an Bedeutung.

3. C-test instruction (English translation)

Fill in the gap

The following pages you will find four short German texts. Each text contains gaps where parts of some words have been left out (no whole words are missing, though). Please try and fill in the gaps. In many cases there are several possibilities, so there are no right or wrong answers.

Appendix C

1. Instructions to the Verbal Fluency Task (German Version)

“Ich werde eine Kategorie nennen und ich möchte das Sie in 60 Sekunden so viele Wörter wie möglich sagen, die zu dieser Kategorie gehören.

Wenn ich zum Beispiel „Möbel“ sage, könnten Sie „Sofa, Schrank, Tisch, usw.“ sagen

Haben Sie Fragen?

Die Kategorie ist:

2. Instructions to the Verbal Fluency Task (English Translation)

“I will be giving you a category and I would like for you to name as many items pertaining to that category within 60 seconds.

For example, the category “furniture”: here you can list the items such as couch, cupboard, table, etc.

Do you have any questions?

The category is:

Appendix D

1. Instructions for the Picture Naming Task (German Version)

“Ich werde Sie bitten einige Bilder zu nennen. Wenn Sie einen Signalton hören wird ein Bild auf dem Computerbildschirm erscheinen.

Ihre Aufgabe ist es, das Bild so schnell wie möglich zu nennen. Bitte verwenden Sie nur ein Wort.

Zwischen jedem Bild wird ein (*) erscheinen. Dieses bedeutet eine kurze Pause.

Wir werden mehrere Bilder üben, bevor wir Anfangen.“

2. Instructions for the Picture naming Task (English Translation)

“I will be asking you name a few images. You will hear a ‘peep’ when the image appears on the computer screen.

You task is to name the image as quickly as possible, using only one word.

Between each images a (*) will appear which indicates a quick pause.

We will first practice a few images.

Appendix E

1. Picture Naming Task items and their response rate (/22)

<u>Item</u>	<u>Response Rate</u>
Baum	22
Kugelschreiber	21
Schere	22
Thermometer	20
Brunnen	19
Weintrauben	22
Brot	22
Schwein	22
Gabel	22
Wasserfall	22
König	22
Würfel	20
Truthan	15
Harke	19
Kamin	22
Schädel	19
Bügeleisen	22
Matrosse	18
Schal	22
Taschenlampe	19
Rucksack	21
Papiertüte	22
Fledermaus	22
Badewanne	22
Käfer	18
Vogel	22
Boot	22
Besen	22
Kassette	20
Kamm	22
Wiege	9
Zahnarzt	22
Bohrer	22
Elefant	22
Ventilator	12
Feder	22
Gespennst	20
Glass	22
Nashorn	19
Eichel	16
Iglu	22
Stelzen	17
Dominosteine	17

<u>Item</u>	<u>Response Time</u>
Kaktus	22
Rolltreppe	22
Harfe	21
Hängematte	20
Türklopfer	9
Handschellen	16
Drachen	19
breifkasten	14
Krankenschwester	20
Buroklammer	11
Sparschwein	21
Heugabel	10
Razierer	19
Sicherheitsnadel	19
Pelikan	18
Stethoskop	14
Pyramide	22
Maulkorp	11
Einhorn	20
Trichter	18
Ziehharmonika	20
Schlinge	7
Spargel	17
Zirkel	14
Steinschleuder	12
Wippe	15
Schlips	22
Pokal	20
Pinzette	22
Staubsauger	20
Portmonnaie	21
Waschmaschine	22
Joch	1
Ranke	1
Farbpalette	8
Winkelmesser	4
Abakuss	7

Appendix F

1. Consent form (German Version)

Einverständniserklärung – Teilnehmer/ Teilnehmerin

Die Universitätsrichtlinien verlangen, dass alle am Test teilnehmenden Personen ihr formelles Einverständnis erklären müssen, bevor sie an diesem Forschungstests teilnehmen können. Deshalb möchte ich Sie bitten, die folgende Einverständniserklärung zu unterschreiben und zu datieren.

Einverständnis zur Verwendung von:

- Fragebogeninformationen
- Testergebnissen der Tests 1, 2 und 3

Ich habe die Teilnehmerinformation zu dieser Studie gelesen und hatte die Gelegenheit, Fragen zu stellen. Ich erkläre mich zur Teilnahme bereit. Ich habe verstanden, dass alle Daten vertraulich behandelt werden und meine Identität im Forschungsbericht bzw. in eventuellen Veröffentlichungen anonymisiert wird. Ich wurde auch darüber informiert, dass die in diesem Projekt gesammelten Daten nur zu wissenschaftliche Zwecken verwendet werden.

Ich verstehe, dass meine Teilnahme freiwillig ist und ich meine Teilnahme jederzeit beenden kann.

Name der Testperson:

Name der Forscherin: Simone Gültzow

Unterschrift (Teilnehmer / Teilnehmerin):

Unterschrift (Forscherin):

Datum:

Datum:

2. Consent Form (English Translation)

Participant Consent Form

It is a university requirement that all respondents give their formal consent to take part in any research. For this reason could you please sign and date the declaration below.

Consent to the use of

- Questionnaire information
- Test results of tests 1, 2 and 3.

I have read the statement provided for the above research project and I have had the opportunity to ask questions. I consent to participate in this research project. I understand that all the data will be kept confidential and I will be anonymous in the research report. I also know that the data gathered from this project will exclusively be used for scientific purposes.

Participation is voluntary withdrawal from this project is possible at any time.

Signed (participant):

Name:

Date:

Signed (researcher):

Name: Simone Gültzow

Date:

