The impact of degree of bilingualism on L3 development

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English language development
in early and later bilinguals in the Frisian context

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Chapter 1 - Introduction

Several studies in the last decades have shown that bilinguals are good third language (L3) learners (e.g. Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Brohy, 2001; Safont, 2005). This dissertation studies whether this claim also holds for bilingual speakers of two very closely related languages - Frisian and Dutch - that learn an also closely related L3, English. What makes the Frisian context special is that history claims that Frisian and English have a special relationship because they derive from a common ancestor, Anglo-Frisian. This common ancestor has led to a common belief that Frisians are good English language learners. But are they really? What, besides being bilingual, influences successful L3 development? This dissertation addresses these questions and seeks to find out what influences L3 development in a broad sense, from internal to external processes, from language and motivation towards language learning to the actual language proficiency and underlying processes in terms of lexical access. It provides insight in what influences (successful) L3 development which can guide educators and education policy makers offering English as a L3 in minority language areas.

This dissertation is set in the province of Fryslân, in the north of the Netherlands, where the minority language Frisian is spoken besides the main language Dutch. It studies the impact of the degree of bilingualism in L1 and L2 on L3 development in three closely related West-Germanic languages: Frisian, Dutch and English. In this dissertation, degree of bilingualism in L1 and L2 is categorically defined by a differentiation between early Frisian-Dutch bilinguals (EB) and later Dutch-Frisian bilinguals (LB). The classification of whether a participant belonged to the EB or LB group was based on what the participants themselves, their parents and their teachers indicated as their main mother tongue, the language they used most at home and by a question on when and where they had learned the language. EB are participants with L1 Frisian and L2 Dutch who have simultaneously acquired both languages from birth at home. LB are participants with L1 Dutch and L2 Frisian who have sequentially acquired Dutch at home from birth and Frisian at school from an average age of 7.2 years. The main research question addressed is:

> Does degree of bilingualism impact third language development in three closely related West-Germanic languages: Frisian, Dutch and English?

The dissertation concentrates on three intertwining points of focus: socio-psychological factors, oral language proficiency and lexical access. By looking at these focus points the process of language development is studied broadly: from language background and motivation to learn languages till the actual language proficiency and lexical processes. It is also done to measure the influence of one point focus on the other, for example the influence of language contact on oral language proficiency and lexical processing. Furthermore, the development over time is included to study how socio-psychological factors, oral language proficiency and lexical access change in one school year. Each of the three points of focus, has its own research questions which are presented at the end of chapter 2. Before the background of the three focus points is discussed in chapter 2, the remainder of the current chapter provides more information about the three languages and language education in the province of Fryslân.

1.1 Bilingual province of Fryslân

The province of Fryslân is a bilingual region in the north of the Netherlands. The province has two official languages: Dutch, the national language and Frisian, the minority language. Frisian is also spoken in parts of Germany but in the present dissertation by Frisian the variety West Frisian as spoken in the Netherlands is meant. In 2015, 55% of the 646.000 inhabitants of Fryslân had Frisian as their mother tongue whilst 30% have Dutch and 15% another language as their mother tongue (Province of Fryslân, 2015). Since Dutch is the main dominant language, every inhabitant of Fryslân speaks Dutch as well. English is the most popular foreign language, sometimes even called the third language of Fryslân. Frisian is mostly spoken in the rural areas and to a much lesser extent in the urban areas where Dutch or dialects such as Liwwadders or Bildtsk (Province of Fryslân, 2015). This dissertation focuses on young adolescent Frisians. For this group, the Statline website of the Central Bureau for Statistics (2017) reveals that in the school year 2012/2013 there were 12.972 12 and 13 year olds following the first years of secondary education in Fryslân, which makes up 2.01% of the total number of inhabitants. How many of those have Frisian as their L1 is not clear but is probably in line with the 55% mentioned above.

Since a few decades Fryslân has been recognised as a bilingual province by the Dutch Government. In 2014 the Frisian language was officially recognised as the second official language in the province of Fryslân. Frisian was also given its own language law, which gives inhabitants of the province the right to use the language in court or in contact with governing bodies. Dutch is however still the dominant language used in schools, politics and media whereas Frisian is more restricted to

the domains of home, neighbourhood and family and friends (Oosterloo & Paus, 2005). Although in primary education, depending on the area, Frisian is used as a language of instruction - mostly in the lower grades, Dutch is still the most dominant language of instruction in secondary education. Frisian schools use Dutch to teach literacy skills and it is therefore the dominant language used for reading and writing. Since Frisian is mainly a spoken language and the focus in education is on Dutch literacy skills, literacy skills in Frisian are generally very low. The Province of Fryslân has been measuring Frisian language skills in the province every 4 years since 2007. The self-reported levels for understanding, speaking, reading and writing Frisian as measured in 2015 were 85.1%, 66.6%, 51.8% and 14.5% respectively (Province of Fryslân, 2015). The surveys from 2007, 2011 and 2015 show that these numbers on mother tongue speakers of Frisian and their self-reported Frisian language skills stay rather stable. However, since these are self-reported percentages they do have to be taken with caution.

1.2 Three closely related languages

This dissertation deals with three closely related languages: Frisian, Dutch and English. All three languages are West-Germanic languages. As figure 1 shows this branch of languages developed into three groups; Ingvaeonic, from which English, Frisian and Low German derive, Istvaeonic, from which Dutch and Afrikaans derive and Erminonic from which German and Yiddish derive. These names refer to three major tribal groups in which, according to Tacitus, the Germanic peoples were divided and serve to mark out some important geographical distributions that correspond to these dialect groups (Lass, 1994).

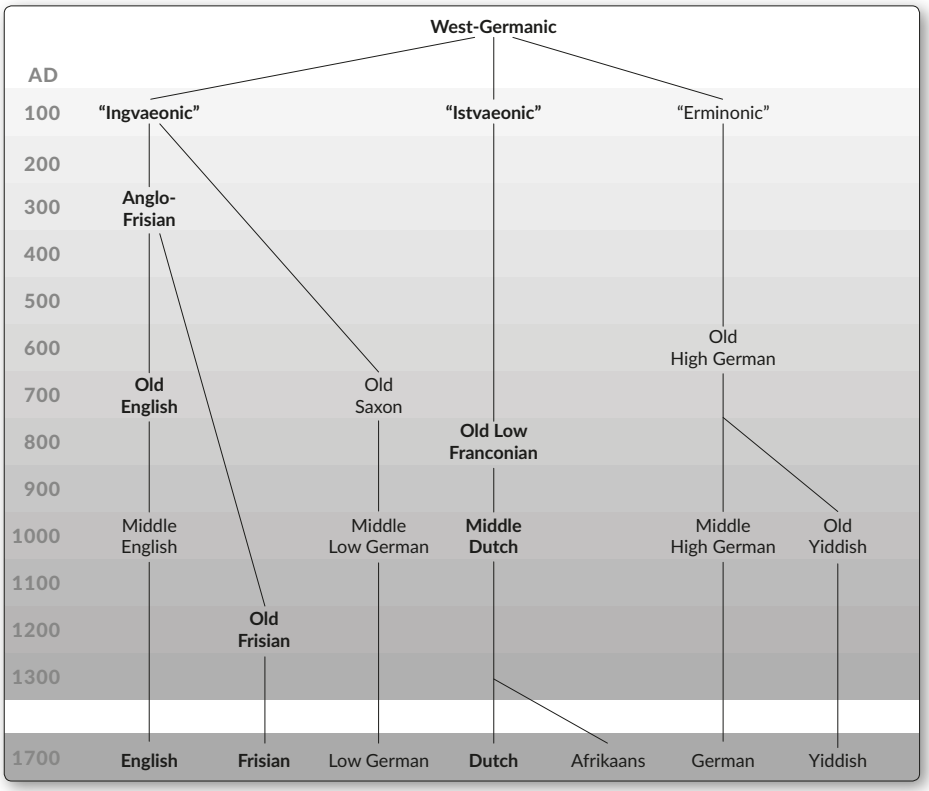


Figure 1. The West Germanic family tree. Shortened version from: Lass (1994, p. 15).

The Frisians are said to have brought their language with them when in the 5th century, the time of the Great Migration, they invaded Britain together with the Jutes, Angles and Saxons (Harvey, 2002), as is shown by figure 2. They expelled the original Celtic inhabitants and founded their own kingdoms. Old English that was spoken in the area around 1100 shared a lot of similarities with Old Frisian and the different tribes were able to mutually understand each other. The fisherman in East Anglia even had a rhyme about the relationship between Frisian and English: "Bread, butter and green cheese is good English and good Friese".

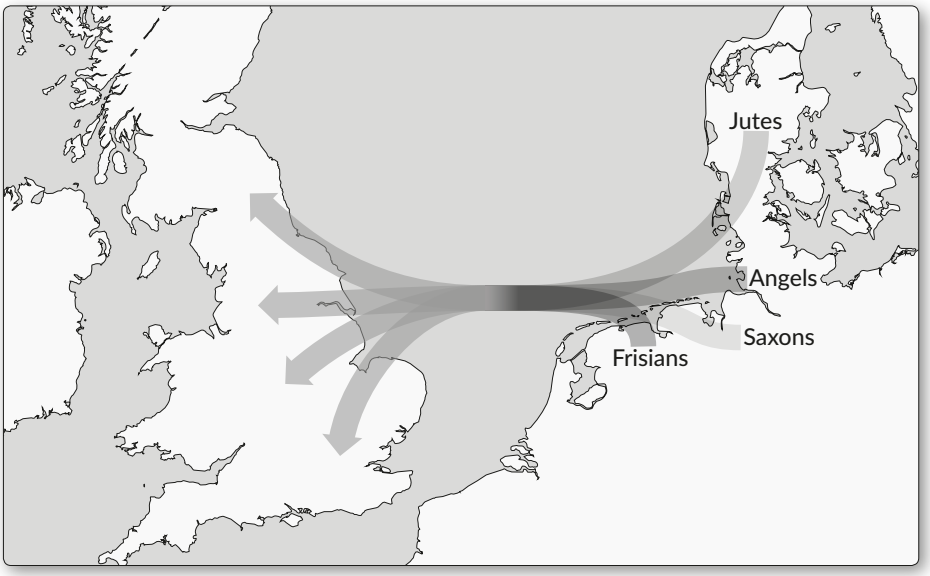


Figure 2. Angle, Saxon, Jutish and Frisian invasions. Based on: Culpeper (1997, p. 3).

Because Old English and Old Frisian share many characteristics it has been suggested that the languages in the Ingvaenoic group derive from a common ancestor, Anglo-Frisian. However, historical linguists' opinions differ on whether Anglo-Frisian has existed. Still, there are similarities between the two languages that go a long way back. Both language share 'coastal features' due to the geographical position of the speakers of both languages (Lass, 1997). Because of this position, Frisian and English underwent different sound changes than Dutch and were not influenced by the second German sound shift between the 5th and 8th century. Table 1 provides an overview of some of these changes.

Table 1. Overview phonological similarities and differences between Frisian, Dutch and English.

Frisian	Dutch	English
kaai [ka:i]	sleutel [ˈsløtəl]	key [ki:]
tsiis [tsi:s]	kaas [kas]	cheese [ʧi:z]
troch [trox]	door [do:r]	through [θru:]
brea [brɪə]	brood [brot]	bread [bred]
goes [guəs] [gʊos]	gans [ɣɑns]	goose [gu:s]
dei [dai] [da.i] [dɛi] [dɔi]	dag [dɑx]	day [deɪ]

From: van der Meij (2003, p. 15)

For example, the English word 'cheese' and the Frisian word 'tsiis' which both start with a /tʃ/ sound as opposed to a /k/ in Dutch 'kaas'. This feature, which according to Harvey (2002) Frisian has carried a step further than English, is the assibilation of velars before front vowels. Robinson (1992) explains that in both English and Frisian the original /k/ has in many instances been palatalised to a sound like /tʃ/. Other examples of this are for example English 'church' and Frisian 'tsjerke' as opposed to Dutch 'kerk'. It is not in the scope of this dissertation to discuss all details of the differences in sound changes between Frisian and English on the one hand and Dutch on the other hand but Robinson (1992) and Harvey (2002) provide good overviews of it.

Besides the sound shifts, there are also other factors influencing how Frisian, English and Dutch developed. Frisian was heavily influenced by the Dutch language whereas English was influenced by the French language. Yet, there are many similarities between the three languages today in particular at the lexical level. Table 2 shows some examples of cognates that are shared between the languages.

Table 2. Frisian, Dutch and English cognates.

Frisian	Dutch	English
appel [ˈɑpəl]	appel [ˈɑpəl]	apple [ˈæpəl]
roas [roəs]	roos [ros]	rose [roʊz]
stof [stɔf]	stof [stɔf]	dust [dʌst]
keamer [ˈkɪəmər]	kamer [ˈkamər]	room [ruːm]
kaai [kaːi̯]	sleutel [ˈsløtəl]	key [kiː]
bolle [ˈbolə]	stier [stiːr]	bull [bʊl]
tsjil [(t)sjɪl]	wiel [ʋil]	wheel [wiːl]
heit [hɛi̯t] [hai̯t] [hɔi̯t]	vader [ˈʋadər]	father [ˈfɑːðə] [ˈfɑðər]

This similarity can influence (L3) language learning, as will be discussed in section 2.1.

1.3 Language in education in Fryslân

As mentioned in section 1.1, Dutch is the dominant language used in schools and Frisian is more restricted to the domains of home, neighbourhood and family and friends (Oosterloo & Paus, 2005). However, there have been early attempts to get more Frisian into education. It was made a compulsory subject in primary school in 1980 and in secondary education in 1993 after it had been an optional subject from 1948 on. Bilingual and trilingual primary education is very common in Fryslân, but until recently not so much in secondary education. Nowadays there are several secondary schools that offer bilingual Dutch-English programs and some schools have started trilingual Frisian-Dutch-English programs.

1.3.1 Language exposure at school

A growing number of preschools and day cares in the province of Fryslân are bilingual (Inspectie van het Onderwijs, 2010). At primary school Frisian is a subject in every grade from grade 3/4 onwards, on average taught for half an hour to an hour per week. The main attainment target is learning to speak: Frisian is mainly on the programme for its social function in society (Ministerie van OCW, 2006). Little attention is paid to learning to read and write Frisian. At some primary schools Frisian is the language of instruction as well, especially in the lower grades. A still growing number of schools offer bilingual (Frisian-Dutch) or even trilingual (Frisian-Dutch-English) education (Province of Fryslân, 2015). Officially secondary schools have to offer Frisian as a compulsory subject for year 1 and 2 for one hour per week. However, many schools only teach Frisian in year 1. Schools can ask for an exemption if for example they are located in urban areas where Frisian is almost not spoken. The attainment targets for Frisian are different to those for Dutch, although they cover the same domains. The attainment targets for Frisian are differentiated for L1 and L2 speakers of Frisian (SLO, 2016). Higher attainment targets are set for L1 speakers of Frisian. However, The Dutch Inspectorate of Education concluded that in practice not enough differentiation between L1 and L2 speakers of Frisian is made (Inspectie van het Onderwijs, 2010). The Inspectorate also concluded that too little attention is paid to reaching the Frisian attainment targets (Inspectie van het Onderwijs, 2010). Although the legal possibility to use Frisian as a language of instruction during lessons of other subjects is available, only 15% to 40% of the regular (monolingual) secondary schools, use Frisian on an occasional basis for instruction in other subjects than Frisian (Inspectie van het Onderwijs, 2010). The percentage that Frisian is used depends on the subject. Frisian is mostly used during Physical Education and Human and Nature lessons and least in English and Maths lessons (Inspectie van het Onderwijs, 2010). For a long time there was a lack of Frisian teaching materials for secondary education. However the development of Frisian teaching materials for secondary education has known a boost, first with the introduction of *Freemwurk* in 2006 and from 2014 onwards with an online platform *Searje 36* that contains texts and videos but also vocabulary games and can be used on a range of devices. Both were created by the Afûk foundation, which develops Frisian teaching materials, in cooperation with the Frisian school counselling service Cedin and Frisian language teachers. According to the Afûk (personal communication, January 24, 2018) in the school year 2017/2018 3862 pupils in Fryslân from 37 school locations (out of 75) had a license to use *Searje 36*.

Even though Frisian is one of the two official languages of Fryslân, language exposure at school is mainly Dutch. Since Dutch is the dominant language, both primary and secondary schools have to follow strict attainment targets. Attainment targets aim at full use and understanding of the Dutch language for all four skills (listening, speaking, reading and writing). At primary level, Dutch as a subject is taught about 7-8 hours per week. At secondary level Dutch as a subject is taught for approximately 3 hours per week in all grades. Dutch is also the language of instruction in almost all subjects, except for the bilingual (Dutch-English) and trilingual (Frisian-Dutch-English) schools.

Just as in the other provinces of the Netherlands, English has been a compulsory subject in primary education from 1986 onwards in Fryslân. At primary school English is mostly taught in grades 7 and 8 (ages 10-12) for one lesson per week. English is almost always taught as a subject only and not used as a language of instruction. As mentioned earlier, there is a still rising trend for trilingual education (Frisian, Dutch and English) where English is used as a language of instruction for approximately 20% of the teaching time (Inspectie van het Onderwijs, 2010). 15% of the 445 primary schools are now officially registered in the Network of Trilingual Schools. The attainment targets for English for primary school pupils are limited to simple oral communication, listening and speaking and being able to read simple texts. At secondary school English is taught at all levels and in all years for 2 to 4 hours a week. In most cases, the English language is only taught as a subject and not used as a language of instruction, although more bilingual Dutch-English and trilingual Frisian-Dutch-English programs are coming up. 5 out of the 75 Frisian secondary schools now offer a trilingual program. The main goal of the English lessons is to learn to communicate in English and the emphasis lies on English as a world language. Most of the 8 attainment targets that have been designed for the English lessons are related to the Common European Framework of Reference for Languages (CEFR). The CEFR is divided into 6 levels (A1-A2-B1-B2-C1-C2), running from a beginner's level (A1) to a near-native level (C2). Depending on the level of education, by the end of secondary school pupils should reach between level A1 and B1 of the CEFR (SLO, 2016). These are mainly aimed at productive and receptive language skills.

1.3.2 Language exposure outside school

Frisian is seen as an informal language, used mostly in social contexts like at home, in the neighbourhood, with friends and family (Oosterloo & Paus, 2005). On social media Frisian is used by 56% of Frisian teenagers (Jongbloed-Faber, Van de Velde, van der Meer & Klinkenberg, 2016) but these are mostly Frisian L1 speakers. Dutch

is however the preferred language on social media by Frisian teenagers (Jongbloed-Faber et al., 2016). In domains like the church, media and politics there is a mix of languages. There are some (completely) Frisian newspapers and there is a Frisian broadcaster for radio and television but these might not always appeal to Frisian young adolescents. The assumption is that they will mostly watch, listen to and read Dutch and English rather than Frisian outside school. The exposure to Dutch is big through television and the Internet. The exposure to English is large in general. According to Arocena Egaña, Douwes and Hanenburg (2010, p. 40) "there is a substantial amount of English language input in everyday life" outside the school in Fryslân. The main source of English language exposure seems to be television and social media channels, where all English programmes use the original language of the programme together with Dutch subtitling. Since a lot of the programmes that are broadcasted in Fryslân, just as in the other provinces of the Netherlands, are from the United States of America or the United Kingdom, viewers are exposed to a lot of English (Arocena Egaña et al., 2010). Arocena Egaña et al. (2010) also mention computer games, the Internet and signs and advertisements in the streets as sources of English language exposure in Fryslân. This last feature is referred to as the *Linguistic Landscape*, which refers to mostly written, although it could also be spoken, signs in public space in an area. For example, road signs, billboards, street and place names, commercial shop signs and public signs on for example government buildings (Landry & Bourhis, 1997). Although in Fryslân place name signs are bilingual (e.g. the capital city is named Dutch *Leeuwarden* and Frisian *Ljouwert*) the percentage of other bilingual Frisian-Dutch signs is very low. The dominant language in the Linguistic Landscape is Dutch followed by English (Bierma, 2008; Edelman, 2010). This has several reasons, one of which is that international chains prefer to use Dutch and English in their written communication. Frisian is only used by a few establishments, those that are independent establishments or belong to regional chains (Bierma, 2008; Edelman, 2010). Besides that, interviews with the managers of the establishments in one Frisian town conducted by Bierma (2010) revealed that the managers feel that Dutch is the best language to use in written communication since the percentage of people that can read Frisian is very low. Furthermore, the establishments' managers feel that public opinion towards Frisian is negative and they do not want to put off potential customers. Finally, they feel that the writing on the signs should be big, short and straightforward and adding an extra language takes up too much space.

1.3.3 Summary

What the preceding description of the linguistic situation in Fryslân has shown is that the Frisian context is a unique context to develop English as an L3. First of all, there is the close relationship between Frisian, Dutch and English in general and especially between Frisian and English. Secondly, although Frisian is the official second language of the province of Fryslân, Dutch is the dominant language and English has a very prominent place as well. The question is, however, whether the exposure to the different languages is the same for EB and LB. Naturally, EB are more exposed to Frisian at home, could this also influence how much they are exposed to Dutch and English? Besides that, what is the influence of using Frisian or Dutch at home on language attitudes and motivation towards other languages? Are these seen as a threat or an opportunity? Using the Frisian context as a research setting provides an excellent opportunity to study what the impact of the degree of bilingualism is and what other factors possibly play a role in the development of English as a third language.

1.4 Thesis outline

Chapter 2 provides the theoretical background of the dissertation providing more information on the chosen points of focus that this dissertation was based on: socio-psychological factors, oral language proficiency and lexical access. The chapter concludes with the research question for each of the three points of focus.

Chapter 3 discusses the methodological set-up of the dissertation. It provides background information on the participants as well as research procedures, the different research instruments that were used and the statistical analyses that were performed.

Chapters 4, 5 and 6 discuss the different tests and experiments that were conducted in the dissertation. Chapter 4 describes the results of background questionnaires that were used to see whether EB and LB differ in the amount of language contact and in language learning attitudes and motivation. Chapter 5 discusses the results of a questionnaire on self-assessment of language proficiency, an English vocabulary test and results of oral language proficiency tasks in the three languages that were used to describe possible differences between EB and LB in oral language proficiency. Chapter 6 discusses the results of a Lexical Decision Task and a Word Naming Task that were used to study participants' lexical access in word recognition, again by comparing EB and LB.

Chapter 7 provides a reflection and discussion on the findings from all the different tests and experiments combined. It concludes by drawing conclusions on the whole dissertation and provides recommendations for possible future research.

Chapter 2 - Theoretical background

As was mentioned in chapter 1, this dissertation looks at the impact of degree of bilingualism on L3 development from three focus points: socio-psychological factors, oral language proficiency and lexical access and takes development over time into account. The aim of the current chapter is to provide information on the theoretical background of the dissertation. It starts with an overview of the existing literature of factors that influence third language development and then discusses each of the three chosen focus points followed by a discussion on the influence of development over time.

2.1 Studies on trilingualism

Studies on bilingualism have been carried out for decades but studies on trilingualism have only gained more attention in the last 20 years. Trilingualism has been studied from different perspectives. Some involved the effect of bilingualism on (an aspect of) L3 proficiency (Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Brohy, 2001; Safont, 2005). Others looked into the positive effects of trilingualism on cognitive development (Cenoz, 2013; Schroeder & Marian, 2016). Yet others have looked at the influence of contextual factors on trilingualism such as trilingual families (De Houwer, 2004; Chevalier, 2008) or into trilingualism and meta-linguistic awareness (Jessner, 2006). Cross-linguistic influences is another area that a lot of trilingual studies focussed on (Cenoz, 2001, 2003b; Murphy, 2003; De Angelis, 2005). Finally, some studies looked at psycholinguistic aspects of trilingualism such as language control (Costa & Santesteban, 2004) and word-recognition (van Hell & Dijkstra, 2002; Lemhöfer, Dijkstra & Michel, 2004). Many studies showed positive results on advantages for early or high-proficient bilinguals compared to monolinguals and later or beginning bilinguals. Many of these studies focus on a combination of a minority language, a dominant language and a 'foreign' language. For example, Cenoz (1991) and Cenoz and Valencia (1994) found that bilingual Basque-Spanish bilinguals outperformed Spanish monolinguals on English speaking, listening, reading, writing, grammar and vocabulary. Lasagabaster (1997) also compared Basque-Spanish bilingual and Spanish monolingual children in the Basque Country and found that bilinguals outperformed monolinguals on English oral and written proficiency and also showed a higher level of metalinguistic awareness. Sanz (2000) compared Catalan-Spanish bilinguals and Spanish monolinguals in Catalonia on English grammar and vocabulary and found bilinguals outperformed monolinguals. Sagasta (2001) compared different

levels of Basque-Spanish bilinguals on English writing and found that the higher the level of bilingualism the better the English writing proficiency. Brohy (2001) compared Romansch-German bilinguals and German monolinguals in Switzerland on the acquisition of pragmatic competence in French and found that bilinguals outperformed monolinguals. According to Cenoz (2013) the advantage of bilinguals over monolinguals in L3 acquisition is mostly associated with three factors: metalinguistic awareness, learning strategies and a broader linguistic repertoire. Metalinguistic awareness implies the way in which speakers are able to reflect and manipulate linguistic structures regardless their meaning (de Groot, 2011). Because bilinguals know two linguistic systems and because they have more language experience, they are thought to develop a higher level of linguistic awareness which positively influences L3 acquisition (Cenoz, 2013). Because of their language experience, bilinguals are also thought to have developed "a wider range of learning strategies", again having a positive influence on L3 acquisition (Cenoz, 2013, p. 76). Finally, the broader linguistic repertoire of bilinguals is thought to be of influence in L3 acquisition. Cenoz (2013) claims that the positive influence of the linguistic repertoire has been linked to language distance. Several studies show that this is especially an advantage in learning a L3 that is closely related to a bilingual's first two languages (De Angelis, 2007; Ringbom, 2007; Jarvis & Pavlenko, 2008).

Despite all these positive findings that indicate an advantage for bilinguals in L3 acquisition compared to monolinguals there are also studies that show no differences (e.g. Cenoz, 1997). According to several researchers these positive findings tend to only be found in additive learning contexts and not in subtractive learning contexts (Cenoz, 2003a). In other words, in contexts wherein the L1 is maintained and where it is not forced to be replaced by the new language, the advantages of bilingualism for L3 acquisition are bigger than in contexts where the L1 is no longer used and is replaced by the new language, for example because the new language has a higher status.

Other studies provide different explanations for their positive findings. For example, although Cenoz and Valencia (1994) found bilingualism had a significant influence on the four language skills, they found that general intelligence and motivation played a more important role (Cenoz, 2003a). Also, the role of literacy is found to be important. In the study by Sanz (2000) that compared Catalan-Spanish bilinguals and Spanish monolinguals on English acquisition it was found that balance of the written and not the oral skills was a significant predictor of L3 scores.

As the above has shown and as Cenoz (2003a) argues L3 acquisition is affected by many factors amongst which bilingualism. However, bilingualism is not necessarily the key factor in L3 acquisition. Therefore, it is essential to not only look at the influence of degree of bilingualism in L3 acquisition but also take into other

factors such as language background and motivation, which is what the current study does. Furthermore, it not only looks at oral language proficiency but also at psycholinguistic aspects (in terms of lexical access) of L3 development.

2.2 Factors influencing L3 development

Trilingual language acquisition is claimed to differ from bilingual language acquisition on several aspects as bilinguals are more experienced language learners (since they already know two languages) and have access to two linguistic systems (Cenoz, Hufeisen & Jessner, 2001; Herdina & Jessner, 2002). Cross-linguistic influence is one of the key issues studied in trilingual studies. Cenoz (2003b) claims that several factors play a role in cross-linguistic influence in L3 acquisition. First of all, these are individual and contextual factors such as age, anxiety, metalinguistic awareness, etc. (Cenoz, 2003b). For example, older learners show more traces of cross-linguistic influence in their L3 than younger learners (Cenoz, 2003c). SES can also influence success in additional language acquisition (De Angelis, 2015). As De Angelis (2015) has shown home literacy is higher in families with higher SES and this influences the literacy development of the children. Secondly, characteristics of the languages involved can have an influence, such as *typology, language status, proficiency in the different languages* and *frequency and recency of use* (Cenoz, 2003b; 2003c). Since these characteristics of the language play a role in the present dissertation, these factors are discussed in more detail below.

The first factor, *typology*, plays a role in L3 acquisition in that a typologically closely related L1 or L2 influences L3 acquisition more than a typologically more distant L1 or L2 (Cenoz, 2001). Sometimes it is not even the actual typological distance that is of most influence but *psycho-typology*, which is the perceived linguistic distance between languages by the learner (Kellerman, 1977; Jordens, 1977). (*Psycho-)typology* plays a role in the current study since the three languages involved are very closely related (as explained in section 1.2).

By *language status,* the psycholinguistic language status is meant here and not the political language status. Several studies involving *language status* suggest that the L2 plays a more important role in L3 acquisition than the L1. Already in 1983 Meisel suggested that this is because of a so-called foreign language effect in L3 acquisition in which the L1 is inhibited and the L2 is activated. Meisel (1983) suggested that due to the similarities in language processing and mutual associations between L2 and L3 it is easier for the learner to activate the L2 as opposed to the L1. Sanchez (2011) also claims that in L4 acquisition, non-native languages are more likely to be activated than the mother tongue regardless of typology, in other words even when the languages are not similar. If this holds for EB and LB in the current

study, EB L2 Dutch and LB L2 Frisian would receive higher activation in L3 English acquisition than their L1s.

Besides typology and language status, a third factor, *proficiency* in the languages studied plays a role. Several studies on the role of the L1 in L2 acquisition have shown that the stronger language can influence the weaker language (e.g. Bijeljac-Babic, Biardeau & Grainger, 1997; Dijkstra, Grainger & van Heuven, 1999). For example, beginning L2 learners tend to transfer more elements from their L1 to their L2 than more advanced learners (Cenoz, 2001). According to van Hell and Dijkstra (2002, p. 782) "relative language fluency will affect the bilingual's sensitivity to L1 interference when he/she is processing in L2, and the sensitivity to L2 interference when processing in L1." In the current study *proficiency* in the languages might result in LB showing more transfer (transferring words from another language into the target language) from their L1 in their L2 and L3 than EB while EB most probably will only make use of transfer in their L3, from their L1 and/or L2. Besides the use of transfer, *fluency* is also taken into account in the dissertation through measuring the use of different strategies such as the use of pauses, repetition, retracings, etc. Chapter 5 provides more details on these measures.

Finally, the fourth factor, *frequency and recency of use*, also plays an important role. De Bot and Jaensch state, following Grosjean's bilingual/multilingual mode model (2010, p. 132), that "languages will have different levels of activation at different moments in time, depending on need and recency of use". The choice for a language can therefore be domain-specific. For example, a bilingual speaker might only use the L1 at home and not at work and the L2 at work but not at home. The participants in the current study have just started secondary education and over the course of a school year they will be more exposed to different foreign languages, especially English. They will be less exposed to Frisian because Frisian is not used as a language of instruction in secondary education but only given as a subject for one hour a week (as explained in section 1.3.1). This might result in less use of Frisian at school for EB but still a high use at home. English on the other hand will be used more by both EB and LB because of the higher exposure to it at secondary school, compared to primary school.

2.3 Socio-psychological factors

The focus point socio-psychological factors refers to factors that possibly influence L3 development that were studied in the current study. These are briefly discussed here and in more detail in chapters 3 and 4.

As the earlier mentioned studies have shown degree of bilingualism can influence L3 acquisition (Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz,

2000; Brohy, 2001; Safont, 2005). However, there are more socio-psychological factors that influence L3 development. One of these is gender. Studies by Pavlenko and Piller (2007) and Wright (1999) have shown that females have a more positive attitude towards learning foreign languages and getting to know other cultures compared to males. Other studies found that girls were more motivated foreign language learners and were also willing to put more effort into language learning compared to boys (Dörnyei, Csizér & Németh, 2006). More information on the influence of gender can be found in section 3.2.1.3.

Another socio-psychological aspect that influences L3 development is SES, as was also briefly mentioned in section 2.2. According to De Angelis (2015) SES has been found to be a predictor of second language vocabulary knowledge, second language proficiency, second language comprehension and literacy in the first and second language. Tuckman and Monetti (2010) state that higher education is associated with a better occupation and higher income. SES can, according to Gorter and Ytsma (1988) also influence how people view languages. In their study on social factors and language attitudes in the province of Fryslân they found that people from a higher SES were less positive towards the Frisian language. More information on the influence of SES can be found in section 3.2.1.4.

Yet another socio-psychological factor that possibly influences L3 development is language contact. The amount of language contact plays a key role in additional language development (Kuiken, 2002; de Bot, Lowie & Verspoor, 2005; Thomas & Roberts, 2011). The more exposure and interaction a language learner gets in the target language, the easier it will be learned. The concept of *linguistic self-confidence*, which is the quality and quantity of the *contact* between the members of L1 and L2 communities, is a major motivational factor in language learning (Dörnyei, 2005). Section 4.2.1 explains this concept in more detail.

The attitudes and motivation towards languages and language learning is also taken into account in this dissertation. EB and LB most probably differ in their attitudes and motivation towards the three languages. For EB a positive attitude and high motivation towards Frisian is expected but due to the heavy stigmatisation of the language they might also feel insecure about their language skills. For this same reason, LB might be less positive and motivated to learn Frisian. and more positive towards Dutch and English which have a higher status than Frisian. It has long been agreed on by researchers that language development is influenced by the attitudes and motivation towards it (e.g. Gardner & Lambert, 1972). High internal motivation results in a positive attitude towards language learning (Lightbown & Spada, 1999). More recent studies zoomed in on the 'self' in language learning attitudes and motivation. Dörnyei (2005) came up with the *L2 Motivational Self System*

that distinguishes three ways in which one can be motivated towards successful L2 learning: intrinsic motivation, extrinsic motivation and the learning environment of the L2 learner. Section 4.2.2 discusses the details of this.

2.4 Oral language proficiency

The focus point oral language proficiency consists of self-assessment of language proficiency, an English vocabulary test and an oral language proficiency task. These are discussed in general here and in more detail in chapter 5.

First of all, the self-assessment of language proficiency is discussed. A low self-assessment of language skills can have a negative influence on the use of the language. A study by Williams (2002) with Welsh children showed that some children indicated their knowledge of Welsh as weak, despite the fact that they did well on examinations. A study on self-assessment of language proficiency in Fryslân showed that Frisian secondary school pupils rated their Dutch language skills higher than their Frisian and English skills (Popma & Arocena Egaña, 2013). The pupils even rated their English reading and writing skills higher than their Frisian reading and writing skills. For both the Welsh and the Frisian situation, the question arises what the influence of the low self-assessment is on the use of the particular language. Such low self-assessment of minority language proficiency could result in less self-confidence and prevent the children from using the language in a wider (social) context.

Next, the English vocabulary knowledge of the participants was tested by a yes-no vocabulary test. According to Huibregtse, Admiraal and Meara (2002) this type of test is a good method to measure the size of receptive vocabulary knowledge of foreign language learners. The items in a yes-no test consist of real words and pseudo-words and the task of the participants is to indicate whether or not they know the meaning of the word. Most yes-no tests correct for guessing by the participants in the scoring of the test. Section 3.3.3 discusses the test that was chosen for this dissertation.

Participants' oral language proficiency was studied through looking at the oral proficiency in Frisian, Dutch and English of both participants groups. Oral language proficiency was measured on: fluency, lexical fluency strategies and lexical richness. Fluency can be measured by looking at strategies that a language learner uses to speak as fluently as possible. For example, pauses, filled pauses like 'eh' or 'uhm', false starts, repetitions and trailing offs are being used. Fluency can be categorised to rate language learner's speech, which was done by help of a scheme by Skehan (2003) and Tavakoli and Skehan (2005), which is discussed in section 5.2.3. The disfluencies mentioned are often caused by a lack of language proficiency, buying the speaker time to continue his/her message. But it can also be (partly) due to speaking

style of the speaker, since these kinds of disfluencies can also occur in one's L1. The influence of L1 disfluencies in the target language fluency can be accounted for by partialling out the L1 variance from the target language measures (Segalowitz, 2010). In this way a more accurate measure of target language fluency is reached. This approach was adopted in this dissertation, as is explained in section 5.2.3.1. Besides these fluency strategies that are related to the speed of speech, there are also lexical fluency strategies that are related to the vocabulary used in speech. Cook (1996) argues that there are several strategies that language learners can use to fill in gaps in their vocabulary, for example through the use of transfer, neologisms, overextension, prompts or avoidance. All of these were taken into account in this dissertation, as is explained in section 5.2.3.1. Finally, lexical richness was studied. The vocabulary of beginning language learners consists mostly of simple and high frequent words whereas more experienced language learners use less frequent and more difficult words. How this worked for this dissertation's participants was studied by measuring lexical diversity, lexical sophistication and proportion of errors in the oral language proficiency tasks conducted by the participants. To measure lexical diversity, the number of different words and the number of times they appear in a text can be counted. However, caution has to be taken in this calculation because lexical diversity is sensitive to text length, as is discussed in section 5.2.3.3. Lexical sophistication measures the proportion of sophisticated or advanced words in a text (Johansson, 2008). For this the frequency of the words that are used by the participants is studied. According to Laufer and Nation (1995) low-frequency words are more sophisticated than high-frequency words. As said, beginning language learners tend to use more high-frequent words, thus less sophisticated words and more experienced language learners use less frequent and more difficult, thus more sophisticated words. By proportion of errors the use of words that do not exist in the target language is meant (Lindqvist, Gudmundson & Bardel, 2013). The proportion of errors can simply be measured by adding up all errors made by the language learner and calculate the proportion of errors in the total number of words used.

2.5 Lexical access

This section provides more background on the focus point lexical access. This topic is briefly discussed here and in more detail in chapter 6.

Lexical access and selection are central stages in word recognition. A much-debated issue in research on multilingual lexical access and selection is whether a multilingual's different languages are activated simultaneously. Most research on lexical selection in word recognition so far has suggested that lexical access is language non-selective (e.g. Kerkman, 1984, 1989; Dijkstra, Grainger & van Heuven,

1999; Dijkstra, Timmermans & Schriefers, 2000). In language non-selective lexical access, words from both or all languages in the mental lexicon are activated and compete for selection. In multilinguals, several candidates from the different languages compete for selection when the language user goes through the process of lexicalisation, as not only the intended lexical item, but also semantically and phonologically related lexical items will become activated to some extent and will compete for selection. For example, if a Frisian-Dutch bilingual who is an English language learner reads the English word *hand* not only phonologically related English words such as *sand*, *band* and *sang* become activated but also semantically related words like *arm*, *glove* and *finger* as well as word candidates from other languages, such as the Dutch *hand*, *zand*, *bang* and *arm* or Frisian *hân*, *bân* and *earm*.

Different models support the language non-selective view, among which the Bilingual Interactive Activation Plus model (BIA+) for word recognition by Dijkstra and van Heuven (2002). Dijkstra and van Heuven's (2002) main claim is that the lexicon is integrated and shared across languages and lexical access is parallel and non-selective. In their model, it is assumed that bilingual word recognition is affected by cross-linguistic orthographic similarities and phonological and semantic overlap (Dijkstra & van Heuven, 2002). One of Dijkstra and van Heuven's (2002) most important claims is that cognates are responded to faster than non-cognates because of a higher activation when the overlap between the input word and mental lexicon is larger. This is confirmed by findings from several studies which showed that cognates are responded to faster than non-cognates (e.g. Lemhöfer, Dijkstra & Michel, 2004; Hoshino & Kroll, 2008; Szubko-Sitarek, 2011). More details on how the model works and its hypotheses are discussed in section 6.2.1.

The level of activation of lexical items and thus how fast they are selected dependson several factors, such as, as explained earlier in this chapter, the frequency of use, the amount of contact with the languages and proficiency in the languages (Cenoz, 2003b; de Bot, 2004). That proficiency plays a role is confirmed by several studies that showed higher activation of languages for more proficient bilinguals compared to less proficient bilinguals (e.g. Bijeljac-Babic, Biardeau & Grainger, 1997; van Hell & Dijkstra, 2002; Duñabeitia, Perea & Carreiras, 2010). The question in this dissertation is how both degree of bilingualism and different socio-psychological factors possibly influence the speed of lexical access of EB and LB.

2.6 Development over time

The development over time is taken into account by means of the three measurements in one school year in the three focus points that this dissertation concentrates on. In each of these focus points, development over time was seen as dynamic. De Bot, Chan, Lowie, Plat and Verspoor (2012) argue that:

> Language development is not a linear process from no knowledge to advanced skills if conditions allow, but a process of development that consists of phases of growth and decline that are influenced by a combination of interaction with the environment and internal reorganization. (p. 191-192)

In other words, language development grows and declines and different components are concentrated on from one development phase to the other. Even more so, language development is influenced by different factors such as instruction in the language, language contact, etc. Interestingly, de Bot, Verspoor and Lowie (2007) also argue that language development has no 'end state', it will continue to develop. These were also the main reasons to include development over time in each of the focus points of this dissertation. Also, the relatively young participant group who was just starting to get English education made it interesting to study the language development at different time points. In the focus point socio-psychological factors, the argument for including development over time was that amount of language contact and the direction of language attitudes and motivation might change in the school year in which the participants were followed. Indeed, Dörnyei (2005) claims that not only language development but also motivation can be dynamic. For example, the participants' language contact most possibly changed when they made the transition from primary to secondary school since at secondary school they would have more language contact with Dutch and English and less with Frisian compared to primary school. This increasing number of English teaching hours might also influence their rating of self-assessment of language proficiency. This could increase because of more English education or decrease because for example results were disappointing. For the focus points oral language proficiency and lexical access, the development over time was included because of the interest in how the actual language proficiency developed, in fluency, vocabulary and underlying lexical processes. Would it show variability and be unstable as for example Schmid, Verspoor and MacWhinney (2011) and de Bot et al. (2007) claim?

2.7 Present study

As the earlier mentioned studies on trilingualism have shown, L3 development can be studied in many ways and from many different perspectives. It has become clear that not only L1 plays a role in the success of L3 development but also language contact, motivation, etc. However, most studies study the impact of bilingualism on L3 development from one perspective: the differentiation between monolinguals and bilinguals and measured at one point in time.

The current study takes a different and much broader approach. First of all, the current study distinguishes itself from earlier studies in that it looks at three very closely related West-Germanic languages: Frisian, Dutch and English. Secondly, to get a good understanding of what factors impact L3 development in the Frisian context, the current study concentrated on three relevant points of focus of L3 development: socio-psychological factors, oral language proficiency and lexical access.

The focus point socio-psychological factors deals with the question whether EB and LB differ on a) the amount and quality of language contact, b) their attitudes and motivation towards languages and language learning and c) the development over time in the amount and quality of language contact and participants' attitudes and motivation towards languages and language learning. Besides the differentiation between EB and LB, gender is taken into account. These questions are measured by means of a questionnaire (chapter 4).

The focus point oral language proficiency deals with the question whether EB and LB differ on a) their self-assessment of language proficiency, b) English vocabulary knowledge c) the actual oral language proficiency in Frisian, Dutch and English and d) the development over time in self-assessment of language proficiency, English vocabulary knowledge and oral language proficiency in Frisian, Dutch and English. The questions are answered by use of a questionnaire, English vocabulary task and oral language proficiency tasks (chapter 5).

The focus point lexical access deals with the question whether EB and LB differ on a) the accuracy and speed of lexical access in word recognition in Frisian, Dutch and English, b) the development over time in speed of lexical access in word recognition in Frisian, Dutch and English. For these questions the accuracy and speed of lexical access in word recognition in Frisian, Dutch and English is studied, testing the hypotheses of the BIA+ model (chapter 6).

Chapter 3 - Methodology

The previous two chapters have described the linguistic situation in Fryslân and the theoretical background of the three focus points of the dissertation. Before the results of the different instruments used are discussed in chapters 4, 5 and 6, the current chapter discusses the methodological set-up of the dissertation. It provides background information on the participants as well as research procedures, the different research instruments that were used and the statistical analyses that were performed.

3.1 Recruitment of participants

3.1.1 Selection of schools

All participants were first year secondary school pupils at higher general secondary education - pre-university education level (HAVO/VWO level in Dutch). They followed English foreign language classes for an average of two hours per week. Dutch and Frisian were also compulsory subjects at the selected schools, for an average of 2.5 and 1 hour(s) per week respectively. The language of instruction at secondary school was predominantly Dutch for all subjects at all participating schools. None of the participants had attended a trilingual primary school.

The participants were selected from three Frisian secondary schools: the first was situated in a village in the southwest of Fryslân, the second school in the capital city of the province and the third school in a small city in the southwest of the province. The schools were consciously chosen to represent an accurate reflection of Frisian young adolescents. The first two schools participated in all three measurements. Due to an imbalance in EB and LB participants in the first measurement, the third school was added after the first measurement and participated in the study from the second measurement onwards, as shown in table 1.

Table 1. Overview measurements per school.

	Time 1	Time 2	Time 3
Capital city school	X	X	X
Village school	X	X	X
Small city school		X	X

3.1.2 Division into EB and LB

In total, there were 77 participants. They were divided into two groups based on what they, their parents and their teachers indicated as their main mother tongue, the language they used most at home. This resulted in a division of 34 early bilingual Frisian-Dutch speakers (EB) and 43 later bilingual Dutch-Frisian speakers (LB). They were called early and later bilingual speakers because of an assumed difference in degree of Frisian-Dutch bilingualism. As explained in the introduction in chapter 1, EB have simultaneously acquired L1 Frisian and L2 Dutch from birth at home. It can be expected that as a result, they have equal (oral) proficiency in Frisian and Dutch, especially since Dutch is the dominant language as was explained in chapter 1. LB have sequentially acquired Dutch at home from birth and Frisian at school from an average age of 7.2 years. Hence, that is why this group was labelled 'later' and not 'late' bilinguals. It can be expected that LB have unequal (oral) proficiency in Dutch and Frisian since they are mostly L2-learners of Frisian and mutually differ in level of (oral) Frisian proficiency. For more details on the participants' language background, see tables 8 and 9 in section 3.2.2. Table 2 shows the division of EB and LB per school. As was to be expected because Frisian is mainly spoken in the rural areas, more LB than EB participants attended the capital city school, more EB than LB participants attended the village school and the small city school had an about equal amount of EB and LB participants.

Table 2. Division of EB and LB per school (N=77).

	EB	LB	Total
Capital city school	6	23	29
Village school	16	3	19
Small city school	12	17	29
Total	**34**	**43**	**77**

3.1.3 Introduction study at schools

The researcher introduced herself to the participants at the participating schools prior to the actual first data collection. In this short introduction to the participating schools and participants, she explained the goal of the study and provided more information on the different research instruments and what was expected from the participants. Some parts of the study were done in class (e.g. questionnaires and English vocabulary test) and other parts were conducted individually (e.g. oral language proficiencyand experiments). The participants' parents were all informed on their child taking part in the study and they gave active consent by signing a paper that stated the data would be handled with confidentiality.

3.1.4 Research assistants

The researcher worked together with several research assistants that assisted in conducting the individual tests and experiments. In total 4 research assistants assisted during the different measurements. These were almost always the same research assistants in each school which helped the participants feel at ease during the different parts of the data collection. Only the city school had a different research assistant during the second measurement because the regular research assistant was unavailable. The research assistants were trained before the start of the data collection and familiarised with the research instruments and the procedures. This was done to assure that each research assistant gave the same instructions and followed the same rules.

3.2 Background information of participants

The participants all completed an extensive background questionnaire. The questionnaire was partly based on earlier used questionnaires (Gullberg & Indefrey, 2003; Berns, de Bot & Hasenbrink, 2007). The questions were divided in different categories. The results that are discussed below were on:

A - general information on age, gender, place of birth, etc.
B - languages used at home with family
C - language background

3.2.1 General information participants

3.2.1.1 Age

The average age of the 77 participants over the whole school year - 12.9 years old - is shown in table 3.

Table 3. Age of participants (N=77).

	N	Min.	Max.	Mean	SD
Age participants	77	12.2	13.6	12.9	0.36

3.2.1.2 CITO attainment test

To check homogeneity in participants' scholastic aptitude, the results on the attainment test they took at the end of primary schools (CITO-test - comparable to the suite of assessments (SAT)) were compared. Results showed that EB scored an average of 542 points (SD 3.39) compared to 544 points for LB (SD 3.19) out of a maximum of 550 points, which was a non-significant difference ($t(75)=-1.89$, $p > .05$). In other words, there were no differences in scholastic aptitude between EB and LB and therefore this was not taken into account in the analyses of the three points of focus (socio-psychological factors, oral language proficiency and lexical access).

3.2.1.3 Gender

Besides degree of bilingualism, being EB or LB, gender might play a role in the three focus points. Research has shown that females have a more positive attitude towards learning foreign languages and getting to know other cultures compared to males (e.g. Pavlenko & Piller, 2007; Wright, 1999). There are also gender differences in activities that involve language. For example, a European study by Bonnet (2004) showed that Swedish boys watch more television and play more videogames than girls. These activities are mostly in English. In the Frisian context, this would imply that boys are more exposed to English than girls since a lot of television they watch and games they play are in English. On the other hand, girls spend more time listening to music and lyrics compared to boys, which are also mostly in English (Bonnet, 2004). The time boys and girls spend on different activities involving language might influence their self-assessment of language proficiency. Indeed, Bonnet (2004) found that girls viewed English as more useful than boys did. Furthermore Bonnet (2004) found that girls believed they learned more English at school than boys did. Besides gender differences in language contact and self-assessment of language proficiency, there can also be gender differences in language attitudes and motivation. Dörnyei, Csizér and Németh (2006) found that girls were more motivated foreign language learners and were also willing to put more effort into language learning compared to boys. Girls are also believed to be more successful in foreign language learning (e.g. Carr & Pauwels, 2006; Ryan, 2009). Table 4 shows the division of the participants by group (EB or LB) and gender.

Table 4. Division of participants by gender (N=77).

	EB	LB	Total
Boy	12 (15.5%)	22 (28.5%)	34 (44%)
Girl	22 (28.5%)	21 (27.5%)	43 (56%)
Total	**34 (44%)**	**43 (56%)**	**77 (100%)**

As the table shows, the EB group of boys had fewer participants. A chi-square test showed that there was no significant association between gender and L1 (EB/LB): $\chi^2(1)=9.94, p > .05$. The current study takes gender into account in the analyses of all three focus points (socio-psychological factors, oral language proficiency and lexical access) because the studies mentioned above report differences in language contact, language attitudes and motivation but also the success in foreign language learning between boys and girls.

3.2.1.4 Socioeconomic status (SES)

SES has been found to be a predictor of second language vocabulary knowledge, second language proficiency, second language comprehension and literacy in the first and second language (De Angelis, 2015). Indicators of SES are educational level, income and occupation. In general, higher education is associated with a better occupation and higher income (Tuckman & Monetti, 2010). The socio-economic environment is critical in the success of second language development. The attitudes of caretakers towards (learning) a certain language - positive and motivated or negative and demotivated - can influence their children's attitudes towards (learning) this language. As De Angelis (2015) argues, higher educated parents might discuss language learning more, be more supportive in financing a trip to an English-speaking country and help their children with their homework. De Angelis (2015) also mentions that home literacy is typical of families with higher SES, which in turn influences the literacy development of the children. In De Angelis' study, on the role of parental education and L2 exposure on trilingualism with 14-year old students, parental education turned out to be "strongly connected to school performance" (2015, p. 13). The children of highly educated parents showed higher literacy skills than children of less educated parents. Besides these positive effects of (higher) SES, there can also be negative effects. Gorter and Ytsma (1988) found that SES can influence how people view languages. Their study on social factors and language attitudes in the province of Fryslân revealed that people from a higher SES were less positive towards the Frisian language (Gorter & Ytsma, 1988). This most probably has to do with the status of Frisian, which is often viewed as lower than Dutch or English and as a result the motivation of parents and their children to learn or maintain the language is low. Benedictus (2005) looked at teacher-training students' attitudes towards language learning and just as Gorter and Ytsma (1988) found that students from a higher SES were more negative towards the Frisian language than middle-class SES students (Benedictus, 2005). Driessen, Doesborgh, Ledoux, Overmaat, Roeleveld and Veen (2005) concluded that school success depends to a large extent on the level of SES: the higher, the more successful. The level of SES someone aims to achieve is dependent on the SES level one starts at. According to De Boer (2009) pupils from a low SES need a higher target level since they have a steeper climb ahead up on the social ladder compared to pupils from a high SES who are already high up the social ladder. Kuyper and van der Werf (2001) found that low SES pupils' target levels were lower than high SES pupils' target levels.

What these studies show, is that SES does not stand on its own but interacts with different factors. In the current study parents' educational level was taken as the single indicator of participants' SES. SES was calculated by looking at parents'

educational level and dividing it in low, medium and high following the classification made by the Central Bureau for Statistics (2016):

Table 5. Division in low, medium and high SES.

Low	VMBO	- preparatory general secondary vocational education
	MAVO	- intermediate general secondary vocational education
	LBO	- lower vocational education
Medium	MBO	- intermediate vocational education
	HAVO	- higher general secondary education
	Atheneum	- pre-university secondary education
High	HBO	- higher vocational education
	WO	- university

The information on SES was available for 65 of the 77 participants. For each family where the educational level of both parents was known, the highest educational level was chosen as the reference point for indicating SES.

Table 6. Social Economic Status (SES) of the participants (N=65).

	EB	LB
Low	3 (9.68%)	1 (2.94%)
Medium	16 (51.62%)	8 (23.53%)
High	12 (38.71%)	25 (73.53%)
Total	**31 (100%)**	**34 (100%)**

Table 6 shows that there was a difference in the level of SES between EB and LB parents ($\chi^2(2)=8.11$, $p = .017$) with a medium effect size of phi (φ) = .35. Three-quarters of the LB parents had a high education level compared to one-third of the EB parents. Half of the EB parents were medium level educated whilst one-quarter of the LB parents was. There were also differences between the EB and LB mothers and fathers. A similar percentage of EB and LB mothers followed medium level education, 48.4% and 45.5% respectively. There were more LB mothers (45.5%) that had high level education compared to EB mothers (35.5%). More EB mothers had low-level education (EB: 16.1% vs. LB: 9.1%). But the main difference was in the fathers' education. Twice as many EB as LB fathers had low-level education (13.8% vs. 6.7%). Of the EB fathers 72.4% followed medium level education compared to 33.3% of LB fathers. More LB than EB fathers followed high-level education (EB: 13.8% vs. LB: 60%). Despite these

differences in SES between EB and LB and unlike gender, SES was not taken into account in the analyses of any of the three points of focus (socio-psychological factors, oral language proficiency and lexical access). The main consideration for not including SES was that the information on SES was not available for all the participants' parents (65 out of 77 participants). Secondly, from the questionnaires that were collected the level of SES seemed to be in line with the division into EB (low and medium SES) and LB (high SES) and so was already accounted for.

3.2.1.5 Place of birth

Of the 77 participants, 71 were born in the province of Fryslân and 6 participants were born in other provinces of the Netherlands. Table 7 shows how long the 77 participants had been living in the province of Fryslân, which for most of the participants was their whole life. The 4 participants that lived outside Fryslân for the first years of their lives were all LB participants.

Table 7. Years living in Fryslân (N=77).

	EB	LB
entire life	34 (100%)	39 (91%)
1 year	0 (0%)	1 (2%)
2.5 years	0 (0%)	1 (2%)
8 years	0 (0%)	1 (2%)
10 years	0 (0%)	1 (2%)
Total	**34 (100%)**	**43 (100%)**

3.2.2 Language background

Table 8 shows what language(s) the participants indicated as their mother tongue, the language they initially learned. This was almost always the same as their parents' mother tongue. Of the LB parents 9 filled in that they had Frisian as their single mother tongue but only one LB parent indicated he spoke Frisian to his child. Most of the participants were raised monolingually, just a few were raised in Frisian and Dutch or Frisian or Dutch in combination with a dialect. Three participants spoke a dialect with their parents: Liwwadders or Bildts. One participant spoke Bildts in combination with Frisian, the other spoke Bildts in combination with Dutch. The participant that spoke Liwwadders also spoke Dutch at home. In further analyses the dialects were not taken into account but participants were grouped as either Frisian L1 (EB) or Dutch L1 (LB). One LB participant was originally raised in Frisian but the parents switched to Dutch when the participant was

8 years old. Another LB participant had a Dutch father and Spanish mother. This was a trilingual family in which the parents spoke English amongst each other, the father spoke Dutch and the mother spoke Spanish to the participant. Table 6 also shows the language(s) the participants currently spoke with their parent(s) and siblings. There were more LB than EB participants in the study and so Dutch was spoken most with the parents. One participant spoke Spanish with his mother and Dutch with his father. All but four participants had siblings. Most participants spoke one language with their siblings, which was their L1, Frisian or Dutch.

Table 8. Mother tongue(s) of the participants and language(s) spoken with parents and siblings (N=77).

	mother tongue		language spoken with parents		language spoken with siblings	
Languages	EB	LB	EB	LB	EB	LB
Frisian	26 (76%)	1 (2%)	28 (82%)	0 (0%)	29 (85%)	0 (0%)
Dutch	0 (0%)	37 (86%)	0 (0%)	37 (86%)	0 (0%)	37 (86%)
Frisian + Dutch	7 (21%)	2 (5%)	5 (15%)	4 (9%)	4 (12%)	2 (5%)
Dialect (+ Frisian or Dutch)	1 (3%)	2 (5%)	1 (3%)	1 (2%)	0 (0%)	1 (2%)
Dutch + Spanish	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)
Total	**34 (100%)**	**43 (100%)**	**34 (100%)**	**43 (100%)**	**33 (97%)**	**40 (93%)**

Table 9 shows whether participants spoke Frisian, Dutch and/or English and when and where they learned the language(s). All 34 EB participants indicated to be able to speak Dutch. Of the LB participants 32 out of 43 (74%) indicated to be able to speak (some) Frisian. 74 participants indicated to speak English. The participants were also asked when and where they had learned the different languages (divided in three categories), which can also be seen in table 9. Both groups learned Frisian and Dutch from a young age. As explained in the introduction of the dissertation and in section 3.1.2, the difference between the two groups was that the EB were all simultaneous bilinguals who acquired both languages from birth. The LB were sequential bilinguals as they learned Dutch as L1 from birth and Frisian as L2 from the average age of 7.2 years old. The majority of EB learned Dutch at home while the majority of LB learned Frisian at school. Both groups started learning English at the age of around 8.5 years old, both at home and at school and a small number of participants (6) also from friends or on holiday.

Table 9. Languages spoken by the participants and learned when and where.

	languages spoken by participants		age of language learning		learned at home / from family		learned at school		learned from friends, on holiday or other	
	EB	LB	EB	LB	EB	LB	EB	LB	EB	LB
Frisian	34 (100%)	32 (75%)	.6	7.2	34 (100%)	15 (35%)	6 (8%)	25 (58%)	0 (0%)	6 (14%)
Dutch	34 (100%)	43 (100%)	1.9	0.3	26 (76%)	43 (100%)	25 (74%)	5 (12%)	2 (6%)	0 (0%)
English	33 (97%)	41 (96%)	8.8	8.7	8 (24%)	15 (35%)	29 (85%)	31 (72%)	1 (3%)	5 (12%)

3.2.3 English language knowledge

To get an idea of how much English the participants already knew when they started secondary school, they were asked about their English language lessons at primary school and whether they had ever been abroad and used English on a regular basis.

3.2.3.1 English at primary school

As part of the curriculum at primary school most of the participants except 1 (2 participants did not fill in this part) had had some English and Frisian lessons for an average of one hour per week per language and Dutch lessons between 6 and 8 hours per week. Most had had 1 to 2 years of lessons, some more as can be seen in table 10. There were no statistical differences ($\chi^2(4)=4.93$, $p > .05$) between EB and LB.

Table 10. Years of English lessons at primary school (N=77).

		EB	LB
Yes		33 (97%)	40 (93%)
	1-2 years	21 (62%)	34 (79%)
	3-4 years	7 (21%)	4 (9%)
	5-6 years	2 (6%)	1 (2%)
	7-8 years	1 (3%)	0 (0%)
	don't know	2 (6%)	1 (2%)
No		1 (3)	1 (2%)
Total		**34 (100%)**	**41 (96%)**

3.2.3.2 English used abroad

Participants were also asked how often and for how long they had been abroad and used English. 64.7% of EB and 70% of LB had been abroad and used English, which was not a significant difference ($\chi^2(1)=0.24$, $p > .05$). Most of the visits were holidays between 1 to 5 weeks. The participants mostly visited European countries such as France, Germany, the United Kingdom or Italy. Just a few visited countries further away such as America. In all these countries, the participants used English.

Other uses of English outside school, such as the use of Internet are discussed in chapter 4.

3.3 Research instruments

3.3.1 Overview different measures

Table 11 provides an overview of the different measures that were used during the three measurements.

Table 11. Overview of different tests used during the three measurements.

Task	Time 1	Time 2	Time 3
Pupil questionnaire	x	x	x
EFL vocabulary test	x	x	x
Picture story task in Frisian, Dutch and English	x	x	x
Lexical Decision Task and Word Naming Task	x	x	x

The following sections discuss each of the research instruments and procedures in more detail.

3.3.2 Questionnaire

3.3.2.1 Pupil questionnaires

In the introduction of section 3.2, a questionnaire was described that was used to collect general information of the participants and on their language use at home and language background. The questions were divided in different categories and three versions of the questionnaire were designed, one for each measurement. The first questionnaire was the most comprehensive and included questions on participants' background, which has been discussed in section 3.2. The other questions were on:

A - language in general
B - language at school
C - English outside school

These questions were almost all repeated in the second and third measurement. The first questionnaire contained 35 questions, the second questionnaire contained 10 questions and the third questionnaire contained 16 questions. Questions that were the same in every measurement were on:

- self-reported language skills
- enjoyment, confidence and importance of language learning
- current English teacher and lessons
- contact with English outside school

The questions that were similar in measurement 1 and 3 were on:

- effort and joy of language learning
- language diary on the use of Frisian, Dutch and English
- percentage of English learned in- and outside school

Part of the questions could be answered by yes/no or multiple-choice. Quite a substantial part of the questions involved self-assessment. This was measured as simple and straightforward as possible. For example, participants self-assessed their speaking, listening, reading and writing skills in Frisian, Dutch and English using a 5-point scale from "not at all" to "very good". Other 5-point scales that were used were from "disagree" to "agree" and from "difficult" to "easy". The result of the rating was analysed, not how well participants were able to fill in self-assessments. The pupil questionnaires used in measurement 1, of which parts were used in measurements 2 and 3, can be found in appendix A.

The questionnaires were conducted with the whole class. Time was allotted for this during one of the regular lessons. It took participants between 10 and 15 minutes to complete.

The outcomes of the questionnaires, the parts on general information, languages used at home and language background were discussed in section 3.2 of this chapter. The remaining outcomes are discussed in chapter 4.

3.3.2.2 Parents' questionnaire

The participants' parents filled in one questionnaire during the second measurement. This questionnaire was partly based on an earlier questionnaire designed by Dijkstra (2013). The questions concerned:

A - background of the child
B - background of the parent(s)
C - language environment of the child

The parents received the questionnaire through their children during the second measurement. Out of the 77 participants 65 parents filled in the questionnaire. The outcomes of the questionnaire were partly discussed in section 3.2.1.4 of this chapter (on SES) and the remaining outcomes are discussed in chapter 4. The parent questionnaire can be found in appendix B.

3.3.3 EFL vocabulary test

Materials

During each of the three measurements the participants' English vocabulary was tested with the *English Foreign Language vocabulary test* (EFL vocabulary test) developed by Meara (1992). This test consists of 5 levels of vocabulary with 20 tests each. The first two levels are the basic tests and cover the core vocabulary of 2000 words that a speaker needs to know to be able to understand what they hear or read and make themselves understood (Meara, 1992). Level 1 represents a basic level of competence, just enough for learners to get around but not enough to communicate easily in English. Level 2 represents a slightly more advanced vocabulary. According to Meara (1992) speakers at this level should be able to communicate in English in limited and predictable situations. Each test contains 60 items of which 40 are real words and 20 are non-words. The participant has to decide for each word whether it is a real word or not. By putting the non-words in, it can be calculated how much of the words the participants 'guess' by simply taking the number of real words and the number of non-words that the participant claims to know and putting it in a formula that estimates the actual number of words the participant knows (Meara, 1992). The more 'guessing' the participant does, the more it will negatively influence the vocabulary score, as calculated using item-respond theory (Huibregtse, Admiraal & Meara, 2002).

For this dissertation, the first three tests of levels 1 and 2 were used, with parallel versions for each measurement. However, since level 2 turned out to be too difficult for the participants, these results were left out. As an extra precaution against 'guessing', the participants were asked to translate the first five words, which they claimed they knew, to Dutch. These translations were not analysed since they merely served as a precaution against guessing.

Procedure

The EFL vocabulary test was conducted in class and took about 5 minutes to complete. The results were calculated in percentages and are presented in chapter 5.

3.3.4 Picture story task

Materials

The participants' Frisian, Dutch and English oral proficiency was measured by using an elicitation instrument called 'picture story task'. This task contains stories with pictures but without words. The picture story task has been widely used in different contexts and languages all over the world. The picture story task is often used to measure whether participants can tell a coherent story. In the current study the main aim was to measure participants' oral proficiency. This was done by transcribing and analysing the recorded spoken language that was elicited through the picture stories.

For this study, 6 picture stories were selected from the 1975 picture storybook by Heaton. Heaton's picture stories (1966, 1975) are regularly used in bilingual studies (e.g. Kormos & Trebits, 2012). The stories generally have an element of surprise in them and are designed in such a way that participants have to discuss the motivation of the characters in the story (de Jong & Vercellotti, 2016). During each of the three measurements the participants were presented with 2 picture stories, as shown in table 12.

Table 12. Overview picture stories per measurement.

Picture story	Time 1	Time 2	Time 3
Story 1 - A clever dog	X		
Story 2 - Wet paint	X		
Story 3 - Hit and miss!		X	
Story 4 - The table that got smaller		X	
Story 5 - Landslide!			X
Story 6 - Waiting for a bus			X

From measurement 1 to 3 the picture stories increased in difficulty, for example by going from 4 to 6 pictures. This was done in line with the assumption that participants' language proficiency would grow as the school year progressed.

Procedure

The picture story task was administered three times during each measurement at one-week intervals. The participants were asked to tell the stories in Frisian, Dutch and English. The first week the participants spoke in their L1, the second week in their L2 and the third week in their L3. This order was consciously chosen to give participants the chance to start in their strongest language. For example, an EB performed the task in the following order:

Week 1: Frisian
Week 2: Dutch
Week 3: English

The picture story tasks were conducted in quiet rooms the participating schools made available. The tasks were conducted individually per participant. During the task and the recording of it, the researcher and participant were seated opposite of each other at a table. Each picture story task took between 2 and 10 minutes to complete, depending on how much time the participant needed. Before the start of each recording the participants were given the instruction in Frisian, Dutch or English, depending on the target language of the particular session. The instruction participants received during the English picture story task is given below:

Script for explanation of tasks

Instruction English picture story task third time
Goodmorning! So, you know what we are going to do today. Today you will have to tell the story in English. Take your time, look at the pictures carefully and don't worry about words you don't know. If there's a word that you really don't know, you can ask my help. Good luck!

The influence of the researcher / research assistants was kept to a minimum. In the picture story task in the L1 and L2 (Frisian/Dutch) they mainly only commented with 'yes', 'no' and 'well done' with the exception of the Frisian L2 picture story task in which LB sometimes got stuck and needed help. In the L3 (English) picture story task the participants sometimes needed more support. The research assistants were instructed that they could help the participants through providing (the translation of) a word if:

1) the participant asked for help
2) the participants got stuck and was silent for a couple of seconds

Coding

All picture story tasks were audio taped. The researcher and a fifth research assistant transcribed and coded the recordings in PRAAT (Boersma & Weenink, 2017). A detailed handbook and regular consultation between the researcher and research assistant made sure that the transcriptions and coding was done consequently and similarly. An overview of the different codes that were used, based on an earlier codebook used by van der Meij (2008), is given in table 13.

Table 13. Codes used in the transcriptions of the picture story tasks.

Code	Meaning
xxx	unintelligible word
[?]	best guess
@x	redundant word
0	omitted word
+...	trailing off
+/.	interruption
+//.	self-interruption
+,	self-completion
++	other completion
[/]	repetition
[//]	retracing
[///]	reformulation
eh@fp	filled pause 'eh'
@i	filled pauses such as hm, mmm, uhm, oh, aha, noh, yes, no, etc.
@o	onomatopoeia
@d, @f, @e	transfer from other language into target language, e.g. Dutch word in English
@vg	prompts
[* n]	neologisms
[* le]	lexical errors
[* gr]	grammatical errors
[+ exc]	utterances that should be excluded from the analysis

It turned out that the Frisian picture story tasks were most difficult to transcribe and code since Frisian knows a lot of varieties and is heavily influenced by Dutch. To judge whether words were truly Frisian several sources were consulted. First of all, the online dictionaries Taalweb [Language web] (Fryske Akademy, 2017) and Wurdboek fan de Fryske Taal [Dictionary of the Frisian Language] (Fryske Akademy, 2010). Secondly, three Frisian lexicographers of the Fryske Akademy were presented with a list of words for which they were asked to indicate whether they were accepted Frisian words. Based on these sources a list of accepted Frisian words was made that were used in the transcriptions and codings.

The task was further coded and analysed in CLAN, which is part of the CHILDES (Child Language Data Exchange System) programme (MacWhinney & Snow, 1985). For the coding of the transcripts a codebook was developed, partly

based on an earlier codebook used by van der Meij (2008) to measure oral skills in Frisian, Dutch and English of primary school children. Table 14 shows an overview of all features that were measured.

Table 14. Overview measured features of transcriptions.

Fluency
number of filled pauses
number of repetitions, retracings and reformulations
number of trailing offs
number of self-completed sentences

Lexical fluency strategies
number of transfer
number of prompts
number of neologisms
number of lexical errors
number of grammatical errors

Lexical richness
lexical diversity: D
lexical sophistication
proportion of errors

The results were analysed in SPSS and are presented in chapter 5.

3.3.5 Experiments

The most widely used tasks to test bilingual visual word processing based on models like the BIA+ model, are two reaction time experiments: the Lexical Decision Task (LDT) and the Word Naming Task (WNT). In the LDT participants have to indicate whether the letter string they see on the computer screen is an existing word or not by pressing a 'yes' or a 'no' button as fast as possible. In the WNT participants have to name the word that appears on the screen as fast as possible. In both experiments reaction times (RTs) are registered. It was decided to use both the LDT and WNT because the semantic component plays more of a role in the LDT and the phonological component more so in the WNT. Furthermore, by using both tasks a "converging-evidence approach" was taken which is in line with the study by de Groot et al. (2002, p. 95). As de Groot et al. (2002) explain:

> Similar effects of a particular variable across the two tasks will suggest that the effect concerned has its locus in the assumed common word-recognition component of both tasks. Different effects across the two tasks will suggest that this variable taps into (one of) the tasks' unique components, those not shared between the tasks. (p. 95)

Both the LDT and WNT consisted of prime-target pairs and used a masked semantic priming technique to measure whether any semantic priming effect could be detected. In both experiments the prime was shown too short to be consciously registered by the participant. It was therefore hypothesised that any observed priming effects could not be a result of any conscious recognition of the relationship between the prime and target. In other words, any priming effect to be found could not be the result of any conscious translation between prime and target (de Groot et al, 2002). Section 6.2.3 explains this in more detail.

Materials

Both the LDT and the WNT stimuli consisted of written words that were either real words or pseudo-words. The primes and targets were either related or unrelated, in other words translations or non-translations. Only between-language priming was used, in which the primes and targets were given in different languages, for example the Dutch prime *haai* followed by the English target *shark* or the English prime *grandpa* followed by the Frisian target *pake* (see table 15 below for cognate combinations). For the LDT participants had to indicate whether the target was a real word by pressing a *yes* or a *no* button. Reaction times (RTs) and accuracy scores were registered. For the WNT participants had to name words that appeared on the computer screen and their RTs were registered as soon as they started to speak.

For both experiments English (the L3) was the focus of the dissertation. Therefore, language pairs L1->L2 and L2->L1 were left out and only L1->L3, L3->L1, L2->L3 and L3->L2 were tested. This resulted in the following language pairs: Frisian-English / English-Frisian and Dutch-English / English-Dutch. The selected stimuli were all high frequent concrete words with a maximum of two syllables, selected from the English course book of the participants and the British National Corpus to which the Frisian and Dutch translations were added. Pseudo-words were added to the selected words. Linguists from the Fryske Akademy developed the Frisian pseudo-words. The Dutch and English pseudo-words were generated using WordGen (Duyck, Desmet, Verbeke & Brysbaert, 2004). In total 400 words were selected and divided over the two tasks and four language pairs (50 words each). To study the semantic priming effect the prime-target pairs consisted of different relationships: 25 related and 25 unrelated words were used per language pair for

both experiments. The 25 related words were all translation pairs and consisted of 40% double cognates that occur in two of the three languages (Frisian and Dutch), 40% triple cognates that occur in all three languages (Frisian, Dutch and English) and 20% words that were true translations but non-cognates. The 25 unrelated words were all non-translations. For the LDT 200 pseudo-words were added, 50 per language pair. Table 15 provides an overview of the different prime-target relationships used in both experiments.

Table 15. Prime-target relations used in experiments (*only used in LDT).

Category	Frisian translation	Dutch prime	English target
Cognate 2	haai	haai	shark
Cognate 3	klok	klok	clock
Non-cognate	pake	opa	grandpa
Unrelated	foarke	vork	neck
Pseudo-word*	skeppe	schep	*fourd

The complete wordlists of both the LDT and WNT can be found in appendix C.

The time course of both experiments was as follows: a fixation point was shown for 500 milliseconds (+), after which a mask consisting of hash marks (######) appeared for 500 milliseconds followed by the prime which was shown very briefly for 100 milliseconds and finally, the target for which participants had a maximum of 5 seconds to respond.

Procedure

The experiments were conducted in E-Prime 2.0 (Psychology Software Tools) using a laptop and a response box and microphone. For the first measurement, the E-Prime Serial Response Box and the microphone were used. For the second and third measurement, a Serial Response Box with microphone designed by the University of Groningen was used because this Response Box was easier to handle for the participants. Since the response box and microphone were very sensitive, participants were asked to only say the words, try not to sneeze or cough and speak clearly into the microphone.

The LDT and WNT were conducted individually in quiet rooms at the participating schools. The participants were put behind a laptop on which they were presented with the experiments. The experiments were conducted in two rounds in two consecutive weeks. In the first week participants did the experiments in their L1 and L3 and in the second week in their L2 and L3. They started with the

LDT followed by the WNT. They got practise items before every new experiment or language set. This was not only intended for them to familiarise themselves with the task but also done to put them into the right language mode. During the experiments, the researcher / research assistant was there to assist whenever necessary and also, to record the WNT and make notes on hesitations or interruptions that could influence the results. The instruction was always in the language that was tested in the specific week. For example, an EB conducted the experiments in L1 Frisian and L3 English in the first week and so the instructions were in Frisian. In the second week of testing the experiments were conducted in the L2 and L3 of the participants. In the case of an EB this meant Dutch and English and so, the instructions would be in Dutch. Participants were given the instruction below (translated from Frisian and Dutch). In line with the instructions on the screen, the researcher / research assistant addressed the participants in the language they conducted the experiments in.

Script for explanation of experiments

Instruction experiments
Goodmorning, today we'll start with the computertests. With these tests we study how language works in your head. These are assignments that involve Dutch and English. First you are asked to indicate for two sets of words - Frisian/Dutch and English - whether the words are real words or fake words. After that you are asked to read two sets of Frisian/Dutch and English words aloud.
For the first test you'll need this response box. You see a YES and a NO button. You'll need those to indicate whether the words you see on the screen are real words or not. Let's see whether you can reach the buttons. Is it okay like this?

For the second test you'll need this microphone to read aloud the words. During the test you'll get a signal saying when you'll need it. I'll put it in the right place for you. That part of the test will also be recorded, just as I did during the picture story task.
The assignments are shown on the computerscreen and before the real test starts, you'll have the chance to practice the assignment.
Do you have any questions? ... Let's start!

It took participants between 15-20 minutes to complete a whole session of the two experiments (LDT and WNT in two language pairs).

Analysis

E-Prime registered the RTs for both experiments and the WNT was audio taped. In addition to this, the researchers took notes on errors like hesitations or interruptions that might have influenced the RTs. First of all, incorrect responses were removed and accuracy scores for the LDT were calculated. The data was then trimmed

following guidelines by Jiang (2011). The LDT data was trimmed at a low cut-off point of 300ms and a high cut-off point of 3000ms. The WNT data was trimmed at a low cut-off point of 300ms and a high cut-off point of 1500ms. The data was then analysed in SPSS. The results of the experiment data are presented in chapter 6.

3.4 Pilot study

Prior to the start of the study in the school year 2012-2013, a pilot study was carried out in June 2012. It included all parts of the study's materials developed at that point. The experiments that were used were different to the ones used in the final research set-up. The pilot study was carried out with 19 high-level secondary school pupils, who were at the end of their first year. The pilot study was set up to see whether the developed research material was suitable for the intended participants, whether instructions were clear and procedures correct. In general, the pilot study was successful as the participants completed the different parts without difficulties. Some general remarks were made on e.g. the length of the questionnaire and the instructions of the EFL vocabulary test. These remarks were processed in the improved versions of the research material that was then used in the actual study.

3.5 Statistical analyses

3.5.1 Multilevel regression model

Most of the data was analysed using a multilevel regression model. As in all regression models the multilevel regression model looks at possible relationships between a set of dependent and independent variables and includes development over time. In general, a multilevel regression model starts with an empty model to a more complicated model in which it tries to find the best 'fit'. The advantage of multilevel regression models is first of all that it can account for missing data, which made it perfect for the current study since one group of participants (the third school) only participated from the second measurement onwards. Besides that, sometimes participants missed (part) of a measurement because they were ill. Secondly, multilevel regression model accounts for the non-independence among multiple responses over time for the same individual.

For each analysis, a separate model was run. All models included the fixed factors *L1*, indicating EB or LB and *Time,* indicating measurement 1, 2 and 3. In addition, the fixed factor *Gender* was added and wherever *Gender* turned out to be a significant predictor, it was kept in the model. If it was not a significant predictor, it was left out. Furthermore, different covariates were added, such as the influence of language contact on for example oral language proficiency. As with *Gender,* these covariates were only kept in the model if they turned out to be significant.

SES was not included as a fixed factor or covariate because, as described in section 3.2.1.4, the information was not available for all participants and as far as the information was available results showed that the division into EB and LB was in line with the division into low-medium SES (EB) and high SES (LB) and therefore also already accounted for.

3.5.2 Effect sizes

Effect sizes were used to measure the magnitude of significant results. For the chi-square test phi (φ) was used. This is a measure of association between nominal variables based on Pearson's chi-square. Phi is used when there are two categories per variable involved and is measured by dividing the chi-square value divided by the sample size (N) and the taking the square root of the result. Phi scores can be between -1 and +1.

For calculating the effect sizes of the mixed model analyses, Cohen's d_s was used. It measures the distance between two means in standard deviations. Since the mixed model analyses did not provide standard deviations but only standard errors, the effect sizes were calculated using pooled standard deviations. Cohen's d_s was calculated using the mean differences between scores on the different variables and dividing it by the pooled standard deviation. Table 16 gives an overview of how the results are interpreted.

Table 16. Interpretation of effect size scores.

Magnitude of Effect Size	Phi	Cohen's ds
Small	-.10 / .10	-.20 / .20
Medium	-.30 / .30	-.50 / .50
Large	-.50 / .50	-.80 / .80

The minus sign in phi and Cohen's d_s indicates the direction of the effect and simply depends on which variables are labelled X and Y. For example, if X and Y are compared an effect size of .45 implies that the mean of X is .45 SD higher than the mean of Y. If the effect size is -.45 it implies that the mean of X is -.45 SD lower than the mean of Y. Because of the order in which the analyses were done, in this dissertation, a negative effect always implied an effect in the direction of EB and a positive effect always implied an effect in the direction of LB.

3.6 Missing data

In total 77 participants participated in the study. 48 participants participated in measurement 1 and by adding a third school from measurement 2 onwards, 77 participants participated in measurement 2 and 3. Each measurement lasted for several weeks. Because of for example illness or personal circumstances it was not always possible for all participants to take part in all tests. Hence, this is why for each part of the study there is a small part of missing data, between 1.5% and 6.5%.

Chapter 4 - Socio-psychological factors

4.1 Introduction

The results of the extensive questionnaire that were described in chapter 3 showed differences in the language background, e.g. the language spoken at home with parents. Half of the participants spoke (mainly) Frisian at home and half of the participants spoke (mainly) Dutch at home. There were no differences in the other areas looked at, e.g. staying abroad and using English or English lessons at primary school. The aim of the current chapter is to further describe what characterises the participants in the Frisian context by zooming in on socio-psychological factors.

The focus point socio-psychological factors deals with the question whether EB and LB differ on a) the amount and quality of language contact, b) their attitudes and motivation towards languages and language learning and c) the development over time in the amount and quality of language contact and participants' attitudes and motivation towards languages and language learning. Besides the differentiation between EB and LB and development over time, gender was also taken into account in the analyses.

This chapter quantifies whether being an EB or LB influences a) how much one is exposed to the different languages (language contact), b) the speaker's language attitudes and motivation towards languages and language learning and includes the influence of the development over time. The purpose of this variable is to describe how language contact, language (learning) attitudes and motivation can change over the course of one school year. The focus of the chapter is on the three languages Frisian, Dutch and English with the emphasis on English since this language is the main focus of the whole dissertation.

By looking at all these different variables a very detailed description can be given of the participants. In the context of the dissertation this description will help to explain and interpret the results found in the other parts of the dissertation: the possible differences between the two groups in oral language proficiency and language processing (discussed in chapters 5 and 6 respectively).

4.2 Theoretical background

4.2.1 Language contact

Language contact in the case of the participants in this dissertation means the contact with languages inside and outside the school environment. The amount of language exposure is said to be of great influence on language development: the more exposure, the easier a language is learned. It is one of many factors that influence how a new language develops. De Bot, Lowie and Verspoor (2005) mention the type and amount of contact with a language as one of the factors that influence language development. Thomas and Roberts (2011) argue that language exposure is critical for L2 bilinguals. Kuiken (2002) also mentions contact with the target language as an important factor in language learning. How much one is able to use the L2 (or as in this dissertation the L3) can influence the speed of language development. The more exposure of and interaction in the target language the faster and more effective it will be learned (Kuiken, 2002). In areas where minority and majority language communities live together, *linguistic self-confidence* is a major motivational factor in learning languages (Dörnyei, 2005). Dörnyei (2005, p. 73) describes *linguistic self-confidence* as "the quality and quantity of the *contact* between the members of L1 and L2 communities". The *linguistic self-confidence* construct can also be applied to foreign language learning, like in the case of the L3 in the current study. Clément, Dörnyei and Noels (1994) state that *linguistic self-confidence* plays a role in foreign language learning. There might be little direct contact with members of the foreign language community but there can be considerable indirect contact with the foreign language culture through media such as the Internet (Dörnyei, 2005).

In Frisian education, the exposure to Dutch and English increases and the exposure to Frisian decreases when pupils go to secondary school. As described in section 1.3.1, Dutch is the language in which most lessons are taught in secondary school and it is taught as a subject for 3 hours per week. English is in general taught for 2 to 4 hours a week and Frisian is only taught for 1 hour per week. Outside school the exposure to the three languages differs. As mentioned in section 1.1 Frisian is mostly used in social contexts like at home with family and friends. Frisian television and radio do exist but might not always be appealing to Frisian young adolescents. The exposure to Dutch is substantial through the environment, television and the Internet (Arocena Egaña et al., 2010). The outside school exposure to English is also substantial and is still increasing through for example television, Internet and games (Arocena Egaña et al., 2010).

One of the goals of the current study is to find out whether EB and LB are similarly or differently exposed to languages inside and especially outside school. EB might be less exposed to Dutch and English because they speak Frisian at home

and LB might not be exposed to Frisian at all at home. Besides L1, the influence of time and gender is also taken into account when discussing the amount and quality of language contact.

4.2.2 Attitudes and motivation towards languages and language learning

Different studies have shown that successful language development is very much influenced by the attitude and motivation towards it (Lightbown & Spada, 1999). Gardner and Lambert (1972) believed motivation could be *integrative* - language learning for personal growth and enrichment and/or *instrumental* - language learning for immediate and practical goals. Both types were viewed as important for successful language learning and go hand in hand. If a language learner's internal motivation is only minimal, attitudes towards language learning might be negative (Lightbown & Spada, 1999). And if a language learner's internal motivation is high, language learning attitudes are naturally assumed to be more positive.

The latest development of motivation research shows a shift to the role of the *self* in language learning attitudes and motivation. Dörnyei (2005) developed the *L2 Motivational Self System*. The system consists of three dimensions - two possible selves and the learning experience - that describe how one can be motivated towards successful L2 learning. The three components are:

- *Ideal L2 self*: referring to the L2 speaker a learner wishes to become
- *Ought-to L2 self*: referring to the qualities and characteristics one needs to be a successful L2 learner
- *L2 learning experience*: referring to specific motives that are related to the immediate learning environment of the L2 learner

The first component, the *ideal L2 self*, refers to the intrinsic motivation. As Lasagabaster (2016, p. 316) describes it, it "generates motivation which reduces the discrepancy between our actual and our ideal selves". The second component, the *ought-to L2 self*, refers to the extrinsic motivation. According to Hamilton and Serrano (2014, p. 4) it "represents traits to avoid and norms to obey". Dörnyei (2005, p. 98) indicates the two *possible selves* as the most powerful motivational self-mechanism, "representing the individuals' ideas of what they might become, what they would like to become, and what they are afraid of becoming". Dörnyei (2009) views the imaginary component of his *L2 Motivational Self System* as the most powerful motivational tool. Language learning can be a difficult and long process, which challenges the language learner's perseverance and calls for imaginary motivation. According to Dörnyei (2009, p. 25) language learners' success can be attributed to "their possession of a superordinate vision that keeps them on track" which is what the *L2 Motivational Self System* can provide. The third and final component, the

L2 learning experience, refers to the learning environment of the L2 learner. By this for example the impact of the teacher, attitudes of classmates, teaching materials and also successful learning experiences is meant (Dörnyei, 2009; Lasagabaster, 2016).

Several studies have looked at the relationship between the *L2 Motivational Self System* and language learning and taken different variables into account, for example the L1. Social factors such as one's community's attitude towards a language can play a major role in language learning, especially when minority languages are involved. Members of the different language groups - majority and minority - might have very different attitudes and motivation towards a certain language and language learning (Lightbown & Spada, 1999). Lasagabaster (2016, p. 318) argues that "there is a close relationship between the desire to recover the minority language and students' motivation to learn English as an L3, which consequently may have an impact on their *ideal* and *ought-to selves*". Several studies have shown that speaker's L1 can influence how one thinks about the other languages spoken in their environment. In a study by Lasagabaster (2001) Basque speaking university students were not only less positive about the majority language Spanish but also less positive about the foreign language English, compared to their Spanish-speaking peers. Lasagabaster (2005, p. 28) argues that Basque minority speakers might be "afraid of the presence of such powerful and ethnolinguistically vital languages". A study by Cenoz (2001) also showed that Basque secondary school pupils had a more positive attitude towards their minority language Basque than to the majority and foreign languages Spanish and English. Back to the Frisian context, in 2006 the Dutch Inspectorate of Education asked Frisian secondary school pupils about their attitudes and motivation towards Frisian language learning. 52% rated Frisian as not important and were not motivated to learn the language, 41% indicated Frisian as slightly important and had a neutral motivation to learn the language and finally, 7% indicated Frisian as very important and were eager to learn the language (Inspectie van het Onderwijs, 2006). In the same report a general remark was made about secondary school pupils valuing Dutch and especially English much higher than Frisian. A European report, edited by Bonnet (2004), showed that Dutch secondary school pupils valued English as beautiful and important. The advantages of learning English were to be able to communicate outside the Netherlands, being able to understand television and computer programmes better and provide better future career opportunities. In this report, the province of Fryslân is not mentioned separately, so it can only be assumed that the same conclusions count for Fryslân's inhabitants. Several studies concerning the L1 and language learning motivation and attitudes were undertaken in the Frisian context. Benedictus (2005) looked at teacher-training students' language

learning attitudes and found that L1 Frisian students were more positive towards the Frisian language than L1 Dutch students. Benedictus (2005) also found that L1 Frisian students were more positive towards trilingualism than their L1 Dutch peers, hence they were more positive towards English than their Dutch peers. Unlike Benedictus (2005), Ytsma (2007) found that L1 Frisian speakers at HBO-level were less positive towards the foreign language English than their L1 Dutch peers. They were more positive towards Frisian though compared to their L1 Dutch peers who in turn were more positive about the Dutch language. On the other hand, a study by de Vries (2012) showed that Frisian secondary school pupils were the least positive about the Frisian language and most positive about the English language. However, in this study 60% of the participants had Dutch as their L1 and this most likely influenced the results. Although the direction of the outcomes was different, what the above studies have in common is that they show that the L1 can exert an influence on motivation and attitudes towards language learning.

Other studies have focused on the relationship between *L2 Motivational Self System* and gender. Ryan (2009) studied secondary school pupils and non-English and English university major students. Results showed that females were more motivated on *ideal L2 self*, integrativeness and intended learning effort, especially at university level and among non-English university majors. Heras and Lasagabaster (2015) studied English-medium instruction (EMI) secondary school pupils on their language learning attitudes and motivation. They found that boys scored higher on the *ought-to L2 self* component, implying a higher extrinsic motivation than girls, but they did not find gender differences on the *ideal L2 self* component. Lasagabaster (2016) studied the interaction between motivation, gender, L1 and possible selves with Basque/Spanish university students that were enrolled in EMI programmes in which English was the L3. Results showed that the L1, gender and *ought-to L2 self* did not exert significant influence on students' intended learning effort whereas student's *ideal L2 self*, the influence of their family and their attitudes to EMI best predicted their intended learning effort (Lasagabaster, 2016).

Besides the individual's intrinsic and extrinsic motivation, students are very much influenced by their cultural backgrounds (Cook, 1996), which can be viewed as part of the *L2 learning experience* component of the *L2 Motivational Self System*. Dörnyei (2005, p. 76) points out that active learners have more positive attitudes towards language learning: "being actively engaged in learning a foreign language in school enhances language attitudes and motivation". The role of the teacher/school is thus very important, especially in the case of our participants, first year secondary school pupils. Noels, Clément and Pelletier (2001) found that students were less intrinsically motivated if they perceived their teachers as controlling and

not providing instructive feedback. Language teachers can face a tough job changing students' thoughts on language learning since the students' motivations to learn a language can be "deep-rooted in the students' minds and in their cultural backgrounds" (Cook, 1996, p. 99). Gardner (2007) also believes that the educational context is important and that it plays a role in students' motivations. He refers to several aspects of the educational context such as the teacher, the materials and the class atmosphere, which can influence students' motivation.

Another factor affecting language attitude might be age. Gorter and Ytsma (1988) found that young adults had a less positive language attitude towards the Frisian language than older people, implying that attitudes towards the Frisian language were related to age. Adolescents are self-conscious and therefore might not dare to take a lot of risk in language learning (Lightbown & Spada, 1999; Johnson, 2001).

Motivation and attitude go hand in hand. If a language learner has a positive attitude towards the target language and its culture the language learner will be more easily motivated to learn the language (Kuiken, 2002). In the current study EB and LB are compared on their language attitudes and motivation towards Frisian, Dutch and English and language learning in general. As mentioned in section 2.3, EB and LB might especially differ on their motivation and attitude towards the Frisian language due to its lower status compared to Dutch and English. Furthermore, the possible changes in participants' motivation and attitudes over the period of one school year is studied.

4.2.3 Development over time

During the school year in which the participants were followed, the amount of language contact and the direction of their attitudes and motivation towards languages and language learning might change. This was especially expected since the participants underwent the transition from primary to secondary school. This transition, amongst other things, implies changes in the teaching environment, the language use and exposure but also changes in friends and activities.

First of all, a change in language contact could be the language lessons participants receive at secondary school and the language of instruction. For example, the exposure to Frisian might decrease and the exposure to English might increase because Frisian is used less and more attention is paid to English at secondary school compared to primary school. Also, their activities in which language is involved might change, for example they might spend more time using the Internet compared to when they attended primary school.

Secondly, attitudes and motivation towards languages and language learning appear to change during the school year (Koizumi & Matsuo, 1993). Dörnyei

and Ryan (2015) view motivation as dynamic in character and can have "*temporal variation*" (p. 84), something that can vary from moment to moment in time. As Dörnyei (2005) quotes Garcia (1999, p. 231) "motivation ebbs and flows". Not only within for example a school year but even in one language lesson (Dörnyei & Ryan, 2015). A study by Koizumi and Matsuo (1993) provides an example of this. They followed Japanese students learning English for a 7-month period and found that there was a decrease in motivation after 7 months as the students started to change their goals into more realistic ones.

4.3 Hypotheses

The previous sections indicate that describing the participants' characteristics in detail is a challenging task. Partly because the factors strongly interact with each other and have the tendency to change over time, as was explained above. This dissertation takes a different approach than other studies. First of all, not only L1 but also gender is taken into account. Secondly, language contact, language attitudes and motivation are taken into account. Lastly, the development over time is taken into account.

The preceding sections have explored a number of factors that have previously been shown to influence language learning. Based on these theories and studies, the following hypotheses were formulated:

1) **Language contact:**
    a. EB are more exposed to Frisian and LB are more exposed to Dutch at home. EB and LB are similarly exposed to English at home.
    b. Differences between boys and girls in language related activities: boys spent more time watching TV than girls.
    c. During the school year contact with English grows and contact with Frisian declines.
2) **Language attitudes and motivation:**
    a. EB have a more positive attitude and motivation towards Frisian and EB and LB have an equal positive attitude and motivation towards Dutch and English.
    b. EB enjoy language learning more and find it easier to learn languages compared to LB.
    c. Girls are more motivated and find it easier to learn languages than boys.
    d. Attitude and motivation towards languages and language learning increase during the school year.

4.4 Method

4.4.1 Participants

The participants were 34 EB and 43 LB, as described in chapter 3, sections 3.1 and 3.2.

4.4.2 Materials and procedures

The materials and procedures are discussed in chapter 3, section 3.3.2.

4.4.3 Statistical analysis

In total, there were 198 participant and 65 parent questionnaires. The data was all entered in SPSS and different analyses were carried out. First of all, a chi-square test was used for some of the questions, making comparisons between EB and LB and taking into account the development over time. For other questions a multilevel regression model was used with the fixed factors: *L1 (EB or LB)* and *Time (measurement 1, 2 and 3)*. If it turned out to be significant predictor, *Gender* was also included as a fixed factor. Effect sizes were calculated using Phi (chi-square) and Cohen's d_s (multilevel regression models).

4.5 Results

The participants of the third school only filled in the questionnaires used in measurement 1 and 3. Although the school joined from measurement 2 onwards, questionnaire 1 was used instead of questionnaire 2 because questionnaire 1 included the general questions about language background and environment. In doing so, those questions that were only used in measurement 1 were administered 3 to 4 months later than for the other two schools since the third school filled in this questionnaire later. The answers to the questions that were repeated in every measurement were moved from measurement 1 to measurement 2 for the third school to stay on the same timeline as the other two schools. The results discussed in this chapter do not go into individual differences but only provide group results. The amount and quality of language contact and attitudes and motivation towards languages and language learning are discussed and comparisons are made between EB and LB, taking gender and development over time into account.

4.5.1 Language contact

This section discusses the first research question, whether being an EB or LB influences how much one is exposed to the different languages and whether there is an influence of development over time. The amount and quality of language contact that EB and LB had was measured by four questions in the participant questionnaire and one question in the parent questionnaire.

4.5.1.1 Reading, watching TV/DVD, listening to music and using the Internet - participants

The participants were asked in which language(s) they read, watched TV/DVD, listened to music and used the Internet. The question was asked in measurements 1 and 3. Table 1 shows EB's and LB's responses for both measurements together with the results of the chi-square test.

Table 1. Reading, watching TV/DVD, listening to music and using the Internet in which language(s) by participants (N=77).

	Reading							
	Time 1				Time 3			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	9 (27%)	2 (5%)	7.15 (1)	.007*	3 (9%)	0 (0%)	3.50 (1)	.061
Dutch	32 (94%)	41 (98%)	0.61 (1)	.436	32 (94%)	38 (100%)	2.30 (1)	.129
English	1 (3%)	0 (0%)	1.25 (1)	.263	3 (9%)	6 (16%)	0.80 (1)	.372
	Watching TV/DVD							
	Time 1				Time 3			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	4 (12%)	2 (5%)	1.27 (1)	.260	3 (9%)	0 (0%)	3.50 (1)	.061
Dutch	28 (82%)	32 (76%)	0.43 (1)	.512	28 (82%)	28 (74%)	0.78 (1)	.377
English	20 (59%)	34 (81%)	4.47 (1)	.034*	26 (77%)	32 (84%)	0.69 (1)	.407
	Listening to music							
	Time 1				Time 3			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	3 (9%)	0 (0%)	3.98 (1)	.046*	3 (9%)	0 (0%)	3.41 (1)	.065
Dutch	18 (55%)	10 (24%)	7.46 (1)	.006*	11 (32%)	9 (24%)	0.56 (1)	.452
English	29 (88%)	41 (98%)	2.82 (1)	.093	32 (94%)	36 (97%)	0.44 (1)	.506
	Using the Internet							
	Time 1				Time 3			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	5 (15%)	0 (0%)	6.46 (1)	.011*	3 (9%)	0 (0%)	3.23 (1)	.072
Dutch	30 (88%)	38 (93%)	0.43 (1)	.510	28 (82%)	34 (97%)	4.14 (1)	.042*
English	10 (29%)	13 (32%)	0.05 (1)	.830	10 (29%)	16 (46%)	1.95 (1)	.162

χ^2 = Chi-square value, (df) = degrees of freedom, p = significance level, * = significant result

The results in table 1 show that both EB and LB mostly read in Dutch. The chi-square results show that Frisian is read by significantly more EB than LB in measurement 1 but not in measurement 3. The effect size for measurement 1 as calculated by phi (φ) is .31, which suggests a medium size effect. Both groups watch TV and DVD mostly in Dutch and English. LB watch significantly more English TV and DVD than EB in measurement 1 but not in measurement 3. The effect size is small at φ = .24. Both groups of participants mostly listen to music in English and there are no differences between EB and LB. Just three EB listen to Frisian music compared to none of the LB, which is a significant difference for measurement 1, with a small effect size of φ = .23, but not for measurement 3. Also, significantly more EB than LB listen to Dutch music in measurement 1, with a medium effect size of φ = .32 but there is no difference between the two groups in measurement 3. This is due to a big drop in the number of EB participants listening to Dutch music between measurement 1 and 3: from 18 to 11 participants. When using the Internet, participants mostly use the Dutch language or a combination of Dutch and English. Significantly more EB than LB use Frisian Internet in measurement 1, with a small effect size of φ = .29 but not in measurement 3 and only 5 (time 1) and 3 (time 3) out of 34 EB use it. Finally, significantly more EB than LB use Dutch Internet in measurement 3 but not in measurement 1. The effect size is φ = .25, which is small. There are no differences between EB and LB in using the English language for the Internet.

4.5.1.2 Reading, watching TV/DVD, listening to music and using the Internet - parents

In the parent questionnaire parents were asked to indicate in which language(s) they watched TV/movies, in which language(s) they listened to music/radio and in which language(s) they read. The numbers shown in table 2 represent the number of times parents indicated which language(s) they used for the different activities. First the answers filled in by the fathers are discussed, followed by the answers given by the mothers.

Table 2. Which language(s) used in different activities by fathers (N=65).

	Watching TV-programmes				Watching DVD/movies			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	26 (87%)	19 (63%)	4.36 (1)	.037*	8 (27%)	4 (13%)	1.67 (1)	.197
Dutch	30 (100%)	30 (100%)	-	-	28 (93%)	29 (97%)	.35 (1)	.554
English	25 (86%)	28 (93%)	0.82 (1)	.365	24 (80%)	28 (93%)	2.31 (1)	.129
	Listening to Music				Listening to radio programmes			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	17 (57%)	7 (24%)	6.47 (1)	.011*	19 (63%)	11 (37%)	4.27 (1)	.039*
Dutch	25 (83%)	27 (90%)	0.58 (1)	.448	30 (100%)	30 (100%)	-	-
English	29 (97%)	29 (97%)	0.00 (1)	1.00	1 (3%)	14 (47%)	15.02 (1)	.000*
	Reading books				Reading newspapers			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	2 (7%)	2 (7%)	0.00 (1)	.972	9 (30%)	4 (13%)	2.46 (1)	.117
Dutch	26 (87%)	29 (97%)	1.96 (1)	.161	30 (100%)	29 (97%)	1.02 (1)	.313
English	1 (3%)	10 (35%)	9.43 (1)	.002*	0 (0%)	6 (21%)	6.91 (1)	.009*
	Reading magazines							
Languages	EB	LB	χ^2 (df)	*p*				
Frisian	2 (7%)	2 (7%)	0.00 (1)	1.00				
Dutch	28 (93%)	29 (97%)	0.35 (1)	.554				
English	0 (0%)	9 (30%)	10.59 (1)	.001*				

χ^2 = Chi-square value, (df) = degrees of freedom, *p* = significance level, * = significant result

Table 2 shows that more EB than LB fathers watched Frisian television. The effect size was small at φ = -.27. There were no differences between watching Dutch and English television nor watching Frisian, Dutch or English movies. It has to be noted though that there are only a few Frisian movies available so there is little opportunity to watch Frisian movies. When it came to listening to music and radio there were also differences. More EB than LB fathers listened to Frisian music, with a medium effect size of φ = -.33, and radio, with a small effect size of φ = -.27 There were no differences between EB and LB fathers when it came to listening to Dutch music and radio nor listening to English music. There was a difference in listening to English radio. More LB fathers than EB fathers listened to English radio. The effect size was large at φ = .50. When it came to reading books, there were no differences in reading Frisian books, magazines or newspapers. Only two EB and two LB fathers read Frisian books and magazines and a few more read Frisian newspapers

(EB: 9 vs. LB: 4). EB and LB fathers also did not differ in reading Dutch books, magazines or newspapers. They did however differ in reading English books, magazines or newspapers. More LB than EB fathers read English books (medium effect size φ = .40), English newspapers (medium effect size φ = .34) and English magazines (medium effect size φ = .42). In fact, only one EB father read English books but none of the EB fathers read English magazines or newspaper.

Table 3. Which language(s) used in different activities by mothers (N=65).

	Watching TV-programmes				Watching DVD/movies			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	28 (93%)	25 (74%)	4.39 (1)	.036*	9 (29%)	4 (12%)	3.02 (1)	.082
Dutch	31 (100%)	34 (100%)	-	-	30 (97%)	33 (97%)	0.01 (1)	.947
English	26 (84%)	31 (91%)	0.80 (1)	.371	25 (81%)	31 (91%)	1.51 (1)	.220
	Listening to Music				Listening to radio programmes			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	17 (55%)	7 (21%)	8.17 (1)	.004*	20 (65%)	14 (42%)	3.13 (1)	.077
Dutch	28 (90%)	29 (85%)	0.38 (1)	.538	28 (90%)	34 (100%)	3.45 (1)	.063
English	29 (94%)	30 (88%)	0.55 (1)	.460	5 (16%)	11 (32%)	2.30 (1)	.129
	Reading books				Reading newspapers			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	14 (45%)	3 (9%)	10.66 (1)	.001*	13 (42%)	5 (15%)	6.00 (1)	.014*
Dutch	31 (100%)	34 (100%)	-	-	30 (97%)	33 (97%)	0.01 (1)	.947
English	2 (7%)	6 (18%)	1.88 (1)	.170	0 (0%)	3 (9%)	2.87 (1)	.090
	Reading magazines							
Languages	EB	LB	χ^2 (df)	*p*				
Frisian	7 (23%)	1 (3%)	5.80 (1)	.016*				
Dutch	30 (97%)	33 (97%)	0.01 (1)	.947				
English	1 (3%)	4 (12%)	1.67 (1)	.197				

χ^2 = Chi-square value, (df) = degrees of freedom, p = significance level, * = significant result

Table 3 shows that more EB than LB mothers watched Frisian television. The effect size was small at φ = -.26. There were no differences between watching Dutch and English television nor watching Frisian, Dutch or English movies. Again, it has to be noted that there are almost no Frisian movies available. When it came to listening to music and radio there were differences in listening to Frisian music and radio. More EB mothers listened to Frisian music (medium effect size of φ = -.35) but

not to Frisian radio compared to LB mothers. There were no differences between EB and LB mothers in listening to Dutch and English music and radio. Looking at reading books, magazines and newspapers differences were found for Frisian. More EB than LB mothers read Frisian books (medium effect size of φ = -.41), Frisian newspapers (small effect size of φ = -.30) and Frisian magazines (medium effect size of φ = -.30). There were no differences between EB and LB mothers in reading Dutch and English books, magazines and newspapers. English was not read a lot by both groups and not as much as by the LB fathers.

Table 4. Which language(s) used in different activities by participants according to their parents (N=65).

	Watching TV-programmes				Watching DVD/movies			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	23 (74%)	9 (27%)	14.78 (1)	.000*	5 (16%)	4 (12%)	0.26 (1)	.611
Dutch	31 (100%)	34 (100%)	-	-	30 (97%)	31 (91%)	0.88 (1)	.348
English	25 (81%)	30 (88%)	.72 (1)	.397	23 (74%)	32 (94%)	4.95 (1)	.026*
	Listening to Music				Listening to radio programmes			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	10 (32%)	2 (6%)	7.49 (1)	.006*	11 (36%)	3 (9%)	6.82 (1)	.009*
Dutch	27 (87%)	29 (85%)	0.04 (1)	.834	31 (100%)	32 (94%)	1.88 (1)	.170
English	31 (100%)	32 (94%)	1.88 (1)	.170	4 (13%)	6 (18%)	0.28 (1)	.596
	Reading books				Reading newspapers			
Languages	EB	LB	χ^2 (df)	*p*	EB	LB	χ^2 (df)	*p*
Frisian	3 (10%)	1 (3%)	1.27 (1)	.259	1 (3%)	1 (3%)	0.01 (1)	.947
Dutch	31 (100%)	34 (100%)	-	-	23 (74%)	27 (79%)	0.25 (1)	.618
English	0 (0%)	6 (18%)	6.03 (1)	.014*	0 (0%)	1 (3%)	0.93 (1)	.336
	Reading magazines							
Languages	EB	LB	χ^2 (df)	*p*				
Frisian	1 (3%)	0 (0%)	1.11 (1)	.291				
Dutch	27 (87%)	32 (94%)	0.95 (1)	.329				
English	0 (0%)	1 (3%)	0.93 (1)	.336				

χ^2 = Chi-square value, (df) = degrees of freedom, p = significance level, * = significant result

Parents were also asked which languages their children used for the different activities. Table 4 shows the number of times a language was used. The results shown in table 4 were slightly different compared to the results that were collected of the

participants as shown in table 1. The parents indicated that more EB than LB children watched Frisian television. The effect size was medium at φ = -.48. There were no differences in watching Frisian movies, but this is most probably due to the lack of Frisian movies. There were also no differences in watching Dutch television and movies and English television. There was a difference in watching English movies. Parents indicated that more LB than EB watched English movies (small effect size φ = .28). There were no differences in listening to Dutch and English music and radio but parents indicated more EB than LB listened to Frisian music (medium effect size φ = -.34) and radio (medium effect size φ = -.32). The parents furthermore indicated their children read almost no Frisian books, magazines and newspapers. The participants read mostly in Dutch (books, magazines and newspapers) but there were no differences between EB and LB. Furthermore, parents indicated that EB did not read English at home at all. Of the LB only one participant read English magazines and newspapers and 18% of LB read English books compared to none of the EB, which was a significant difference with a medium effect size φ = .31.

4.5.1.3 Amount of time spent on different activities

In addition to the question what language(s) the participants used for different activities, the participants were asked how much time was spent on each activity, in hours per day and per week. Again, this was measured during measurement 1 and 3.

Results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors. The fixed factor *Gender* turned out to be significant and it was therefore also included. The results are shown in tables 5 and 6.

Table 5. Amount of time spent on different activities by L1 (N=77).

		Time 1			Time 3		
Activity	Group	N	Mean	SD	N	Mean	SD
Reading in language hours per day	EB	33	2.91	2.72	34	1.43	1.42
	LB	39	1.71	1.45	36	1.15	1.06
Reading in language hours per week	EB	34	17.28	16.01	33	8.55	7.50
	LB	40	11.26	9.58	36	7.14	6.27
TV/DVD in language hours per day	EB	34	1.87	1.29	32	2.01	1.36
	LB	42	1.93	1.59	38	1.72	1.17
TV/DVD in language hours per week	EB	34	13.38	9.61	33	13.64	10.25
	LB	41	13.20	11.70	36	10.76	7.25

Music in language hours per day	EB	33	1.73	1.81	33	1.72	1.40
	LB	42	1.71	1.43	35	2.18	1.46
Music in language hours per week	EB	33	11.91	12.73	33	12.27	10.35
	LB	41	10.92	9.96	35	13.16	8.60
Internet in language hours per day	EB	33	1.82	1.46	33	2.07	2.05
	LB	41	1.56	1.38	34	1.80	1.01
Internet in language hours per week	EB	33	12.82	10.55	33	12.85	12.31
	LB	40	10.26	8.90	33	12.01	7.26

Table 6. Multilevel regression model - Amount of time spent on different activities.

Amount of time spent on different activities	Reading		Watching TV/DVD		Listening to music		Using the Internet	
Hours per day	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	74.56 (118.23)	.000*	74.16 (198.62)	.000*	73.55 (157.30)	.000*	73.68 (122.19)	.000*
L1	74.26 (4.18)	.044*	74.16 (0.29)	.591	73.19 (0.65)	.423	73.53 (0.25)	.621
Time	73.46 (16.47)	.000*	72.71 (.05)	.830	71.19 (1.15)	.287	67.37 (2.30)	.134
L1 * Time	73.48 (2.96)	.089	72.71 (1.01)	.319	71.19 (1.21)	.274	67.35 (0.01)	.907
Gender	74.94 (6.05)	.016*	74.30 (0.22)	.643	74.05 (0.01)	.911	73.87 (2.10)	.151
Hours per week	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	73.86 (120.77)	.000*	70.41 (165.48)	.000*	71.99 (150.33)	.000*	73.53 (125.97)	.000*
L1	73.22 (2.48)	.120	70.65 (0.58)	.451	71.96 (0.01)	.914	73.32 (0.16)	.688
Time	72.09 (19.45)	.000*	67.77 (0.60)	.441	70.28 (0.61)	.613	66.08 (0.81)	.370
L1 * Time	72.11 (2.30)	.134	67.78 (0.79)	.379	70.28 (0.31)	.583	66.10 (1.04)	.311
Gender	74.30 (6.04)	.016*	71.06 (0.23)	.635	72.83 (0.15)	.698	73.79 (2.50)	.118

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The results in table 6 show that the main factor *L1* was significant only for reading in hours per day. The effect size between EB and LB, calculated using Cohen's d_s, was small at d = .12. This means that although EB read significantly more hours per day than LB the effect was small. In other words, the difference between EB and LB in number of hours spent on reading per day was not really relevant. *Time* was a significant factor for reading in hours per day and per week. As can be seen in table 5, there was a huge drop in the number of hours spent on reading by both groups

from measurement 1 to 3, both per day and per week. The average number of hours per day spent on reading dropped from 2.91 to 1.43 for EB and from 1.71 to 1.15 for LB. The average number of hours per week spent on reading dropped from 17.28 to 8.55 for EB and from 11.26 to 7.14 for LB. The standard deviations in table 5 show that a lot of participants did not read much and a few read a lot. This is also illustrated by the median which for EB is 1.3 and 1.0 for hours per day and 7.0 and again 7.0 hours per week for measurement 1 and 3 respectively. For LB, this is 1.0 and again 1.0 for hours per day and 7.0 and 5.5 hours per week for measurement 1 and 3 respectively. The effect sizes for *Time,* calculated using Cohen's d_s were small at d = .35 for reading in hours per day and small at d = .43 for reading in hours per week. Finally, *Gender* was significant for reading in hours per day and per week. The results in table 5 show that girls read more than boys. The effect sizes were however small for both reading per day d = -.46 and reading per week d = -.47.

The results in tables 5 and 6 further show that although there were differences between EB and LB on the amount of time spent on watching TV/DVD, listening to music and using the Internet, both in hours per day and per week, these were non-significant. Also, *Time* nor *Gender* were significant factors.

4.5.1.4 Amount of contact with English

Participants were asked how often they came into contact with English through 13 different items/categories. A 4-point scale from 'never' to 'very often' was used to indicate how often they came into contact with each of the categories. The question was repeated in every measurement. To achieve internal consistency two items had to be removed after which a Cronbach's alpha of .721 was reached. A principal component analysis (PCA) was used to investigate the internal structure of the 11 remaining items that constitute the scale. The PCA resulted in three components (factors) for which the eigen values were bigger than 1, being: contact with English through digital media, contact with English through printed media and contact with English through persons. Initial eigenvalues indicated that these three factors explained a total of 55% (28%, 16.5%, and 10.5% respectively) of the variance. After varimax rotation the three-factor solution was deemed the most interpretable. For each of the three components the total scores were calculated and used as a dependent variable in the analyses.

Results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors. *Gender* was left out as a covariate since it was not a significant predictor.

Table 7. Amount of contact with English (N=77).

		Time 1			Time 2			Time 3		
Type of contact	Group	N	Mean	SD	N	Mean	SD	N	Mean	SD
Contact with English through digital media	EB	22	3.16	0.43	34	3.14	0.64	34	3.20	0.55
	LB	23	3.17	0.58	43	3.23	0.51	38	3.18	0.51
Contact with English through printed media	EB	22	1.58	0.50	34	1.58	0.64	34	1.74	0.78
	LB	23	1.45	0.41	43	1.50	0.53	39	1.40	0.47
Contact with English through persons	EB	21	1.60	0.68	34	1.84	0.59	34	1.83	0.67
	LB	22	1.53	0.48	43	1.57	0.42	38	1.41	0.46

Table 8. Multilevel regression model - Amount of contact with English.

Amount of contact with English	Contact digital media		Contact printed media		Contact persons	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	75.62 (4047.46)	.000*	74.34 (909.27)	.000*	80.69 (1080.98)	.000*
L1	75.62 (0.00)	.989	74.34 (3.75)	.057	80.69 (7.12)	.009*
Time	121.54 (0.74)	.737	122.04 (0.28)	.756	124.81 (1.43)	.243
L1 * Time	121.54 (0.59)	.589	122.04 (1.22)	.300	124.81 (1.55)	.217

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The results in tables 7 and 8 show that the participants had contact with English often to very often through contact with digital media. They never to sometimes came into contact with English through printed media and through persons. The analysis showed that the main factor *L1* was significant only for contact with English through persons. The effect size was medium at *d* = .75. EB came into contact with English through persons more often than LB with an average over the three measurements of 1.76 for EB against 1.50 for LB. The main factor *Time* was not significant for any of the three categories, which implies that the amount of contact with English stayed stable during the school year.

4.5.1.5 Language(s) used by English teacher in English lessons

The participants were asked how much English was used by their English teacher at their current school. This was asked during all three measurements. What stands out from table 9 is that LB indicated that more English than Dutch was used by their English teacher while EB indicated that their English teacher used more Dutch than English.

A chi-square test showed that this difference was significant for the first and second measurement, as can be seen in table 9.

Table 9. Languages used in class by English teacher by L1 (N=77).

	Time 1				Time 2				Time 3			
	EB	LB	X^2 (df)	*p*	EB	LB	X^2 (df)	*p*	EB	LB	X^2 (df)	*p*
only English	3 (14%)	3 (13%)			0 (0%)	1 (2%)			0 (0%)	1 (3%)		
more English than Dutch	4 (19%)	17 (71%)			6 (18%)	20 (47%)			9 (27%)	14 (19%)		
same amount of English and Dutch	2 (10%)	0 (0%)			5 (15%)	11 (26%)			7 (21%)	12 (32%)		
more Dutch than English	8 (38%)	3 (13%)	17.20 (6)	.009*	22 (67%)	10 (23%)	15.24 (6)	.004*	16 (47%)	11 (29%)	6.13 (6)	.294
only Dutch	0 (0%)	1 (4%)			0 (0%)	1 (2%)			1 (3%)	0 (0%)		
Frisian + Dutch + English	3 14%)	0 (0%)			0 (0%)	0 (0%)			1 (3%)	0 (0%)		
English + Frisian	1 (5%)	0 (0%)			0 (0%)	0 (0%)			0 (0%)	0 (0%)		

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The effect sizes were large for measurements 1 (φ = .62) and medium for measurement 2 (φ = .45). At the third measurement, the difference disappeared. Taking a closer look at the data and looking at the differences between the schools, it turned out that the English teachers at the village school and the smaller city school used more Dutch than English in their lessons while the English teacher at the city school used more English than Dutch in the lessons. The distribution of the participants was such that there were more LB at the city school and more EB at the village and smaller city schools, which explain the differences in table 9.

4.5.1.6 Main conclusions language contact

This part of the focus point socio-psychological factors dealt with the question whether EB and LB differ on the amount and quality of language contact and the development over time in it. Gender was taken into account wherever it improved the multilevel regression model. Different expectations were formulated.

First of all, it was expected that EB are more exposed to Frisian and LB are more exposed to Dutch at home and EB and LB are similarly exposed to English at home.

This expectation is partly met. When comparing EB and LB the main difference lies in the use of Frisian for the four mentioned activities: reading, watching TV/DVD, listening to music and using the Internet. Results show that more EB than LB use Frisian for reading, listening to music and using the Internet in measurement 1. Also, more EB than LB use Dutch for Internet in measurement 3. When it comes to English, more LB than EB watch English TV/DVD in measurement 1. There are also differences in the use of language(s) for the different activities between EB and LB parents, which influences how much the participants are exposed to the languages at home. On the whole, more EB than LB are exposed to Frisian at home and more LB than EB are exposed to English at home, which is slightly different than what was expected. More EB than LB fathers and mothers use Frisian for watching television, listening to music, radio (only fathers) and for reading books, magazines and newspapers (only mothers). More LB fathers use English for listening to the radio and reading books, magazines and newspapers compared to EB fathers. The parents furthermore indicate that more EB participants than LB participants watch Frisian television and more LB than EB participants watch English movies. The time spent on the different activities does not differ between EB and LB participants, except for reading in measurement 1, which more EB do. Furthermore, EB come into contact with English through persons more often than LB. The hypothesis that EB are more exposed to Frisian at home can be confirmed. However, LB and EB are similarly exposed to Dutch at home and LB are more exposed to English at home than EB, both of which were not in line with the hypotheses. Finally, there are differences in the exposure to languages inside school and differences between the English lessons of EB and LB. Looking at how much language contact the participants have at school through their English lessons, results show that the English teachers of the EB use more Dutch than English in their lessons whilst the English teachers of the LB use more English than Dutch in their lessons in measurements 1 and 2.

Secondly, differences were expected in the amount of time that boys and girls spent on language related activities. For example, boys were expected to spend more time watching TV/DVD than girls. Indeed, gender is of influence in the amount of time spent on different activities. Girls spend more time on reading per day and per week. However, girls as well as boys show a drop of around 50% in the amount of time spend on reading from measurement 1 to 3. There are no differences in the amount of time spend on watching TV/DVD nor are there gender differences in the amount of time spend on listening to music or using the Internet.

Finally, the third expectation was that during the school year contact with English would grow and contact with Frisian would decline but this is not confirmed. The amount of contact with English through the English lessons stays mostly stable

throughout the school year. The amount of contact with Frisian at school is minimal the whole school year. The amount of language contact shown through the amount of time spent on reading, watching TV/DVD, listening to music and using the Internet only slightly fluctuates for both EB and LB during the school year. Both groups read fewer hours per week from measurement 1 to 3. LB watch fewer hours of TV/DVD from measurement 1 to 3. They spend more time per week on listening to music and using the Internet from measurement 1 to 3. EB on the other hand spend about the same amount of time on these three activities throughout the school year.

4.5.2 Attitudes and motivation towards languages and language learning

This section discusses the second research question whether being an EB or LB influences the speaker's language attitudes and motivation towards languages and language learning, including the influence of the development over time. Attitudes and motivation towards languages and language learning was measured by two questions in the participant questionnaire.

4.5.2.1 Enjoying, feeling confident and importance of speaking languages

To measure participants' language attitudes and motivation they were asked to indicate how much they enjoyed speaking Frisian, Dutch and English, how confident they were speaking the three languages and how important they believed it was to speak the three languages. These questions were asked each measurement and rated at a 5-point scale from "disagree" (1 point) to "agree" (5 points). Table 10 provides an overview of the results in mean scores per measurement.

Table 10. Enjoying, feeling confident and importance of speaking languages (N=77).

		Time 1			Time 2			Time 3		
Languages	Group	N	Mean	SD	N	Mean	SD	N	Mean	SD
Enjoy speaking Frisian	EB	34	4.71	0.63	22	4.77	0.43	34	4.71	0.80
	LB	42	2.67	1.34	26	1.92	1.23	38	2.13	1.26
Confident speaking Frisian	EB	34	4.79	0.48	22	4.77	0.53	34	4.88	0.33
	LB	42	2.10	1.28	26	1.81	1.23	39	1.79	1.03
Important speaking Frisian	EB	34	4.53	0.83	22	4.68	0.65	34	4.35	0.98
	LB	42	2.43	1.40	26	1.69	1.05	39	1.74	1.04
Enjoy speaking Dutch	EB	34	4.09	0.83	22	4.41	0.73	34	4.21	1.23
	LB	42	4.64	0.66	26	4.27	0.83	38	4.32	1.02
Confident speaking Dutch	EB	33	4.42	0.71	22	4.68	0.57	34	4.56	0.93
	LB	42	4.90	0.30	26	4.73	0.53	39	4.67	0.70

Important speaking Dutch	EB	34	4.59	0.82	22	4.91	0.29	34	4.59	1.08
	LB	42	4.90	0.30	26	4.65	0.80	39	4.67	1.01
Enjoy speaking English	EB	34	3.79	1.07	22	4.27	0.77	34	3.85	1.10
	LB	42	4.24	0.76	26	3.92	1.02	38	4.00	1.16
Confident speaking English	EB	34	3.26	0.93	22	3.59	1.05	34	3.44	1.11
	LB	42	3.52	1.06	26	3.58	1.03	39	3.54	1.17
Important speaking English	EB	34	4.38	1.07	22	4.91	0.29	34	4.53	1.02
	LB	42	4.93	0.26	26	4.69	0.55	39	4.64	0.71

Table 11. Multilevel regression model - Enjoying, feeling confident and importance of speaking languages.

Frisian	Enjoy speaking		Confident speaking		Important speaking	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	73.30 (1013.01)	.000*	74.31 (1178.89)	.000*	74.23 (921.15)	.000*
L1	74.48 (91.75)	.000*	75.39 (203.34)	.000*	75.95 (114.16)	.000*
Time	116.85 (3.41)	.033*	118.62 (1.20)	.305	120.05 (6.77)	.002*
L1 * Time	116.58 (3.40)	.037*	118.34 (2.03)	.136	119.62 (5.58)	.005*
Gender	73.12 (9.39)	.003*	74.01 (1.62)	.207	74.04 (2.31)	.133
Dutch	Enjoy speaking		Confident speaking		Important speaking	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	71.19 (2751.32)	.000*	64.48 (6165.79)	.000*	70.57 (4623.85)	.000*
L1	74.80 (4.81)	.031*	68.07 (7.80)	.007*	74.36 (2.77)	.100
Time	121.26 (0.66)	.520	114.72 (.584)	.560	122.12 (1.15)	.319
L1 * Time	120.54 (4.36)	.015*	114.04 (2.71)	.071	121.31 (0.39)	.676
Gender	72.13 (3.02)	.087	65.56 (1.93)	.169	71.60 (10.26)	.002*
English	Enjoy speaking		Confident speaking		Important speaking	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	73.01 (1749.07)	.000*	73.98 (1125.38)	.000*	61.09 (5238.09)	.000*
L1	75.98 (1.39)	.242	75.95 (0.10)	.748	64.88 (6.49)	.013*
Time	121.14 (0.41)	.668	120.41 (0.13)	.877	113.01 (1.12)	.329
L1 * Time	120.53 (1.87)	.159	119.93 (0.93)	.398	112.12 (0.86)	.427
Gender	73.50 (0.05)	.827	73.87 (5.88)	.018*	62.25 (9.65)	.003*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Results were analysed using a multilevel regression model with *L1, Gender* and *Time* as fixed factors and are shown in table 11. What immediately stands out is that the main differences between the two groups are found in how they experienced the Frisian language. On all three measurements EB rated the three categories, enjoying, feeling confident and importance of speaking Frisian language, significantly higher than their LB peers. For enjoying speaking the Frisian language effect size was large at d = 2.32, for feeling confident speaking the Frisian language the effect size is large at d = 3.30 and for how important it is to speak the Frisian the effect size is large at d = 2.45. Taking into account that the questions had to be rated at a 5-point scale these effect sizes are quite expressive in how different EB's and LB's attitudes are towards the Frisian language. There are also differences in how EB and LB experienced the Dutch language. LB enjoyed speaking the language more and felt more confident with small effect sizes of d = -.13 and d = -.21 respectively. Finally, *L1* played a role in how important participants found it to speak the English language. LB found it more important to be able to speak English compared to EB. The effect size was small at d = -.22.

Gender played a role in how much boys and girls enjoyed speaking the Frisian language, which girls enjoyed more. The effect size was medium at d = -.66. Girls found it more important to speak the Dutch language, compared to boys. The effect size was medium at d = -.57. Finally, there were gender differences in the confidence with which boys and girls speak English and how important they believed it is to speak the English language. Boys were more confident in speaking the English language, with a small effect size of d = .49. Girls believed it is more important to be able to speak the English language with a medium effect size of d = -.55.

Time was significant for enjoying speaking the Frisian language with a small effect size from measurement 1 to 2 of d = .43, a small effect size of d = .14 from measurement 2 to 3 and a medium effect size of d = .57 from measurement 1 to 3. The results showed that LB significantly less enjoyed speaking the Frisian language during the school year. *Time* was also significant for how important it is to speak the Frisian language with a medium effect size from measurement 1 to 2 at d = .60, a small effect size of d = .26 from measurement 2 to 3 and a large effect size of d = .86 from measurement 1 to 3. LB valued the importance of speaking the Frisian language less during each measurement. *Time* did not influence the ratings on the Dutch and English language as results over the three measurements stayed stable.

4.5.2.2 Joy and ease of language learning

Participants were also asked whether they enjoyed learning languages in general and how much effort it took them to learn languages. This question was asked in

measurements 1 and 3 and measured at a 5-point scale, from "not fun" (1 point) to "fun" (5 points) for enjoying language learning and from "difficult" (1 point) to "easy" (5 points) for how much effort it took to learn languages. Table 12 provides an overview of the results in mean scores per measurement.

Table 12. Joy and ease of language learning (N=77).

		Time 1			Time 3		
Activity	Group	N	Mean	SD	N	Mean	SD
Joy of language learning	EB	34	3.35	0.95	34	3.24	0.99
	LB	43	4.02	0.89	37	3.16	1.09
Ease of language learning	EB	34	3.21	0.88	34	2.97	1
	LB	43	3.3	1.01	37	2.92	0.86

Table 13. Multilevel regression model - Joy and ease of language learning.

	Joy of language learning		Ease of language learning	
	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	76.14 (1192.93)	.000*	75.82 (1046.10)	.000*
L1	76.14 (2.34)	.130	75.82 (0.03)	.871
Time	72.55 (20.75)	.000*	72.33 (8.32)	.005*
L1 * Time	72.55 (11.87)	.001*	72.33 (.391)	.534

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors as shown in table 13. The results in tables 12 and 13 show that there were no differences between the two groups when it came to the influence of the main factor *L1*. There was no difference between EB and LB in how much they enjoyed learning languages and how much effort it took them to learn languages.

The main factor *Time* was significant for both the joy and ease of language learning with a large effect size of d = .87 for enjoying learning languages. However, this was only for LB whose rating decreased from "bit fun" to "neutral" between measurements 1 and 3. *Time* was also significant for the ease of language learning and had a small effect size of d = .39. Again, this was only for LB who went from in between "neutral" and "bit easy" to "neutral" from measurement 1 to 3, implying that during the school year they found it slightly more difficult to learn languages. Lastly, table 13 shows that the two-way interaction between *L1* and *Time* was significant for joy of language learning.

4.5.2.3 Main conclusions attitudes and motivation towards language learning

In this section, the second research question of the focus point socio-psychological factors was discussed, whether being an EB or LB influences the speaker's language attitudes and motivation towards languages and language learning, including the influence of the development over time. Several expectations concerning the influence of L1, gender and time were formulated. First of all, it was expected that EB have a higher positive attitude and motivation towards Frisian, which is confirmed by the results. EB enjoy and are more confident speaking the Frisian language and also find it more important to speak it, compared to LB. That LB are less positive about the Frisian language has most probably to do with the stigmatisation of the Frisian language, as mentioned in section 2.3. It was furthermore expected that EB and LB would have an equal positive attitude and motivation towards Dutch and English. This is only partly confirmed by the results. As expected, EB and LB equally rate how important they find it to speak the Dutch language, how much they enjoy speaking the English language and how confident they feel speaking the English language. However, LB enjoy speaking the Dutch language more and feel more confident speaking it compared to EB. Furthermore, LB find it more important to be able to speak English compared to EB.

The second expectation was that EB enjoy language learning more and find it easier to learn languages compared to LB. This is not confirmed by the results. There is no influence of being EB or LB on how much participants enjoy language learning or how easy they find it based on their L1. In other words, EB do not find it more joyful nor easier to learn languages than LB.

The third expectation was that girls are more motivated and find it easier to learn languages than boys. This hypothesis was only partly confirmed. The results on enjoying, feeling confident and importance of speaking Frisian, Dutch and English showed that girls enjoy speaking Frisian more than boys. Furthermore, girls find speaking Dutch and English more important than boys. Boys feel more confident than girls when speaking English. The results on the joy and ease of language learning showed no gender differences.

The final expectation was that attitude and motivation towards languages and language learning increases during the school year. This hypothesis is not met. In general, EB stay stable throughout the period in which they were measured, one school year. However, LB are less positive about enjoying learning languages and the ease of learning languages during the school year. LB also show a decrease in the rating of how much they enjoy, feel confident and find it important to speak the Frisian language.

4.6 Discussion

The main aim of this chapter was to further characterise the dissertation's participants by measuring their amount of language contact and their attitudes and motivation towards languages and language learning. This chapter discussed whether being an EB or LB influences a) how much one is exposed to the different languages (language contact), b) the speaker's language attitudes and motivation towards languages and language learning and includes the influence of the development over time. Besides *L1* and *Time*, *Gender* was added wherever it improved the multilevel regression model.

As discussed in section 4.2.1, language contact is critical in language learning. The more contact and exposure with the target language, the easier it is learned (Thomas & Roberts, 2011, Muñoz & Lindgren, 2011; Lindgren & Muñoz, 2013). In the current study, the results on the type and amount of language contact differ slightly between EB and LB. The biggest difference between EB and LB lies in the amount of contact with Frisian. In line with the expectations, more EB than LB use Frisian in their daily activities. Language contact was also measured through a parents' questionnaire. Contrary to expectations the exposure to Dutch is about similar for both groups. Secondly, more LB than EB are exposed to English at home through watching English TV/DVD. Results show that the participants are differently exposed to the three languages through their parents. More EB than LB parents use Frisian for their daily activities and in turn more LB than EB fathers use English for listening to the radio and reading. Finally, EB participants indicate that they have more contact with English through persons (family, friends, etc.) than LB. This exposure at home might influence how the English language develops. As mentioned in section 4.2.1, *linguistic self-confidence* plays a role in foreign language learning, which is the quality and quantity of language contact (Dörnyei, 2005). LB have an advantage here since they are more exposed to the English language at home. As mentioned in section 3.2.1, higher SES can positively influence language learning as for example language learning is discussed more, children receive more help with their homework and literacy skills might be higher compared to lower SES families (De Angelis, 2015). Since LB participants are from a higher SES background, they might also profit from this in their language development. Besides at home, there are also differences in the amount of contact with the three languages inside school. LB teachers use more English than Dutch in their lessons whilst EB teachers use more Dutch than English in their lessons. Finally, gender comparisons show that girls spend more time on reading but there are no other gender differences for the time spent on language related activities which is in contrast to the expectation and an earlier study by Bonnet (2004) that showed that boys watch more television than girls.

When comparing EB and LB on language attitudes and motivation towards language learning also differences were found. In line with expectations and as was also found in earlier studies by Lasagabaster (2001) and Cenoz (2001) EB are more positive towards the minority language (Frisian) than LB. EB enjoy speaking the Frisian language more, feel more confident speaking it and find it more important to speak it than their LB peers. In line with what Benedictus (2005) and Gorter and Ytsma (1988) found LB are more negative towards the Frisian language than EB. Also, the *linguistic self-confidence* (Dörnyei, 2005) most probably plays a role in this: the quality and quantity of contact with the Frisian language is generally very low for LB in the current study. On the other hand, LB are more confident speaking the Dutch language compared to their EB peers although the amount of language contact in Dutch is almost similar for both groups. When it came to the English language though, unlike in other studies (Lasagabaster, 2001; Cenoz, 2001; Ytsma, 2007) and in line with expectations EB are not less positive about the English language compared to their LB peers. In other words, EB do not view English as a threat for the Frisian language. Also in line with expectations, LB enjoy language learning in general less during the school year and found it increasingly difficult to learn languages. This is where Dörnyei's *possible selves* come into play. As explained in section 4.2.2, possible selves represent the language learner's ideas of what they might, want and are afraid of becoming (Dörnyei, 2005). Possibly, negative *L2 language experience* of LB influences their attitude towards language learning, decreases their intrinsic motivation and negatively influences their *ideal L2 self*. They might have found learning languages more difficult than they had envisioned at the start of the school year. Furthermore, the role of their environment might have added to this, for example classmates that also dislike language learning. The results also showed gender differences for language attitudes and motivation. Girls enjoy speaking the Frisian language more and find speaking Frisian and English more important than boys. This is in line with earlier findings that females have a more positive attitude towards learning foreign languages compared to males and are willing to put more effort into language learning (Dörnyei, Csizér and Németh, 2006; Pavlenko & Piller, 2007; Wright, 1999). Boys on the other hand feel more confident speaking English.

Finally, how language contact and language attitudes and motivation developed over the course of the school year was discussed. The amount of language contact stays rather stable for EB and LB during the school year, except for reading which saw a significant drop for both EB and LB. Other differences are that LB watch less TV/DVD, listen to music more and use the Internet more from measurement 1 and 3. The language attitudes and motivation of EB also stays at a stable

level throughout the school year. LB on the other hand have become more negative towards the Frisian language and do not enjoy language learning nor find it easier to learn languages as the school year progressed. This shows that indeed motivation can be dynamic as Dörnyei (2005) claims. Time also influences gender differences. Boys enjoy speaking Frisian less and find it less important to speak Frisian from measurement 1 to 3. Boys also enjoy learning languages less and find it more difficult to learn languages from measurement 1 to 3.

To sum up, results show that EB are more exposed to the Frisian language at home, are more confident about their Frisian language skills and are more positive towards the Frisian language in general compared to LB. LB on the other hand are slightly more exposed to the English language at home and are more self-confident in their Dutch language skills compared to EB. They are however quite negative towards the Frisian language, and this has a downwards tendency during the school year. Table 14 provides an overview of the characteristics of EB and LB based on this part of the dissertation's results.

Table 14. Characteristics EB and LB on socio-psychological factors (N=77).

	EB	LB
Amount of language contact	more exposure to Frisian	more exposure to English
Attitudes and motivation towards languages and language learning	more positive towards Frisian	more positive towards Dutch and English
Development over time	stay stable	become more negative towards Frisian and language learning in general

4.7 Conclusion

What this chapter has shown first of all is that EB and LB differ in the amount and quality of language contact and also in their attitudes and motivation towards language learning. What this chapter has also shown is that not only the degree of bilingualism exerts an influence on these variables, gender also influences language contact and language attitudes and motivation. Furthermore, the development over time is interesting in that EB stay stable in their language attitude and motivation towards languages and languages learning during the school year whereas LB become more negative towards Frisian and language learning in general. The results have shown that there is no strict separation possible between EB and LB as many variables play a role when trying to characterise both participant groups.

This is especially the case when studying minority language speakers, which are typified by a strong and deep-rooted connection to their language and culture.

The above results thus implicate that when comparing EB and LB on language development, one should not only take L1 into account. Other variables such as gender, time, language contact and language attitudes and motivation all play a role. By including these, a complete picture arises of what characterises the participants in a study and hence, what influences the results of the variables being studied. These characteristics can influence the participants' performance in other areas under study, like for example their oral language proficiency and language processing, as in the case of this dissertation and which are discussed in chapters 5 and 6 respectively.

Chapter 5 - Oral language proficiency

5.1 Introduction

Chapter 4 has shown that EB and LB differ on their amount and quality of language contact and in their attitudes and motivation towards language learning. The current chapter looks at the participants' self-assessment of and actual language proficiency in Frisian, Dutch and English comparing EB and LB and takes development over time into account. It further takes into account the main findings from chapter 4.

The focus point oral language proficiency deals with the question whether EB and LB differ on a) their self-assessment of language proficiency, b) English vocabulary knowledge c) their oral language proficiency in Frisian, Dutch and English and includes the development over time.

This chapter first of all discusses participants' self-assessment of language proficiency to measure how they view their own language learning. The chapter continues discussing participants' actual language proficiency, measured through an English vocabulary task and oral proficiency tasks in the three languages. Both these tasks are linked to participants' self-assessment of language proficiency. By including Frisian and Dutch oral language proficiency, this chapter also clarifies whether the division of participants in EB and LB is justified.

5.2 Theoretical background

5.2.1 Self-assessment of language proficiency

The proficiency in different languages might influence the self-assessment of language proficiency. The better one's language proficiency the more positive one might rate his own language proficiency. Earlier research by Popma and Arocena Egaña (2013) has shown that Frisian secondary school pupils evaluate their Dutch language skills higher than their Frisian and English skills. One of the reasons for this difference lies in rating themselves as incompetent in Frisian and English reading and writing. The participants even indicated to have better English than Frisian reading and writing skills. This can be explained by the fact that little attention is paid to Frisian literacy skills in education in Fryslân (see also section 1.1). When the self-assessment of language skills is rated low, this can influence the use of the languages. Research by Williams (2002) showed that some Welsh children indicated their knowledge of Welsh as weak, despite the fact that they did well on examinations. This low self-assessment of minority language proficiency could result in

less self-confidence and prevent the children from using the language in a wider (social) context. This in turn threatens becoming truly multilingual as according to Thomas and Roberts (2011) multilingualism only becomes a reality when speakers use the language(s) not only in the school context but in a social context as well. Thomas and Roberts (2011) further argue that bilinguals can be very different through differences in linguistic experience that lead to different levels of linguistic achievements and different kinds of attitudes and motivation which in turn lead to different levels of confidence in language learning.

Besides differences in self-assessment as a result of one's L1, gender can play a role as well. According to Watt (2004) boys and girls can have different beliefs about their own competence when they start school. Watt (2004) studied adolescents' self-perceptions in relation to Maths and English amongst 7th to 11th grade students. She found that boys believed they would be successful in Maths throughout grade 7 to 11 and that girls perceived Maths as more difficult than boys did. For English, there were no gender differences although these were expected based on earlier research (e.g. Jacobs et al., 2002; Watt, 2002). Furthermore, both boys and girls found English increasingly difficult from grade 7 to 11.

5.2.2 EFL vocabulary test

To test participants' receptive English vocabulary knowledge, a vocabulary test was used. Typically, this type of test consists of two types of items: real words and pseudo-words (Huibregtse, Admiraal & Meara, 2002). Participants are presented with a list of words and are asked to indicate whether or not they know the meaning of the words. Because these tests are prone to guessing, this is usually corrected for in the scoring of the tests. For this dissertation, the *English Foreign Language vocabulary test* (EFL vocabulary test) by Meara (1992) was chosen to measure participants' receptive English vocabulary knowledge. The details of the Meara-test are discussed in chapter 3, section 3.3.3.

5.2.3 Oral proficiency: fluency, lexical fluency strategies and lexical richness

There are many aspects of oral language proficiency that can be measured such as grammar, phonology, fluency and vocabulary. In this dissertation, the emphasis was on fluency, lexical fluency strategies and lexical richness. These three measures were chosen because the dissertation's participants are only beginning English language learners. Their language is characterised by disfluencies (de Jong, Groenhout, Schoonen & Hulstijn, 2015), strategies that fill in lexical gaps (Cook, 1996) and high-frequent simple words (Laufer & Nation, 1995). It is also characterised

by a lot of variability (Schmid, Verspoor & MacWhinney, 2011), which is why participants were tested three times in one school year. In the following sections the background of the chosen factors are explained.

5.2.3.1 Fluency

When we speak we are constantly organising our thoughts. We use different strategies to formulate our intentions as accurate as possible. Examples of such strategies are for example the use of pauses, filled pauses like 'eh' and 'uhm', false starts, repetitions, reformulations and trailing offs. Some speakers make more use of these strategies than others which results in different speaking styles. These can occur in one's L1 but also, and sometimes even more so, in one's L2, L3, Lx as a result of slower processing from thought to formulation and articulation. Following de Jong, Groenhout, Schoonen and Hulstijn (2015, p. 224) fluency is considered here "as an aspect of overall speaking proficiency, also described as fluency in the narrow sense (Chambers, 1997; Lennon, 1990)". In their study, de Jong et al. (2015) compared English and Turkish native speakers on fluency in L2 Dutch. They took fluency in the L1 of the participants into account in the analysis of the participants' L2 because speakers may differ on temporal aspects of speech and show these in their L1 as well as L2. De Jong et al. (2015) did this by partialling out the L1 variance from the L2 measures, as proposed by Segalowitz (2010). By doing so, they were able to filter out any disfluencies based on speaking style of the participants to get a more precise measure of L2 fluency. If one would only take L2 fluency into account the question remains how much of the measured disfluency is caused by the level of L2 proficiency and how much is caused by speaking style. In the current study the same strategy is adapted. Not only fluency in the L3 is studied but also fluency in the L1 and L2 and the fluency measures in three languages are compared to each other. On top of that the influence of L1 disfluency on L3 fluency is partialled out. Skehan (2003) and Tavakoli and Skehan (2005) came up with the following scheme that notes several aspects of fluency that can be studied:

- breakdown fluency: number and length of (filled) pauses
- repair fluency: false starts and repetitions
- speed fluency: speech rate: speed and density per time unit

In the current study breakdown and repair fluency are taken into account. Fluency of the participants in the three languages is measured on the following variables: number of filled pauses, number of repetitions, retracings and reformulations, number of trailing offs and number of self-completed sentences.

5.2.3.2 Lexical fluency strategies

In this dissertation, several strategies were measured that language learners use to fill in gaps in their vocabulary. As Cook (1996) argues:

> The strategies exist to plug gaps in the learners' vocabulary by allowing them to refer to things for which they do not know the L2 words; a better name is then compensatory strategies - L2 learners are always having to compensate for the limited vocabulary at their disposal. (p. 90)

The first of these types of strategies is transferring words from the L1 and/or L2 into the L3. Transfer mostly appears in the beginning stages of foreign language acquisition when speakers lack vocabulary knowledge in the L3 and use their L1 and/or L2 to express the word. Transfer thus mostly takes place into the weaker language. A second strategy when vocabulary in the target language lacks, is the use of neologisms. These are newly formed words, for example composed or derived from existing words in the other languages the speaker knows (Goorhuis & Schaerlakens, 2000). Poulisse (1989, p. 62) calls this strategy "*morphological creativity*": for making up a new word the common word endings of the target language are used. Poulisse gives the example of 'ironize' for 'ironing' (Poulisse, 1989). Overextension is the third strategy used, which implies that words are used in a wider sense than they are meant to (Kuiken, 2002). For example, the use of the word 'dog' for all animals that walk on four legs. A fourth strategy used by language learners is the achievement strategy (Cook, 1996). One of the characteristics of this strategy is that the language learner asks for help and the interlocutor prompts the word. Finally, avoidance is the fifth strategy that is used by many (beginning) language learners. Certain words or characteristics of the language like pronunciation or morphemes are avoided by the language learner because they appear to be too difficult for them (Cook, 1996; Lightbown & Spada, 1999) or can not be retrieved in time. In the current study the number of uses of transfer, neologisms and prompts were counted. Furthermore, the number of lexical and grammatical errors were counted. Lexical errors included overextensions and wrongly chosen words. For example, 'she' instead of 'they' or 'flower' instead of 'floor'. Grammatical errors mostly included wrong prepositions (e.g. 'an dog'), incorrect subject-verb agreement (e.g. 'the boy win') or incorrect tense (e.g. 'then coming a car').

5.2.3.3 Lexical richness

One can imagine that a beginning language learner's vocabulary knowledge consists mostly of simple and high frequent words that are often repeated whereas a more experienced language learner's vocabulary may consist of less frequent and more difficult words. Additional language vocabulary is usually studied through looking at

lexical richness. Lexical richness can, according to Read (2000, p. 200-201) be divided into four dimensions: *lexical density*, *lexical diversity*, *lexical sophistication* and *proportion of errors*. *Lexical density* measures the proportion of content words (nouns, verbs, adjectives, adverbs) to the total number of words (Johansson, 2008). Texts with a high percentage of content words contain more information than texts with a lot of function words (prepositions, interjections, pronouns, etc.) (Johansson, 2008). *Lexical diversity* is measured by counting the number of different words used in a text. There has been a lot of debate on how lexical diversity is accurately measured. The very straightforward method of dividing the number of different words (types) by the total number of words (tokens) - called TTR - is problematic because it is heavily influenced by text length. With increasing text length, the ratio between types and tokens decreases systematically as speakers have to repeat themselves, making it hard to compare texts with different lengths (Daller, 2010). Other lexical diversity measures experimented with a growing instead of a falling (as in the TTR) growth of word types. Examples of such measures are Guiraud's index (Guiraud, 1954) that takes the number of types divided by the square root of the number of tokens or the Maas Index (Maas, 1972) that uses log corrections for the types and tokens. However, these turned out to still be influenced by text length (Tweedie & Baayen, 1998). Malvern and Richards (1997) came up with the curve-fitting model D which supposedly should not be influenced by text length. According to Schmid, Verspoor and MacWhinney (2011) D "is based on the probability of new words appearing in longer and longer stretches of text". It has been widely used by researchers in L1 and L2 acquisition, bilingual studies and for many different languages (Treffers-Daller, 2013). D can automatically be measured in CLAN (CHILDES program) through VOCD, which stands for Vocabulary D statistic. According to MacWhinney (2017, p. 139) the D measure "has three advantages: it is not a function of the number of words in the sample; it uses all the data available; and it is more informative, because it represents how the TTR varies over a range of token size." To calculate D, "VOCD uses random sampling of tokens plotting the curve of TTR against increasing token size for the transcript under investigation" (MacWhinney, 2017, p. 140). In other words, it aims at finding the best curve to model the TTR in the text (Šišková, 2012). Although it is also text length dependent, the D measurement seems to work well for short child language samples (Van Gijsel, Speelman & Geeraerts, 2005), which is why it was chosen to measure lexical diversity in the current study. *Lexical sophistication* measures the proportion of sophisticated or advanced words in a text (Johansson, 2008). This is done by looking at the frequency of words that are used by the participants. Low frequency words are believed to be more sophisticated than high-frequency words (Laufer & Nation, 1995). As proficiency increases, learners tend to use more low-frequent, i.e. sophisticated, words. It is quite

common in lexical sophistication studies to use written language corpora for analyses. However, written and oral language differ in lots of ways, e.g. the number of function words is much higher in oral language and sentences are usually shorter compared to written language. Therefore, using written corpora to calculate oral word frequency might give validity problems (Lindqvist, Gudmundson & Bartel, 2013). For this reason, in the current study the participants' own oral language corpora per language were used to measure lexical sophistication. The *proportion of errors* is the last aspect of lexical richness noted by Read (2000). According to Lindqvist et al. (2013) this is the use of words that do not exist in the target language. They continue explaining that these types of words are an important aspect of vocabulary knowledge, especially at the earlier stages of development (Lindqvist, 2009; Williams & Hammarberg, 1998), as is the case for the participants in the current study.

In this dissertation, lexical richness is measured by looking at the following aspects: lexical diversity, lexical sophistication and proportion of errors. Lexical diversity is measured through the D measurement. Lexical sophistication is measured by looking at the division of high and low frequent words in the participants' own language corpora. The proportion of errors is measured through counting the proportion of neologisms, lexical errors and grammatical errors used by the participants.

5.2.4 Development over time

It was interesting to see what the influence of the amount of teaching hours in English that the participants got throughout the school year would be on their self-assessment of language proficiency, EFL vocabulary test scores and their Frisian, Dutch and English language proficiency. After all, compared to primary school the number of English teaching hours doubled to quadrupled. This meant that progress in English should be rather rapid. This could show in participants' self-assessment of language proficiency. Self-assessment of language proficiency could undergo changes during the school year as a result of the received language lessons. As the school year progresses the participants' language proficiency in the three languages increases and they might rate their language skills higher than at the start of the year.

The influence of the increase in number of English teaching hours, compared to primary school, could also show in the results on the EFL vocabulary test which might improve during each measurement.

In oral language proficiency (as measured by fluency, lexical fluency strategies and lexical richness) the role of time was very important since the participants were at beginning stages of their L3 development. As Schmid, Verspoor & MacWhinney (2011) argue:

> … the process of SLD (second language development) usually implies an overall increase of linguistic knowledge, accuracy across all linguistic levels and complexity of vocabulary and style but there may also be trade-offs between the individual components of language, in particular in situations where there is intensive development of one of these components. (p. 39)

As pointed out in section 2.6, language development is not stable and shows variability (Schmid et al., 2011). In other words, language development is not a smooth path that will automatically lead to an ultimate stage but it knows a lot of holes and bumps and the speed of development can fluctuate. The question is what role time plays. Are there less disfluencies, less lexical strategies needed and is there a higher lexical richness between the beginning and the end of the school year?

5.3 Hypotheses

This part of the dissertation focuses on self-assessment of language proficiency, the level of English vocabulary knowledge and the level of oral proficiency in Frisian, Dutch and English. Oral language proficiency is studied by looking at fluency, lexical fluency strategies and lexical richness. The role of time is very important, especially since the participants are at beginning stages of their L3-development and their development goes through different stages that know highs and lows. The question is what role time plays and whether there are differences in self-assessment of language proficiency, English vocabulary knowledge and oral proficiency in Frisian, Dutch and English between the beginning and the end of the school year.

The following hypotheses were formulated:

1) Self-assessment of language proficiency:
    a. EB rate themselves higher on Frisian proficiency and EB and LB rate themselves similarly on Dutch and English proficiency.
    b. There are no gender differences in the rating of Frisian, Dutch and English proficiency.
    c. The rating of self-assessment of language proficiency increases during the school year.
2) EFL vocabulary test:
    a. EB score higher at the EFL vocabulary test than LB.
    b. There are no gender differences in EFL vocabulary test scores.
    c. The EFL vocabulary test scores increase during the school year.

3) Oral language proficiency in Frisian, Dutch and English
    a. Fluency
        i. EB have less disfluencies in Frisian and English and a similar number of disfluencies in Dutch compared to LB.
        ii. There are no gender differences in the number of disfluencies for Frisian, Dutch and English
        iii. Participants show a decrease in the number of disfluencies during the school year.
    b. Fluency strategies
        i. EB make less use of lexical fluency strategies in Frisian and English and use a similar number of lexical fluency strategies in Dutch compared to LB.
        ii. There are no gender differences in the number of lexical fluency strategies for Frisian, Dutch and English.
        iii. Participants show a decrease in the number of lexical fluency strategies used during the school year.
    c. Lexical richness
        i. EB have a higher lexical richness in Frisian and English and a similar lexical richness in Dutch compared to LB.
        ii. There are no gender differences in lexical richness for Frisian, Dutch and English.
        iii. Participants show a higher lexical richness during the school year.

5.4 Method

5.4.1 Participants

The participants were 34 EB and 43 LB, as described in chapter 3, sections 3.1 and 3.2.

5.4.2 Materials and procedures

The materials and procedures are discussed in chapter 3, sections 3.3.2, 3.3.3 and 3.3.4.

5.4.3 Statistical analysis

The collected data consisted of 198 participant questionnaires, 189 EFL vocabulary tests and 199 Frisian, 199 Dutch and 194 English picture story tasks. The data was all entered in SPSS. For all data, a multilevel regression model was used with the fixed factors *L1 (EB or LB)* and *Time (measurement 1, 2 and 3)*. Where it turned out a significant predictor, *Gender* was also included. For the English vocabulary

task and picture story task, the influence of language contact and attitudes and motivation towards languages and language learning was included as a covariate wherever it turned out to be significant. For the picture story task in all analyses, except VOCD (Vocabulary D statistic), the average text length over the three measurements per language was taken into account by including it as a covariate. For the fluency measures (number of filled pauses, repetitions, etc.) the influence of L1 on the L3 (English) was taken into account and included as a covariate. Effect sizes were calculated using Cohen's d_s.

5.5 Results

5.5.1 Self-assessment of language proficiency

This section deals with research question a, which was whether EB and LB differ on their self-assessment of language proficiency. It was expected that a) EB rate themselves higher on Frisian proficiency and EB and LB rate themselves similarly on Dutch and English proficiency, b) there are no gender differences in the rating of Frisian, Dutch and English proficiency and c) the rating of self-assessment of language proficiency would increase during the school year.

5.5.1.1 Self-reported language proficiency

Participants were asked to rate their Frisian, Dutch and English speaking, listening, reading and writing skills. This was done using a 5-point scale from "not at all" (1 point) to "very good" (5 points). The question was asked in every measurement. As mentioned before, the analysis of the rating focussed on the rating and not on the results of the self-assessment task. The results are shown in table 1 in mean scores per measurement.

Table 1. Self-reported language proficiency (N=77).

		Time 1			Time 2			Time 3		
Skills and languages	Group	N	Mean	SD	N	Mean	SD	N	Mean	SD
Frisian speaking skills	EB	22	4.50	0.60	34	4.59	0.50	34	4.62	0.49
	LB	26	2.19	1.30	43	2.37	1.07	39	2.21	1.06
Frisian listening skills	EB	22	4.73	0.55	34	4.65	0.54	34	4.76	0.43
	LB	26	3.69	1.01	42	3.57	1.02	39	3.67	1.15
Frisian writing skills	EB	22	3.32	0.72	34	3.35	0.65	34	3.59	0.82
	LB	26	1.73	0.96	42	1.86	0.81	39	1.72	0.72
Frisian reading skills	EB	22	3.86	0.89	34	4.15	0.78	34	4.32	0.64
	LB	26	2.46	1.27	42	2.98	1.09	39	2.82	1.02
Dutch speaking skills	EB	22	4.82	0.40	34	4.62	0.55	34	4.71	0.63
	LB	26	4.96	0.20	43	4.93	0.26	39	4.82	0.39
Dutch listening skills	EB	21	4.86	0.36	34	4.82	0.39	34	4.91	0.38
	LB	26	4.96	0.20	43	4.98	0.15	39	4.97	0.16
Dutch writing skills	EB	21	4.86	0.36	34	4.76	0.43	34	4.56	0.66
	LB	25	4.84	0.37	43	4.60	0.70	39	4.44	0.72
Dutch reading skills	EB	22	4.86	0.35	34	4.91	0.29	34	4.88	0.41
	LB	26	4.96	0.20	43	4.95	0.31	39	4.90	0.31
English speaking skills	EB	22	3.14	0.83	34	3.38	0.55	34	3.26	0.83
	LB	26	3.35	0.69	43	3.53	0.80	39	3.46	0.85
English listening skills	EB	22	3.18	0.80	34	3.32	0.73	34	3.65	0.77
	LB	26	3.92	0.74	43	3.86	0.86	39	3.85	0.87
English writing skills	EB	22	2.68	0.65	34	3.21	0.73	34	3.44	0.75
	LB	25	3.28	0.84	43	3.51	0.74	39	3.41	0.72
English reading skills	EB	22	3.00	0.76	34	3.47	0.66	34	3.62	0.85
	LB	26	3.62	0.70	43	3.88	0.82	39	3.79	0.92

Table 2. Multilevel regression model - Self-reported language proficiency.

Frisian	Speaking skills		Listening skills		Writing skills		Reading skills	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	74.45 (1255.11)	.000*	74.67 (2667.85)	.000*	74.48 (1184.57)	.000*	74.71 (1299.02)	.000*
L1	75.32 (130.07)	.000*	77.17 (35.45)	.000*	76.67 (102.83)	.000*	76.69 (40.98)	.000*
Time	119.06 (0.05)	.951	122.48 (1.46)	.237	121.50 (0.21)	.813	121.19 (4.16)	.018*
L1 * Time	118.83 (0.31)	.733	121.86 (0.11)	.898	120.94 (2.61)	.078	120.67 (0.82)	.443
Gender	74.38 (2.57)	.113	75.30 (4.78)	.032*	74.94 (3.35)	.071	75.07 (2.83)	.097
Dutch	Speaking skills		Listening skills		Writing skills		Reading skills	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	73.33 (14729.82)	.000*	69.54 (57984.65)	.000*	71.36 (6709.24)	.000*	79.05 (39084.19)	.000*
L1	73.33 (7.09)	.010*	69.54 (6.78)	.011*	71.36 (0.49)	.488	79.05 (1.19)	.279
Time	122.21 (1.49)	.231	131.35 (0.45)	.638	116.60 (6.89)	.001*	135.22 (0.37)	.694
L1 * Time	122.21 (1.47)	.234	131.35 (0.48)	.622	116.60 (0.78)	.462	135.22 (0.31)	.731
English	Speaking skills		Listening skills		Writing skills		Reading skills	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	75.00 (2081.95)	.000*	73.73 (2244.41)	.000*	75.84 (2165.99)	.000*	74.59 (2453.78)	.000*
L1	77.26 (0.56)	.455	76.02 (6.30)	.014*	78.14 (2.58)	.112	77.78 (4.99)	.028*
Time	122.64 (2.37)	.098	121.50 (2.43)	.092	122.83 (10.97)	.000*	124.54 (6.10)	.003*
L1 * Time	122.10 (0.04)	.965	120.95 (2.28)	.106	122.30 (3.79)	.025*	123.84 (1.39)	.254
Gender	75.32 (4.91)	.030*	74.07 (6.35)	.014*	75.87 (3.96)	.050*	75.45 (5.69)	.020*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Results were analysed using a multilevel regression model with *L1, Time* and because it turned out to be a significant predictor *Gender* was added as a fixed factor for Frisian and English. Table 17 shows that the main factor *L1* was significant for all four Frisian language skills. The effect sizes were all large: for speaking d = 2.55, for listening d = 1.18, for writing d = 2.35 and for reading d = 1.45. In all cases EB rated their Frisian language skills higher than LB. EB rated their Frisian speaking, listening and reading skills between "good" and "very good" whilst LB rated this between "not good" and "good". Ratings for Frisian writing were lower for both groups: on average EB rated their Frisian writing skills "sufficient" and LB "not good". Although both groups rated their Dutch speaking and listening skills as "very good", the analysis showed that the impact of *L1* was significant for two of the four skills with small effect sizes: d = -.12 for speaking and d = -.06 for listening. LB rated their Dutch speaking and listening skills slightly higher than EB did but the impact was minor since the effect sizes were very small. Finally, *L1* was significant for two of the four English language skills: listening with a small effect size of d = -.19 and reading with a small effect size of d = -.16. On average LB rated their English listening and reading skills higher with "good" than EB who rated the same skills with "sufficient".

The main factor *Gender* was significant for one of the four Frisian language skills: listening with a small effect size of d = -.45. Girls rated their Frisian listening skills higher than the boys did. Girls rated their listening skills between "good" and "very good" whilst boys rated their listening skills between "sufficient" and "good". There were no differences for Dutch language skills. For English, there were gender differences for all four language skills. Effect sizes were small for speaking (d = .44), medium for listening (d = .50), small for writing (d = .39) and small for reading (d = .44). Although both boys and girls rated themselves between "sufficient" and "good" for all four English language skills (except girls for English writing skills in measurement 1, which was almost "sufficient) boys rated themselves around half a point higher for each of the four skills during all three measurements.

The main factor *Time* also played a significant role in some of the language skills. First of all, for Frisian reading with small effect sizes: d = -.37 from measurement 1 to 2, d = .10 from measurement 2 to 3 and d = -.27 from measurement 1 to 3. It is not entirely clear where the significant result came from. EB had a growth in rating from measurement 1 to 3 from almost "good" to between "good" and "very good". LB had a growth in rating from measurement 1 to 2 from between "not good" and "sufficient" to "sufficient". It is interesting to see that in measurement 3 LB rated their Frisian reading skills in between "not good" and "sufficient" again. These results in itself however were not significant, only the overall analysis was. *Time* was also significant for Dutch writing with a small effect size of d = .39 from measurement 1 to 2, a small

effect size of *d* = .30 from measurement 2 to 3 and medium effect size of *d* = .68 from measurement 1 to 3. This result was only significant for LB who rated their Dutch writing skills 0.2 point lower with each measurement, all between "good" and "very good". Furthermore, *Time* was also significant for English writing and reading. For English writing the effect sizes were all small: *d* = -.38 from measurement 1 to 2, *d* = .12 from measurement 2 to 3 and *d* = -.27 from measurement 1 to 3. This was only the case for EB who had a significant growth from "not good" in measurement 1 to "sufficient" in measurement 2 to in between "sufficient" and "good" in measurement 3. The effect sizes for English reading were also all small: *d* = -.37 from measurement 1 to 2, *d* = .11 from measurement 2 to 3 and *d* = -.26 from measurement 1 to 3. Again, this was only the case for EB. From measurement 1 to measurements 2 and 3 they rated their English reading skills from "sufficient" to in between "sufficient" and "good".

5.5.1.2 Percentage of English learned in- and outside school

The participants were asked to indicate how much English they believed they learned inside and outside school. They indicated this in categories of percentages, running for 0% to 100% in steps of 25%. This question was asked during measurements 1 and 3. Table 3 shows the mean percentage per measurement.

Table 3. Percentage of English learned in- and outside school (N=77).

		Percentage English learned inside school			Percentage English learned outside school		
		N	Mean	SD	N	Mean	SD
Time 1	EB	33	56.06	21.68	33	37.88	23.49
	LB	41	55.49	24.05	41	42.68	24.52
Time 3	EB	34	52.94	22.83	34	46.32	23.14
	LB	38	46.71	22.64	38	51.32	23.93

Table 4. Multilevel regression model - Percentage of English learned in- and outside school.

	Percentage English learned inside school		Percentage English learned outside school	
	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	74.43 (540.29)	.000*	73.92 (346.03)	.000*
L1	74.43 (0.38)	.538	73.92 (0.99)	.323
Time	71.38 (4.05)	.048*	71.02 (7.92)	.006*
L1 * Time	71.38 (0.76)	.387	71.02 (0.05)	.820

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors. What is striking is that there is huge dispersion within both participant groups: the SD is between 21 and 25. However, the means do not differ between EB and LB and therefore the main factor *L1* was non-significant for both the percentage of English learned inside school and for the percentage of English learned outside school.

The main factor *Time* was significant for both the percentage of English learned inside and outside school. The effect sizes were small at d = .35 for percentage of English learned inside school. LB indicated that they learned less English inside school from measurement 1 to 3, a decrease of almost 10% whilst EB only showed a non-significant drop of 3%. The effect size for the percentage of English learned outside school was also small at d = -.32. EB indicated they learned more English outside school from measurement 1 to 3, a growth of almost 9% whilst LB showed a non-significant increase of 7.5%.

5.5.1.3 Main conclusions self-assessment of language proficiency

This chapter dealt with the question whether EB and LB differ on their self-assessment of language proficiency and this can be partly answered positively. Several expectations were formulated that are discussed.

The first expectation was that EB rate themselves higher on Frisian proficiency and EB and LB rate themselves similarly on Dutch and English proficiency. And indeed, EB rate all four Frisian language skills significantly higher than LB. Ratings on Dutch and English are however not similar between EB and LB, which is opposite to what was expected. LB rate their Dutch speaking and listening skills and their English reading and writing skills higher than EB. The second expectation was that there would be no gender differences in the rating of Frisian, Dutch and English proficiency. This is partly confirmed by the results. The only difference for Frisian is that girls rate their listening skills higher than the boys do. For the Dutch language skills, there are no differences. For the English language skills however, boys rate themselves higher on all four language skills than girls.

The third and final expectation was that the rating of self-assessment of language proficiency would increase during the school year. This is partly confirmed by the results. EB rate their Frisian reading and English reading and writing skills gradually higher during the school year whilst rating their Dutch writing skills gradually slightly lower during the school year. LB rate their Frisian and Dutch writing skills gradually lower during the school year and their English writing and reading skills higher from measurement 1 to 2 but lower again from measurement 2 to 3.

5.5.2 EFL vocabulary test

The EFL vocabulary test was used to assess participants' English vocabulary knowledge, research question b, and compare EB and LB. It was expected that a) EB would score higher at the test than LB, b) there would be no gender differences and c) that the test scores would increase during the school year. As explained in chapter 3, section 3.3.3, the EFL vocabulary test was used to test these hypotheses. First of all, the results of the test were analysed. Figure 1 shows that both participant groups start at the same level of a 60% correct score. From there both groups show a different path. Where LB gradually improve in their test results, EB show a drop in results at 55% at measurement 2 followed by a steep growth towards measurement 3, matching LB's results of around 70%.

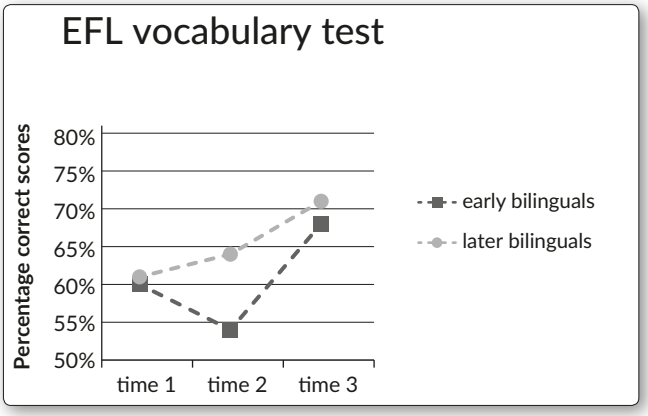


Figure 1. EFL vocabulary test scores per measurement

Table 5. Multilevel regression model - EFL vocabulary test.

EFL vocabulary test	r_c (υ)	*p*
Intercept	72.95 (1394.99)	.000*
L1	75.06 (0.65)	423
Time	53.21 (12.43)	.000*
L1 * Time	53.11 (2.27)	.113
Gender	73.69 (8.33)	.005*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The scores were analysed using a multilevel regression model with *L1*, *Gender* and *Time* as fixed factors. Figure 1 and table 5 show that *L1* was not a significant factor and therefore the first expectation - that EB would score higher at the test than LB - was not met. *Gender* and *Time* were significant factors. The effect size for *Gender* was medium at d = .55. Boys did significantly better on the test with an average of 9 words more correct than girls over the three measurements. This implies that the second hypothesis - that there would be no gender differences - was also not met. Finally, the effect sizes for *Time* were small at d = -.21 from measurement 1 to 2, small at d = -.42 from measurement 2 to 3 and medium at d = -.63 from measurement 1 to 3. For EB *Time* was significant from time 2 to 3 with a growth in correct scores of 14 words and for LB *Time* was significant from *Time* 1 to 3 with a growth in correct scores of 11 words. This means that the third hypothesis - that the test scores would increase during the school year - was met.

5.5.3 Picture story task

The picture story task was used to assess participants' oral language proficiency in Frisian, Dutch and English, research question c, and to compare EB and LB. Several expectations were formulated, which will be discussed in the following sections per part that was looked at: fluency, fluency strategies and lexical richness, but first text length is discussed..

5.5.3.1 Text length

The analysis of the picture story tasks started with the text length per language per measurement. In this analysis, any breakdown and repair fluencies (e.g. repetitions, filled pauses, etc.) were excluded. Transfer, prompts and errors were included. Figure 2 shows the average number of words per language over the three measurements and figures 3 to 5 show the number of words per measurement per language.

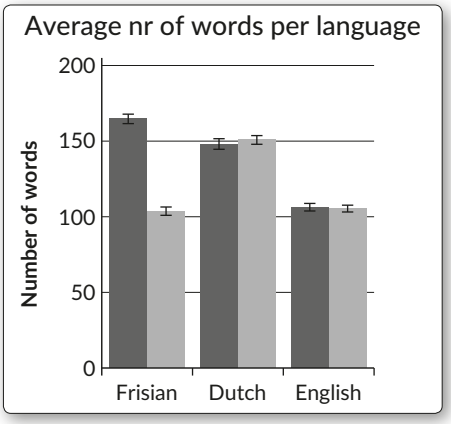


Figure 2. Average number of words per language

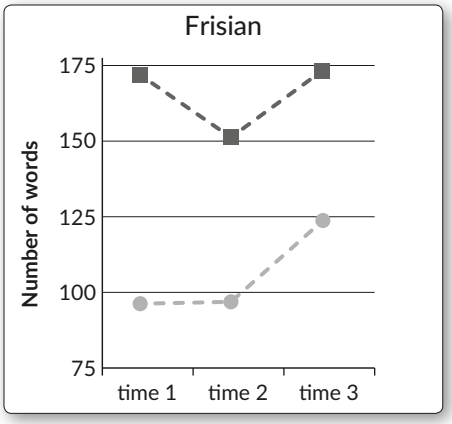


Figure 3. Number of words per measurement for the Frisian picture story task

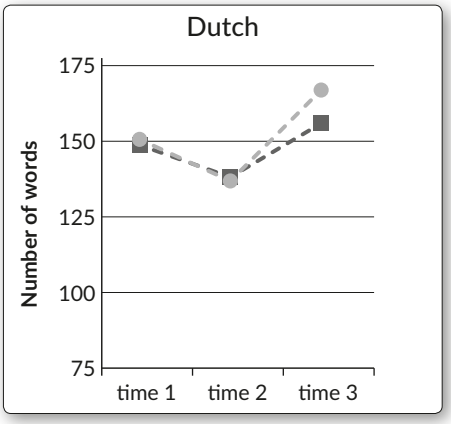


Figure 4. Number of words per measurement for the Dutch picture story task

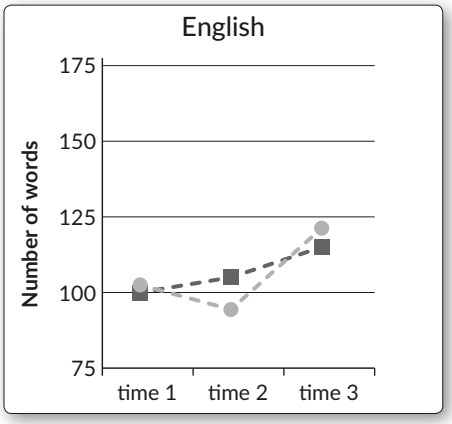


Figure 5. Number of words per measurement for the English picture story task

Table 6. Multilevel regression model - Number of words per language.

	Frisian		Dutch		English	
Number of words	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	73.88 (1002.85)	.000*	73.25 (1050.04)	.000*	76.10 (987.74)	.000*
L1	73.88 (52.47)	.000*	73.25 (0.12)	.726	76.10 (0.02)	.894
Time	65.45 (14.50)	.000*	56.82 (14.27)	.000*	67.12 (19.42)	.000*
L1 * Time	65.45 (2.20)	.119	56.82 (0.71)	.494	67.12 (4.75)	.012

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors. Table 6 shows the results per language. *L1* was significant for Frisian and had a large effect size of *d* = 1.16. EB used on average almost 50 words more per picture story task than their LB peers. For Dutch and English *L1* was not significant: EB and LB used about the same number of words per Dutch and English picture story tasks, around 150 and 105 words respectively.

The second main factor that was calculated was the impact of *Time*. *Time* was significant for all three languages. For Frisian, *Time* was significant for EB from time 2 to 3 (153 and 172 words). The effect size was medium at *d* = -.66. They had the same number of words for time 1 and 3 (171 and 172 words). *Time* was also significant for LB from time 1 (94 words) and 2 (94 words) to 3 (122 words) with medium effect sizes of *d* = -.66 and *d* = -.67 respectively. For Dutch, both EB and LB had a significant difference in number of words from time 2 (139 and 137 words) to time 3 (158 and 167 words) where the highest number of words was used. The effect size was medium at *d* = -.64. From time 1 to time 2 there was a drop in the number of words (time 1: 148 and 151 words). For English, *Time* was only significant for LB: between time 1 (103 words) and 2 (94 words) to time 3 (121 words). The effect sizes were medium from time 1 to 3 at *d* = -.56 and large from time 2 to 3 at *d* = -.81. EB had a gradually increasing number of words (from 100 to 115) per measurement but this was non-significant. Lastly, table 6 shows that the two-way interaction between *L1* and *Time* was significant for English only and non-significant for Frisian and Dutch.

5.5.3.2 Fluency

For the fluency part the following hypotheses were formulated: i) EB have less disfluencies in Frisian and English and a similar number of disfluencies in Dutch compared to LB, ii) there are no gender differences in the number of disfluencies for Frisian, Dutch and English, iii) participants show a decrease in the number of disfluencies during the school year. Fluency was measured by looking at the number of filled pauses, repetitions, retracings, reformulations, trailing offs and self-completed sentences.

The figures in the following sections show all the breakdown and repair fluencies per language for both participant groups. All analyses were performed using a multilevel regression models, as shown in the tables. The models used *L1* and *Time* as fixed factors. *Gender* was left out because it was not a significant predictor in any of the analyses. Also, there was no influence of language contact nor attitudes and motivation towards languages and language learning, which is why these were left out as covariates. What was included as a covariate for all three languages, was

the average number of words per text over the three measurements. For English, also the influence of L1 was taken into account as a covariate. Effect sizes were calculated using Cohen's d_s.

5.5.3.2.1 Number of filled pauses

The average numbers of filled pauses per language are shown in figure 6. The figure shows that both groups used filled pauses the most in L3 English (15 and 17.5 respectively for EB and LB) and the least in Dutch (2 and 3 respectively). LB had more filled pauses than EB in all three languages but the results in table 5 show this was only a significant difference for Dutch. The effect size was small at d = -.24. *Time* was also only significant for Dutch, for time 2 (see figure 6). The effect sizes were medium: from time 1 to 2 it was d = -.50 and from time 2 to 3 it was d = .59. Table 7 shows that the two-way interaction between *L1* and *Time* was significant for Frisian. Table 7 also shows that the *average number of words* was a significant predictor for all three languages with small effect sizes of d = .01 for Frisian and Dutch and d = .06 for English. For English, the covariate *Filled Pauses L1* was also significant and had a small effect size of d = .04.

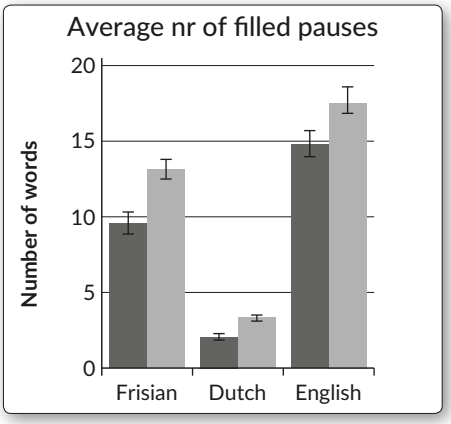


Figure 6. Average number of filled pauses per language

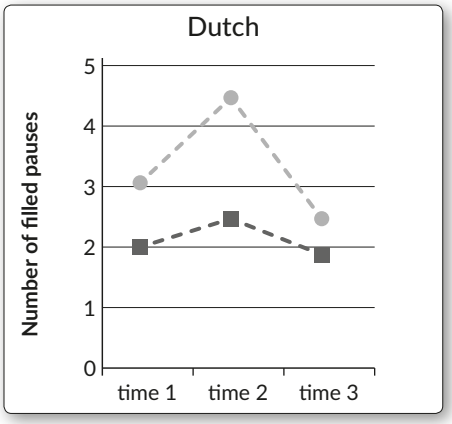


Figure 7. Number of filled pauses per measurement for the Dutch picture story task

Table 7. Multilevel regression model - Number of filled pauses per language.

	Frisian		Dutch		English	
Filled pauses	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	166.59 (0.40)	.529	148.77 (5.54)	.020*	160.37 (1.64)	.202
L1	89.87 (3.10)	.082	71.33 (4.71)	.033*	121.31 (0.72)	.397
Time	66.25 (1.68)	.193	59.80 (6.22)	.004*	74.06 (0.07)	.935
L1 * time	64.57 (3.26)	.045*	56.25 (1.89)	.161	67.24 (1.43)	.246
Average nr of words	156.13 (29.50)	.000*	138.86 (43.67)	.000*	146.65 (9.42)	.003*
Filled pause L1	X	X	X	X	151.25 (29.62)	.000*
L1 * Filled pause L1	X	X	X	X	149.50 (0.05)	.818

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

5.5.3.2.2 Number of repetitions, retracings and reformulations

Table 8 shows the mixed model analysis for the repetitions and retracings per language. Since reformulations were on average found less than once per measurement per participant group, these are not further mentioned here. Figures 8 to 11 show the results of the analysis for the number of repetitions. As can be seen in figures 8 and 9 and in table 8, *L1* was a significant predictor for the number of repetitions in Frisian. The effect was small at *d* = -.48. On average EB had 1.5 repetitions whereas LB had 5 repetitions. *Time* was significant for the number of repetitions in the Dutch and English picture story tasks. For Dutch, effect sizes were all small at *d* = .10 from time 1 to 2, at *d* = -.44 from time 2 to 3 and at *d* = -.34 from time 1 to 3. For English, effect sizes were small at *d* = -.35 from time 1 to 2, medium at *d* = .60 from time 2 to 3 and small at *d* = .25 from time 1 to 3. In Dutch participants used more repetitions each measurement and in English less repetitions each measurement. Table 8 shows that the two-way interaction between *L1* and *Time* was significant for Frisian and Dutch. The *average number of words* was a significant covariate for Dutch and English as can be seen in figures 10 and 11. Effect sizes were small at *d* = .01 for both languages. Finally, the influence of the number of *repetitions in L1* was significant for the English number of repetitions, as can be seen in table 8. The effect size was small at *d* = .12.

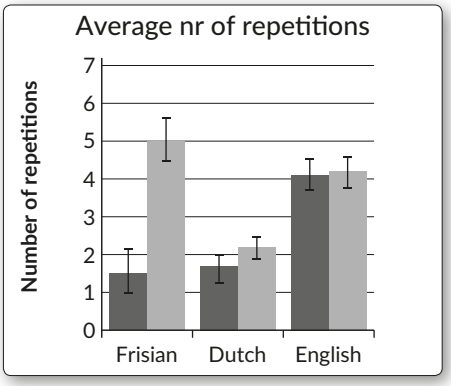


Figure 8. Average number of repetitions per language

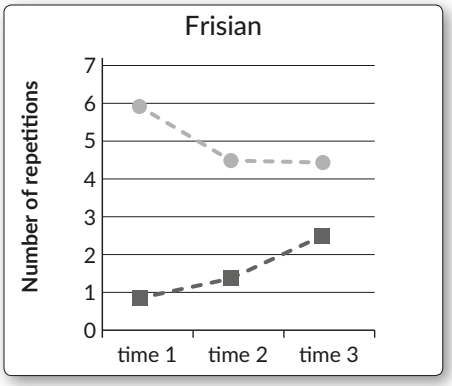


Figure 9. Number of repetitions per measurement for the Frisian picture story task

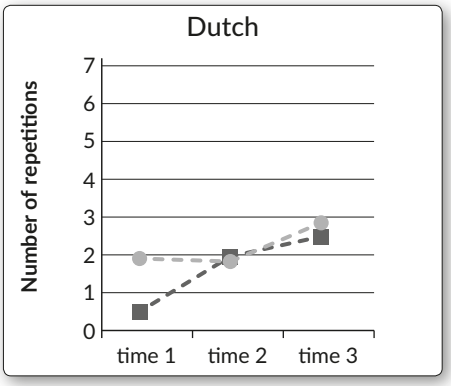


Figure 10. Number of repetitions per measurement for the Dutch picture story task

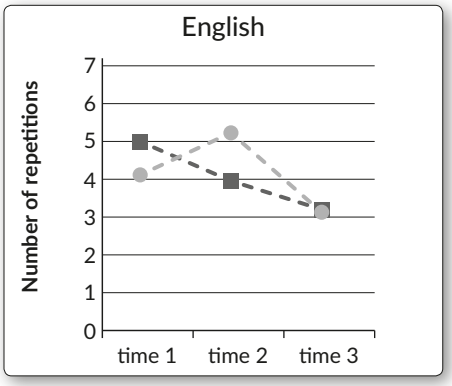


Figure 11. Number of repetitions per measurement for the English picture story task

Table 8. Multilevel regression model - Number of repetitions and retracings per language.

	Frisian		Dutch		English	
Repetitions	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	142.77 (2.75)	.099	125.42 (0.71)	.401	124.94 (0.66)	.419
L1	95.73 (11.67)	.001*	74.84 (1.86)	.177	103.64 (0.08)	.780
Time	60.73 (0.66)	.521	68.98 (8.52)	.000*	69.07 (4.07)	.021*
L1 * time	61.01 (4.16)	.020*	66.44 (3.76)	.028*	66.77 (2.19)	.120
Average nr of words	126.63 (2.85)	.094	118.56 (27.84)	.000*	144.42 (20.52)	.000*
Repetition L1	X	X	X	X	138.00 (9.37)	.003*
L1 * Repetition L1	X	X	X	X	133.41 (0.02)	.878

Retracings	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	141.17 (1.04)	.311	134.37 (7.64)	.007	128.28 (1.54)	.216
L1	98.34 (4.69)	.033*	69.26 (0.68)	.414	134.59 (0.22)	.639
Time	70.23 (0.24)	.788	70.68 (0.98)	.381	69.15 (5.23)	.008*
L1 * time	69.14 (1.78)	.176	66.02 (0.45)	.639	67.01 (1.83)	.169
Average nr of words	133.12 (15.72)	.000*	136.84 (63.94)	.000*	138.10 (16.53)	.000*
Retracing L1	X	X	X	X	152.71 (8.04)	.005*
L1 * Retracing L1	X	X	X	X	161.44 (0.30)	.585

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The average number of retracings per language is shown in figure 12. The figure shows that the largest number of retracings was in English (5.3 and 4.6 respectively for EB and LB) and in Dutch the least (2.75 and 3 respectively). The difference for Frisian was significant for *L1* but had a small effect size of *d* = -.16. LB used on average 1.3 more retracings than EB. *Time* was only significant for English, for time 2 as figure 13 shows. From time 1 to 2 the effect size was small at *d* = -.03 and from time 2 to 3 it was small at *d* = .26. Furthermore table 8 shows that the *average number of words* was a significant covariate for all three languages. The effect sizes for the languages were all small at *d* = .01. For English, the covariate *Filled Pauses L1* was also significant and had a small effect size of *d* = .09.

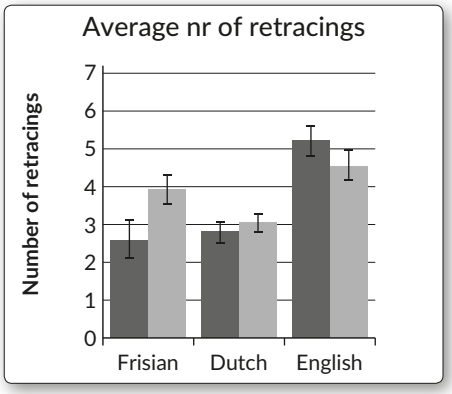


Figure 12. Average number of retracings per language

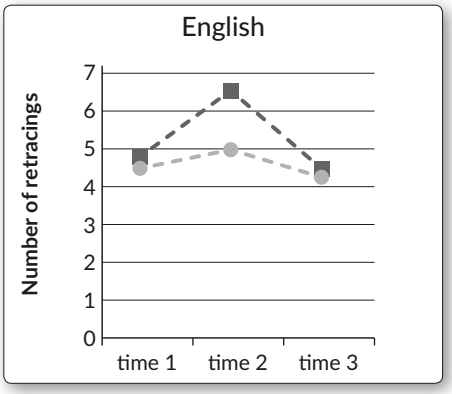


Figure 13. Number of retracings per measurement for the English picture story task

5.5.3.2.3 Number of trailing offs and self-completed sentences

The multilevel regression analyses for the number of trailing offs and self-completions per language are shown in table 9. *L1* was a significant predictor for the number of trailing offs in Frisian and Dutch, as can also be seen in figure 14. The effect sizes were both small at d = -.17 and at d = -.37 respectively. For both languages EB had a lower number of trailing offs than LB (0.11 against 1.50 for Frisian and 0.06 against 0.21 for Dutch). *Time* was significant for Frisian only, as figure 15 shows. LB went from 2.6 trailing offs to 0.7 trailing offs between the first and third measurement whereas EB stayed around 0.1 trailing offs all measurements. The effect size from time 1 to 3 was large at d = .96. Table 9 shows that the two-way interaction between *L1* and *Time* was significant for Frisian and English. Finally, the *average number of words* was only significant for Dutch and had a small effect size of d = .00.

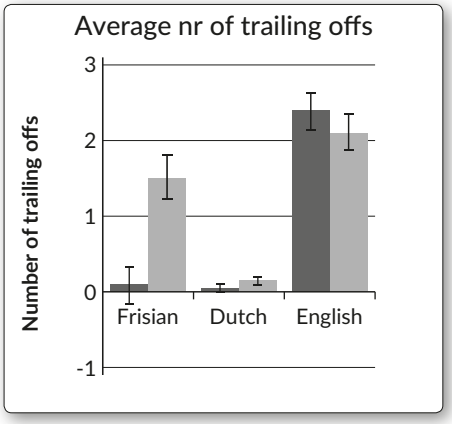


Figure 14. Average number of trailing offs per language

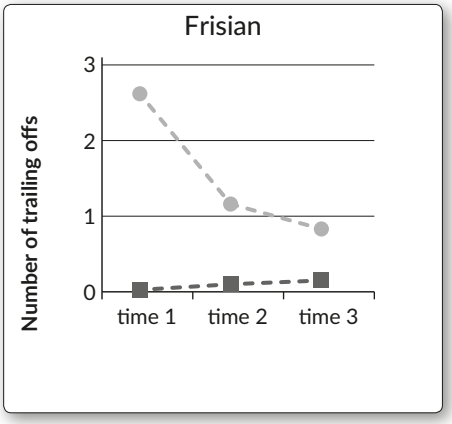


Figure 15. Number of trailing offs per measurement for the Frisian picture story task

Table 9. Multilevel regression model - Number of trailing offs and self-completions per language.

	Frisian		Dutch		English	
Trailing offs	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	158.74 (1.62)	.206	125.38 (1.50)	.223	144.98 (13.75)	.000*
L1	91.13 (9.63)	.003*	57.74 (5.61)	.021*	80.75 (0.10)	.756
Time	68.68 (4.96)	.010*	61.01 (0.47)	.626	68.66 (1.22)	.303
L1 * time	63.63 (6.99)	.002*	58.10 (0.35)	.709	64.03 (3.41)	.039*
Average nr of words	103.75 (1.94)	.167	128.16 (7.16)	.008*	137.46 (0.02)	.878
Trailing off L1	X	X	X	X	121.65 (2.05)	.155
L1 * Trailing off L1	X	X	X	X	121.66 (1.66)	.200
Self-completions	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	159.19 (4.41)	.037*	X	X	145.90 (19.19)	.000*
L1	89.89 (9.39)	.003*	X	X	76.05 (0.18)	.675
Time	72.52 (4.35)	.016*	X	X	75.88 (1.02)	.367
L1 * time	66.96 (5.78)	.005*	X	X	71.56 (3.81)	.027*
Average nr of words	105.32 (0.00)	.981	X	X	140.52 (0.81)	.370
Self-completion L1	X	X	X	X	129.06 (0.64)	.424
L1 * Self-completion L1	X	X	X	X	127.68 (1.20)	.276

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The number of self-completions in Dutch was too small for the multilevel regression analysis. *L1* was only a significant predictor for the number of self-completions in Frisian, as figure 16 shows. The effect size was small at *d* = -.25. On average EB had none self-completions and LB had 1.2. In English the number of self-completions was higher at around 2 but there were no differences between EB and LB. *Time* was significant for Frisian for LB from time 1 to 2 (large effect size *d* = .88) and from time 2 to 3 (small effect size *d* = -.07). Lastly, the two-way interaction *L1*Time* was significant for both Frisian and English.

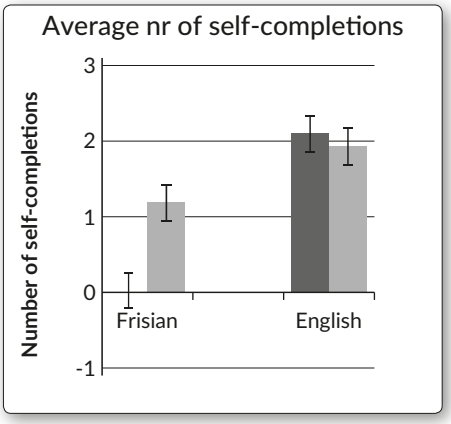


Figure 16. Average number of self-completions per language

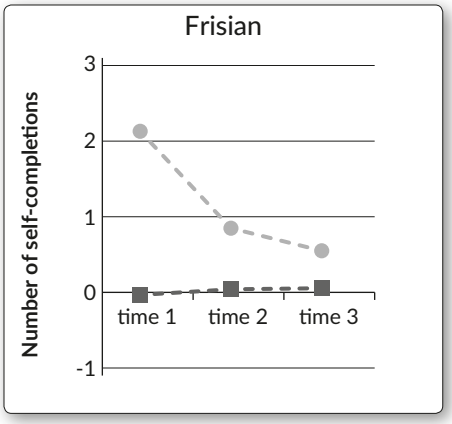


Figure 17. Number of self-completions per measurement for the Frisian picture story task

5.5.3.2 Main conclusions fluency

The outcomes of the analyses have shown that the first main factor *L1* almost exclusively plays a role in fluency in the Frisian picture story task. On the whole, LB have more disfluencies than EB (on all measures except filled pauses), which is in line with the first hypothesis. This result can easily be explained by the fact that for LB Frisian is their L2. *L1* plays a minor role in Dutch, shown in the number of filled pauses and trailing offs for which EB on average have a slightly lower number. This is different from what was expected in the first hypothesis since no differences between EB and LB were expected. In English, *L1* is never a significant predictor in the number of disfluencies shown by the participants, which is what was hypothesised in the first hypothesis. The second hypothesis was that no gender differences would be found in the number of disfluencies for Frisian, Dutch and English and this indeed the case. *Gender* is not a significant predictor in any of the analyses. The third hypothesis was that participants would show a decrease in the number of disfluencies during the school year. *Time* plays a role in most of the measured disfluencies. With a few exceptions, on the whole the number of disfluencies goes down from time 1 to 3 which is in line with the expectation. The most influential covariate is *average number of words* used per language which would imply that the length of the text influenced the results. However, the effect sizes for all measures and languages are small, implying that it has no major impact on the number of disfluencies. The *influence of L1* is also noticeable in some of the measures for English, for example in the number of filled pauses, repetitions and retracings.

This implies that part of the results can be explained by speaking style of the participants. However, again the effect sizes are all small which questions the magnitude the disfluencies caused by speaking style really have on the number of English disfluencies. What is most striking about the influence of *Time* is that time 2 shows a rise in almost every fluency measure. At time 2 the third group of participants was added, as explained in chapter 3, and this seems to influence the results. On the whole, time 3 shows a downward trend again for most fluency measures, showing fewer disfluencies. Finally, comparing the fluency in the three languages to each other, reveals that most disfluencies are in English. Especially the number of retracings was much higher compared to the other two languages.

5.5.3.3 Lexical fluency strategies

For the lexical fluency strategies part the following expectations were formulated:

i) EB make less use of lexical fluency strategies in Frisian and English and a similar number of lexical fluency strategies in Dutch compared to LB,
ii) there are no gender differences in the use of fluency strategies for Frisian, Dutch and English,
iii) participants show a decrease in the number of fluency strategies used during the school year. Lexical fluency strategies were measured by looking at number of transfers, prompts, neologisms and lexical and grammatical errors.

All analyses were performed using a multilevel regression model, which are shown in the tables. The models used *L1* and *Time* as fixed factors. *Gender* was also added as a fixed factor wherever it was a significant predictor in the analyses. Since there was no influence of language contact and attitudes and motivation towards languages and language learning, these were left out as covariates. The average number of words per text over the three measurements was included as a covariate for all three languages. Effect sizes were calculated using Cohen's $d_{s.}$

5.5.3.3.1 Number of transfers

The first measured feature for lexical fluency strategies was the number of transfers. Transfer was only used in the Frisian and English picture story tasks. In the Frisian picture story task Dutch was used and in the English picture story task both Frisian and Dutch were used. The multilevel regression model included fixed factors *L1, Time* and *Gender* (only for Dutch transfers in English and total number of transfers in English). Furthermore, the covariate *average number of words* was included.

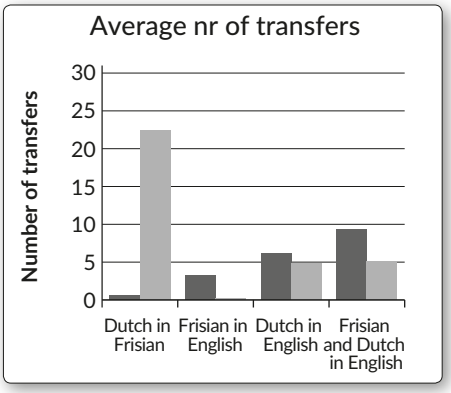


Figure 18. Average number of transfers per language

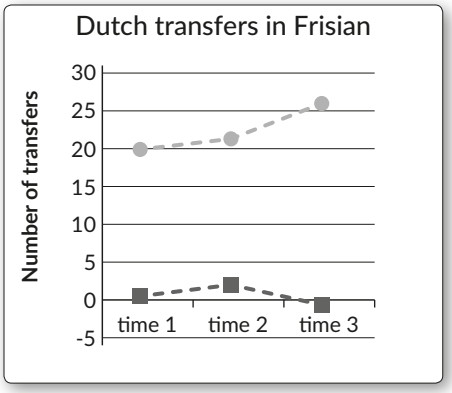


Figure 19. Number of Dutch transfers per measurement for the Frisian picture story task

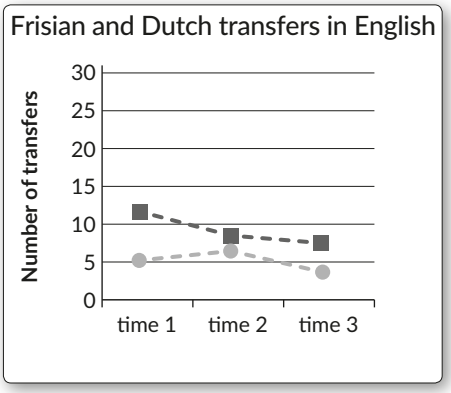


Figure 20. Number of Frisian and Dutch transfers per measurement in the English picture story task

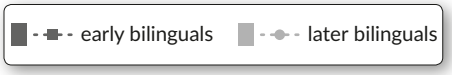


Table 10. Multilevel regression model - Number of transfers.

	Dutch in Frisian		Frisian in English		Dutch in English		Frisian and Dutch in English	
Transfer	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	163.16 (0.85)	.359	*148.99 (9.27)*	*.003**	*106.92 (5.73)*	*.018**	122.09 (5.10)	.026*
L1	93.86 (78.14)	.000*	*69.65 (42.20)*	*.000**	*62.87 (0.08)*	*.775*	63.79 (3.81)	.055
Time	67.72 (1.27)	.287	*54.84 (4.79)*	*.012**	*64.44 (1.03)*	*.362*	63.94 (2.31)	.108
L1 * Time	65.27 (4.11)	.021*	*50.94 (3.75)*	*.030**	*60.63 (0.62)*	*.540*	58.86 (1.23)	.300
Gender	X	X	X	X	*59.32 (8.31)*	*.005**	63.80 (7.56)	.008*
Average nr of words	146.93 (18.26)	.000*	*115.70 (0.87)*	*.353*	*106.01 (0.00)*	*.985*	122.01 (0.49)	.487

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

L1 was a significant predictor for the Frisian picture story task. The effect size was large at *d* = -2.24 for the number of Dutch transfers in Frisian. As figure 18 and table 10 show LB used many Dutch transfers, nearly 22 more on average than EB. *L1* was also significant for Frisian transfers in English and almost significant (*p* = .055) for Frisian and Dutch transfers in English taken together. The effect size for Frisian transfers was large at *d* = 1.22 and small at *d* = .43 for Frisian and Dutch transfers together. In the English picture story task EB used more transfers than LB, 4 more on average. One third of EB's transfers were Frisian and two third were Dutch. LB almost only used Dutch transfers in the English picture story tasks. *Gender* was a significant predictor for Dutch transfers in English. Girls had on average 4 Dutch transfers more than boys in English. *Gender* was also a significant predictor for Frisian and Dutch transfers together in English. Girls had on average 5 Frisian and mostly Dutch transfers more in English compared to boys. *Time* was significant for Frisian transfers in the English task and had small effect sizes at *d* = -.09 from time 1 to 2, *d* = .21 from time 2 to 3 and *d* = .13 from time 1 to 3. At time 1 EB used 4.5 Frisian transfers and in time 2 and 3 around 2.5 transfers. The two-way interaction *L1*Time* was significant for the Dutch transfer in the Frisian picture story task and for the Frisian transfers in the English picture story task. Finally, the influence of the covariate *average number of words* was a significant factor in the Frisian picture story task and had a small effect of *d* = .01.

5.5.3.3.2 Number of prompts

The second measured feature for lexical fluency strategies was the number of prompts. The multilevel regression model included fixed factors *L1* and *Time*. Furthermore, the covariate *average number of words* was included.

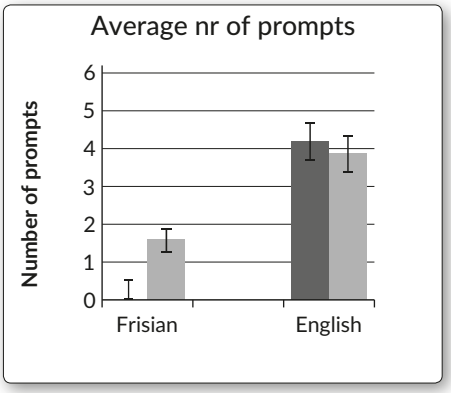


Figure 21. Average number of prompts per language

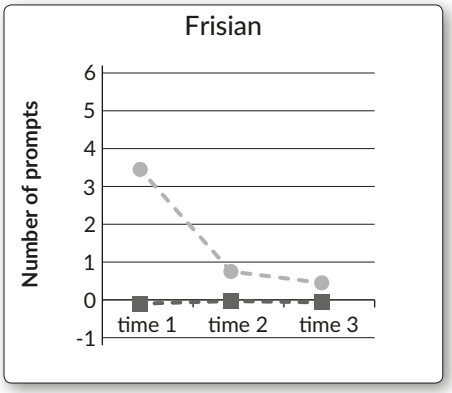


Figure 22. Number of prompts per measurement for the Frisian picture story task

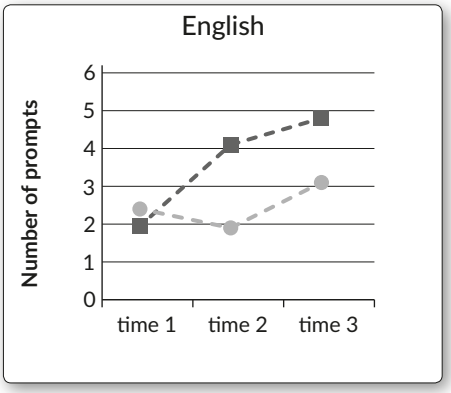


Figure 23. Number of prompts per measurement for the English picture story task

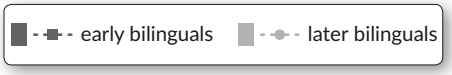


Table 11. Multilevel regression model - Number of prompts.

	Frisian		English	
Prompts	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	144.26 (0.99)	.321	132.55 (9.08)	.003*
L1	74.06 (13.09)	.001*	74.56 (2.14)	.148
Time	56.33 (4.79)	.012*	77.31 (4.69)	.012*
L1 * Time	53.47 (4.84)	.012*	72.90 (3.67)	.030*
Average nr of words	99.96 (2.85)	.095	126.07 (0.01)	.945

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Prompts were only used in Frisian and English, as figures 21 to 23 and table 11 show. Figure 21 shows that prompts were mostly used in English by EB. On average, they used one prompt more than LB, which was however not significantly more. The difference in use of prompts for Frisian was significant for *L1* with a small effect size of *d* = -.16. LB used on average 1.5 prompts whereas EB needed no prompts. *Time* was significant for both languages. Effect sizes were large at *d* = 1.32 from time 1 to 2 and large at *d* = 1.39 from time 1 to 3 for Frisian. In the first measurement for Frisian LB needed many more prompts compared to time 2 and 3. For English effect sizes were small at *d* = .18 from time 1 to 2, small at *d* = -.36 from time 2 to 3 and small at *d* = -.18 from time 1 to 3. For English, more prompts were needed by both groups in time 3 compared to times 1 and 2. The two-way interaction *L1*Time* was also significant for both languages.

5.5.3.3.3 Number of neologisms

The use of neologisms was the third feature that was measured. Examples of neologisms used in Frisian were 'twaje' for 'trije' to say 'three'. Interestingly 'twa' means 'two' in Frisian but the 'je' is only used for 'trije'. Another example was 'trien' for 'trein' meaning 'train' and 'skoan' for 'skoen' meaning 'shoe'. It seems that in these examples the participants had trouble finding the right pronunciation for the words. A final example was 'weave' for 'wiuwe', meaning 'to wave'. In this example, the participant seemed to have used English as a source for the Frisian word. Examples of neologisms used in English were 'wand' used with an English pronunciation for 'wall' and from the Frisian and Dutch word 'wand' meaning 'wall'. Another example was 'klear' for 'finished' which is 'klear' in Frisian but in this case pronounced with a Frisian 'k' and English 'lear'. Another example was 'drêf' for 'run', probably derived from the Frisian and Dutch word 'draven' meaning 'running'. A final example was the use of different words for 'legs' of a table: 'paots', 'lengs' and 'planks'.

The use of neologisms only occurred in Frisian and English. The multilevel regression model included fixed factors *L1* and *Time*. Furthermore, the covariate *average number of words* was included.

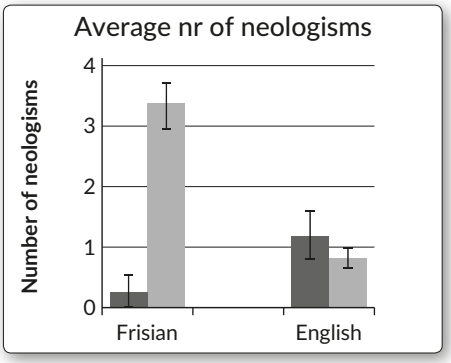


Figure 24. Average number of neologisms per language

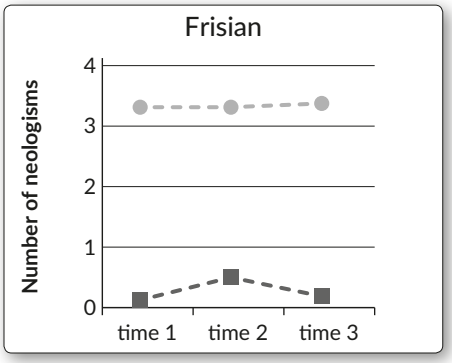
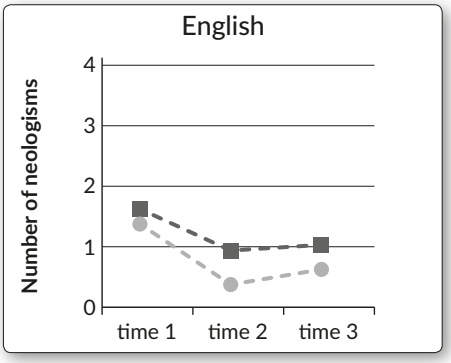


Figure 25. Number of neologisms per measurement for the Frisian picture story task



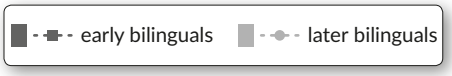


Figure 26. Number of neologisms per measurement for the English picture story task

Table 12. Multilevel regression model - Number of neologisms.

	Frisian		English	
Neologisms	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	160.88 (6.50)	.012*	117.37 (3.27)	.073
L1	98.94 (30.97)	.000*	64.07 (2.48)	.120
Time	77.44 (0.16)	.857*	71.07 (4.27)	.018*
L1 * Time	74.54 (0.17)	.842	67.12 (0.11)	.901
Average nr of words	159.36 (0.19)	.660	113.28 (0.98)	.326

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

What is most striking from the results shown in figures 24 to 26 and table 12 is that most neologisms were used by LB in Frisian. This was the case during all three measurements. *L1* was a significant factor here and had a large effect size of *d* = -1.17. In English, the difference between the two participant groups was smaller and *L1* was not a significant predictor. *Time* also played a significant role but only for English. Effect sizes were medium from time 1 to 2 at *d* = .57, small at *d* = -.18 from time 2 to 3 and small at *d* = .38 from time 1 to 3. At time 1 between 0.5 and 1 more neologisms were used compared to times 2 and 3 by both participant groups. The two-way interaction *L1*Time* was significant for both Frisian and English.

5.5.3.3.4 Number of lexical errors

The number of lexical errors was the fourth feature measured for lexical fluency strategies. The most commonly made lexical error was the use of 'she' instead of 'they' in English, appearing 280 times in the 194 picture story tasks. Another error that was often made was the use of 'will' instead of 'want' (51 times). A final example was the use of 'paws' or 'feet' for 'legs' of a table.

The multilevel regression model included fixed factors *L1* and *Time*. *Gender* was included as a fixed factor for English only. Furthermore, the covariate *average number of words* was included.

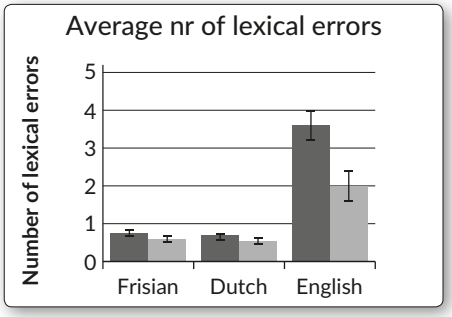


Figure 27. Average number of lexical errors per language

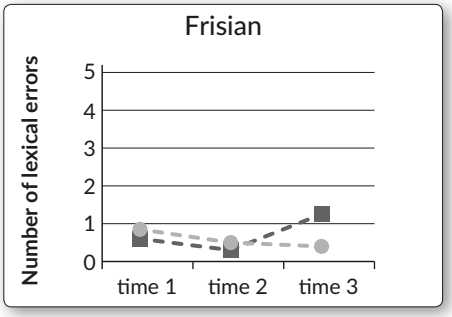


Figure 28. Number of lexical errors per measurement for the Frisian picture story task

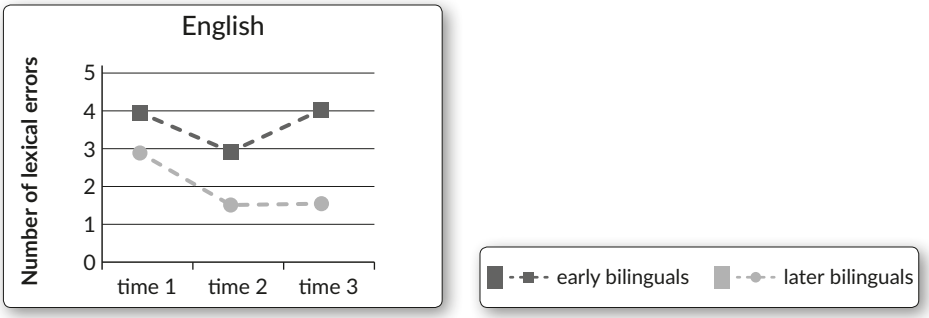


Figure 29. Number of lexical errors per measurement for the English picture story task

Table 13. Multilevel regression model - Number of lexical errors.

	Frisian		Dutch		English	
Lexical errors	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	118.52 (2.02)	.158	143.78 (1.68)	.198	119.19 (0.88)	.350
L1	77.67 (0.93)	.337	67.99 (01.18)	.282	69.14 (7.27)	.009*
Time	67.33 (5.37)	.007*	62.54 (2.21)	.118	68.65 (4.61)	.013*
L1 * Time	64.15 (8.40)	.001*	60.16 (0.38)	.683	64.71 (1.36)	.265
Gender	X	X	X	X	75.62 (11.83)	.001*
Average nr of words	121.50 (4.09)	.045*	149.01 (19.44)	.000*	118.46 (9.39)	.003*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Figure 27 shows that most lexical errors were made in English. *L1* was a significant factor here and had a large effect size of *d* = .84. EB made more lexical errors than LB (average 3.5 against average 2). *Time* was a significant factor for Frisian as figures 28 and table 13 show. This is due to EB making more lexical errors than their LB peers in time 3. The effect sizes were small at *d* = .13 from time 2 to 3 and *d* = .46 from time 1 to 3. *Gender* was significant for the number of lexical errors in English only. One average girls made 1.5 lexical errors more than boys (3.5 against 2 lexical errors respectively) *Time* was also significant for English, where most errors were made in time 1. The effect size was small at *d* = .46 from time 1 to 2 and small at *d* = .44 from time 1 to 3. The two-way interaction *L1*Time* was only significant for Frisian. The covariate *average number of words* was significant for all three languages. The effect sizes were small with *d* = .00 for Frisian and *d* = .01 for Dutch and English.

5.5.3.3.5 Number of grammatical errors

Grammatical errors were the fifth and last feature for this category. Most grammatical errors were wrong prepositions, 'a' instead of 'an' or the other way around. Another error that appeared a lot was wrong subject-verb agreement as in 'then there come a man' and incorrect tense as in 'it is go raining'.

The multilevel regression model included fixed factors *L1* and *Time*. Furthermore, the covariate *average number of words* was included.

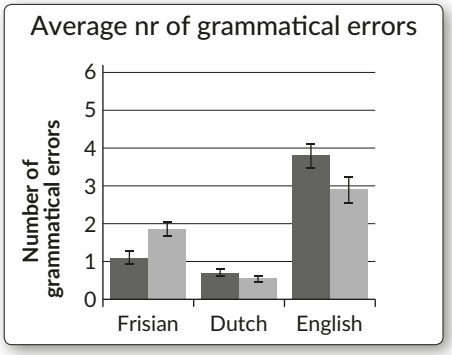


Figure 30. Average number of grammatical errors per language

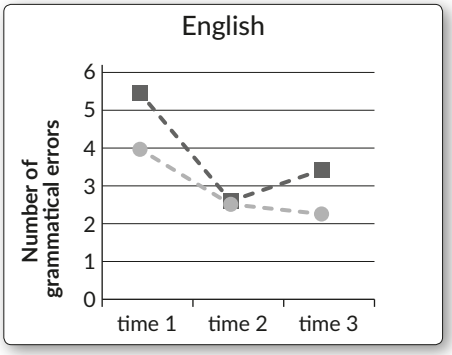


Figure 31. Number of grammatical errors per measurement for the English picture story task

Table 14. Multilevel regression model - Number of grammatical errors.

	Frisian		Dutch		English	
Grammatical errors	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	119.51 (10.02)	.002*	121.50 (0.00)	.973	104.81 (3.14)	.080
L1	79.30 (8.80)	.004*	68.97 (3.08)	.084	62.90 (4.85)	.031*
Time	74.02 (1.12)	.332	71.71 (0.91)	.405	62.75 (10.71)	.000*
L1 * Time	71.01 (1.38)	.258	69.85 (0.99)	.378	61.17 (1.69)	.193
Average nr of words	126.79 (1.46)	.230	124.46 (8.89)	.003*	100.29 (16.02)	.000*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Just as with the lexical errors, most grammatical errors were made in English (around 3 and 4 errors respectively for EB and LB). *L1* was significant for both Frisian and English as table 14 shows with a medium effect size of *d* = -.58 for Frisian and a small effect size of *d* = .43 for English. In Frisian, LB made more grammatical errors whilst in English EB made more grammatical errors. *Time* was only

significant for English. In time 1 more grammatical errors were made than in times 2 and 3 as figure 31 shows. The effect sizes were small at *d* = .46 from time 1 to 2 and small at *d* = .44 from time 1 to 3. The influence of *average number of words* was significant for Dutch and English but not for Frisian. Effect sizes were small at *d* = .00 for Dutch and *d* = .09 for English.

5.5.3.3.6 Total number of errors

Finally, the errors in the different categories (neologisms, lexical and grammatical errors) were added up and put into one category. The multilevel regression model included fixed factors *L1* and *Time*. Furthermore, the covariate *average number of words* was included.

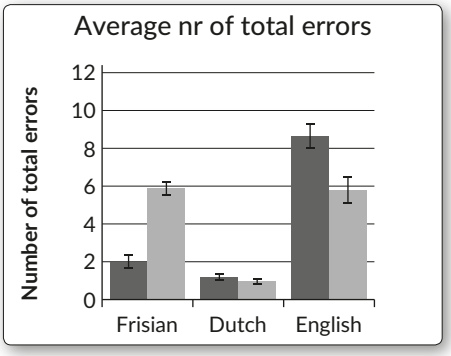


Figure 32. Average number of total errors per language

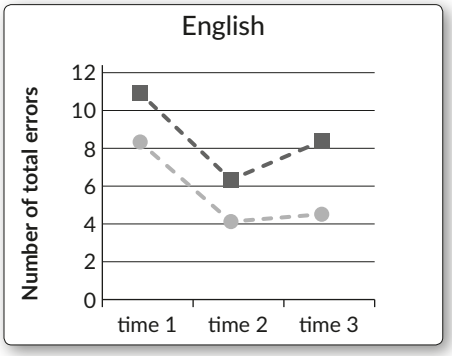


Figure 33. Number of total errors per measurement for the English picture story task

Table 15. Multilevel regression model - Total number of errors.

Total number of errors	Frisian		Dutch		English	
	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	152.13 (9.72)	.002*	132.74 (0.22)	.638	127.62 (7.03)	.009*
L1	96.13 (32.80)	.000*	71.23 (3.50)	.066	63.76 (10.42)	.002*
Time	74.49 (0.56)	.576	64.99 (1.03)	.362	59.69 (11.60)	.000*
L1 * Time	72.79 (1.12)	.332	63.04 (0.04)	.959	56.08 (0.85)	.434
Average nr of words	158.31 (3.68)	.057	137.21 (18.94)	.000*	125.59 (9.74)	.002*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Added up the main trends becomes very clear as shown in figures 32 and 33 and table 15. In Frisian, *L1* played a significant role and had a large effect size of d = -.93. On average LB made nearly 4 more errors than EB. In English, *L1* also played a significant role and had a medium effect size of d = .43. EB made on average nearly 3 errors more than LB. Although *Gender* was not a significant predictor in any of the languages, it is worth mentioning that it was nearly significant for English at p = .057. On average girls made 1.5 errors more than boys (8 errors against 6.5 respectively). *Time* only played a significant role in English where most errors were made in time 1 which was a significant difference with time 2. The effect size was medium at d = .53 from time 1 to 2. Finally, the influence of the covariate *average number of words* was significant for Dutch and English and had small effect sizes of d = .01 for both languages. For Frisian, this was nearly significant at p = .057.

5.5.3.3.7 Main conclusions for lexical fluency strategies

What the above has shown is that several lexical fluency strategies are used by both participant groups to narrate the picture story tasks. The use of these strategies differs per language and per participant group which implies that *L1* influences the results. In Dutch, no use is made of transfer, prompts or neologisms. Some lexical and grammatical errors are made but nothing remarkable. Nor are there differences between EB and LB, which is in line with what was hypothesised. For Frisian, the strategies are almost only used by LB, especially the use of Dutch transfers and neologisms is striking which they use even more in Frisian than in English. This result is in line with the first hypothesis. For English, EB make more use of transfer and make more lexical and grammatical errors than LB which is not in line with what was expected as it was hypothesised that EB would make less use of the strategies. The second hypothesis was that there would be no gender differences for the use of lexical fluency strategies. This is partly confirmed by the results since girls make more use of Dutch transfer and lexical errors in the English picture story task. The influence of *Time* is most noticeable in fluctuating results. Overall, in time 2 less use is made of the strategies whilst in time 3 more use is made of them again. The development over time plays a role for Frisian and English. For Frisian, time plays a role for LB. They make more use of Dutch transfers from time 1 to 3 but make less use of prompts from time 1 to 2. For English, on the whole, the strategies are used less by both groups from time 1 to 2. However, in time 3 a slight increase in the use is visible in most of the strategies but especially in the number of errors (neologisms, lexical and grammatical errors). So, development over time played an interesting role in the use of the strategies, especially for English. While at first participants make less use of the strategies in time 2 compared to time 1, they make more use of them again at time 3. This is not

in line with the third hypothesis, stating a decrease in the use of the strategies over time. The covariate *average number of words* also influenced the number of lexical fluency strategies used as in Dutch transfers in the Frisian picture story task and in the number of lexical and grammatical errors. However, the effect sizes were all small.

Based on the lexical fluency strategies analyses the research question on possible differences between EB and LB in the use of lexical fluency strategies in the three languages can be answered positively for Frisian and English. In Frisian, LB make more use of 4 out of the 5 strategies than EB. In English, it is the other way around and EB make more use of 3 out of the 5 strategies than LB. There are no differences between the two groups for Dutch, based on the use of the lexical fluency strategies. It is also interesting to take a closer look at how the lexical fluency strategies in the three languages compare to each other. On the whole, both participant groups use the strategies most for English and least for Dutch. However, LB use strikingly more transfer and neologisms for Frisian than for English. For Frisian, they use over 4 times more transfers and 3 times more neologisms than for English.

5.5.3.4 Lexical richness

For the lexical richness part the following expectations were formulated: i) EB have a higher lexical richness in Frisian and English and a similar lexical richness in Dutch compared to LB, ii) there are no gender differences in lexical richness for Frisian, Dutch and English and iii) participants show a higher lexical diversity during the school year. Lexical richness was measured by looking at lexical diversity, lexical sophistication and the proportion of errors.

5.5.3.4.1 Lexical diversity

Lexical diversity was measured using D. In the analyses breakdown and repair fluencies (e.g. repetitions, filled pauses, etc.) were excluded. Lexical fluency strategies such as prompts, transfer and errors were included. Due to time limitations, it was not possible to perform morphological analyses, which is why words with the same stem but different inflections were treated as different words, for example 'boy' and 'boys'.

The results were analysed using a multilevel regression model with *L1* and *Time* as fixed factors. Where it turned out to be a significant predictor the fixed factor *Gender* was added. Furthermore, attitudes and motivation towards languages and language learning and self-assessment of language skills were added as covariates where it turned out to be significant. For the analysis of VOCD for the English picture story task the amount of language contact and the EFL vocabulary test results were also added. The influence of the average text length was left out since VOCD already corrects for text length.

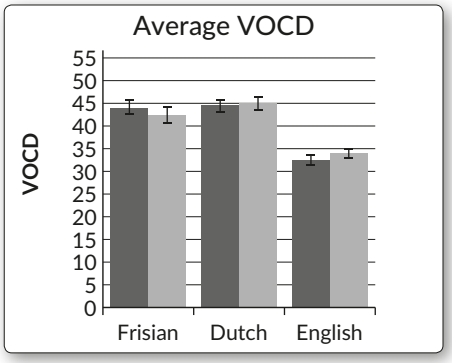


Figure 34. Average VOCD per language

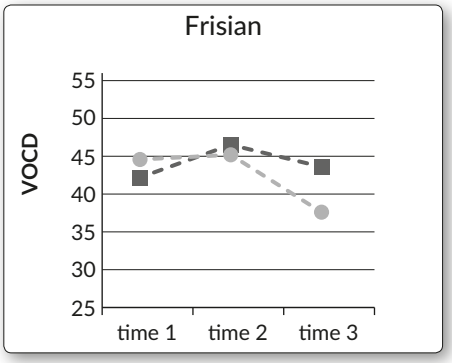


Figure 35. VOCD per measurement for the Frisian picture story task

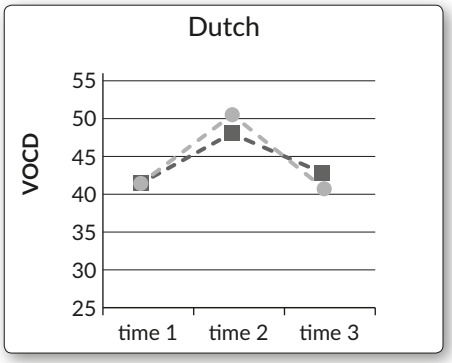


Figure 36. VOCD per measurement for the Dutch picture story task

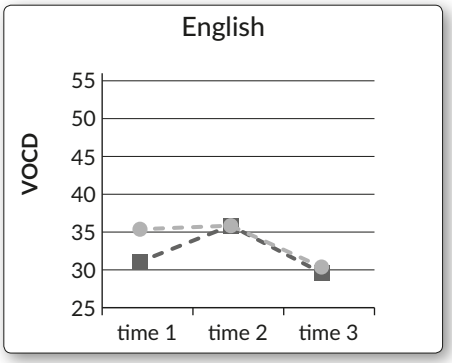


Figure 37. VOCD per measurement for the English picture story task

Table 16. Multilevel regression model - VOCD.

	Frisian		Dutch		English	
VOCD	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	122.43 (151.29)	.000*	175.76 (234.21)	.000*	117.43 (80.27)	.000*
L1	118.86 (0.09)	.768	73.04 (0.20)	.655	68.46 (0.47)	.494
Time	55.36 (7.07)	.002*	59.41 (21.30)	.000*	63.33 (10.30)	.000*
L1 * Time	55.22 (2.81)	.069	63.76 (1.38)	.259	63.24 (0.89)	.415
Enjoy speaking Frisian	148.08 (12.76)	.000*	X	X	X	X
Confident speaking Frisian	158.10 (7.34)	.007*	X	X	X	X
Enjoy speaking Dutch	X	X	168.91 (7.64)	.006*	X	X
English speaking skills	X	X	X	X	108.94 (10.40)	.002*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

Figure 34 shows that for the Frisian and Dutch picture story task both participant groups had similar lexical diversity at around 45 whereas for the English picture story task this was around 33 which implies a much lower lexical diversity in English. As can be seen in table 16 the main factor *L1* was not significant for any of the languages. *Time* on the other hand was. For Frisian, it was only significant for LB from time 1 to 3 (medium effect size *d* = .66) and from time 2 to 3 (medium effect size *d* = .63). For Dutch, it was significant for both EB and LB from time 1 to 2 and time 2 to 3. The effect sizes were all small at *d* = -.02 from time 1 to 2 and *d* = .04 from time 2 to 3. For English, time was significant from time 2 to 3 for both groups and had a medium effect size of *d* = .53. For all languages time 2 yielded the highest lexical diversity as figures 35 to 37 show. There were several covariates that correlated with the results per language. These were enjoy speaking Frisian and feeling confident speaking Frisian for the Frisian picture story task, enjoying speaking Dutch for the Dutch picture story task and English speaking skills for the English picture story task.

Since the data on lexical fluency strategies already showed that prompts and transfer were used a lot in the Frisian and English picture story tasks, the VOCD analysis was also performed excluding these features. Table 17 shows the percentage of words that was left out as a result of this. What is clear is that almost a quarter of the words used by LB in Frisian are Dutch transfers and prompts provided by the researcher / research assistant. For English, nearly 14% is left out for EB and 8% for LB. Hence it is worthwhile to analyse lexical diversity without these prompts and transfer.

Table 17. Proportion of prompts and transfer in percentages per language.

Language	EB	LB
Frisian	0.87%	24.82%
English	13.84%	8.06%

The analysis of lexical diversity without prompts and transfer could not be performed for all participants' picture story tasks as for some picture story tasks not enough tokens remained for random sampling. For Frisian 2 of the 199 picture story tasks were left out and for English 10 of the 194 picture story tasks.

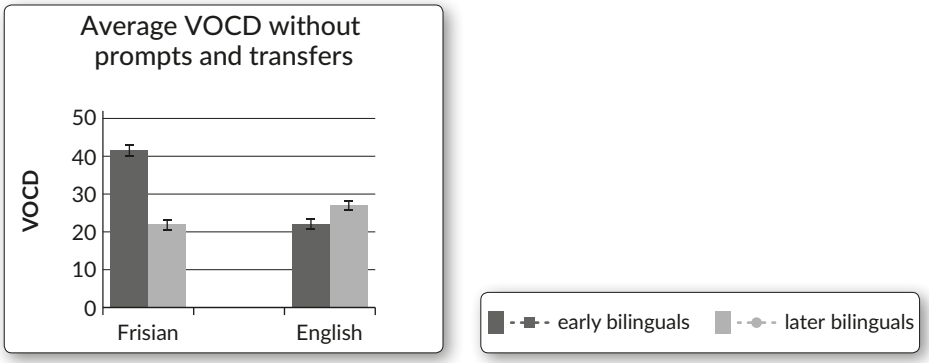


Figure 38. Average VOCD per language without prompts and transfer

Table 18. Multilevel regression model - VOCD without prompts and transfer.

VOCD without prompts and transfer	Frisian		English	
	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	129.01 (66.86)	.000*	141.10 (0.15)	.704
L1	116.45 (12.71)	.001*	65.94 (3.42)	.069
Time	49.70 (8.18)	.001*	55.86 (9.39)	.000*
L1 * Time	49.58 (1.27)	.291	50.02 (0.95)	.394
Gender	X	X	63.04 (4.53)	.037*
Enjoy speaking Frisian	153.54 (5.46)	.021*	X	X
Confident speaking Frisian	149.05 (17.08)	.000*	X	X
English speaking skills	X	X	141.71 (14.57)	.000*
Contact with English through digital media	X	X	137.13 (5.11)	.025*
EFL vocabulary test	X	X	139.58 (11.94)	.001*

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

As figure 38 and table 18 show the analysis of lexical diversity without prompts and transfer results in quite a different picture for both languages compared to the analysis of lexical diversity with prompts and transfer. *L1* becomes a significant predictor for Frisian with a large effect size of d = 1.96. Compared to LB, EB have a striking twice as high lexical diversity (42 against 24). When taking a closer look at the differences between LB, these are striking. Their lexical diversity scores range from 8.17 till 67.75. Mutual differences within the LB group were large. Only 8% has a lexical diversity score of 40 or higher. This implies that some LB barely know any Frisian while others seem to be rather fluent. In comparison, EB lexical diversity scores range from 21.38 till 66.09 with 61.3% reaching a lexical diversity score of 40 or higher. This implies, as one might expect, that this group is much more homogeneous in their lexical diversity level in Frisian. *Gender* becomes a significant predictor for English when prompts and transfers are left out of VOCD. Boys have a higher lexical diversity than girls (27.28 against 24.30 respectively). Covariates that correlate with Frisian VOCD are enjoying speaking Frisian and confident speaking Frisian. For English VOCD these are English speaking skills, contact with English through digital media and EFL vocabulary test scores.

5.5.3.4.2 Lexical sophistication

Lexical sophistication was measured by dividing the different wordtypes and wordtokens of the three measurements into 4 categories as shown in table 19.

Table 19. Four categories of wordtypes and wordtokens.

Frequency	
100 or more	type/token appears more than 100 times
50-100	type/token appears between 50 and 100 times
25-50	type/token appears between 25 and 50 times
0-25	type/token appears between 0 and 25 times

In the analyses disfluencies, transfer and prompts were left out. Percentages were calculated of the proportion of wordtypes and wordtokens per language for both participant groups taken together. Table 20 shows the results.

Table 20. Four categories of wordtypes and wordtokens for Frisian, Dutch and English

	Frisian		Dutch		English	
	Wordtypes	Wordtokens	Wordtypes	Wordtokens	Wordtypes	Wordtokens
100 or more	3.15%	60.05%	3.83%	61.44%	5.32%	67.07%
50-100	3.32%	11.37%	4.50%	13.83%	2.98%	8.22%
25-50	6.30%	10.79%	6.60%	10.11%	5.97%	8.41%
0-25	87.23%	17.79%	85.07%	14.62%	85.73%	16.30%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

What is most striking is that a small proportion of the '100 or more' category wordtypes (which is only 3-5%) is used between 60 and 67% of all utterances. Three words that appear in the top 5 in all three languages are 'the', 'and' and 'they'. The other big category is the 0-25 category. It has over 85% of all wordtypes but they make up 14-18% of all words that were used. These are words that are only used by a few of the participants, such as 'parents' (14 times), rails (12 times), ashamed (5 times) and obstacle (once). The main difference between the three languages is that in English a 7% higher percentage of high frequent words is used compared to Frisian and Dutch. In Frisian and Dutch words with a medium frequency of 50-100 and 25-50 times are used between 2-6% more compared to English. Words from the low frequency category, 0-25, are used least in Dutch, 2-3% less compared to Frisian and English.

5.5.3.4.3 Proportion of errors

For the analysis of the proportion of errors, the average number of words used per language for the three measurements was taken to calculate the percentage of the average number of errors. Table 21 shows the result of this analysis. The table shows that for Frisian the proportion of errors is twice as high for LB than for EB. For Dutch, the difference between the two participant groups is small. For English EB have 1.5 times more errors than LB. What is interesting is that LB have a similar amount of errors for Frisian and English whilst EB have 3 times as many errors in English compared to Frisian.

Table 21. Proportion of errors in percentages per language.

Language	EB	LB
Frisian	3.36%	6.07%
Dutch	1.99%	1.48%
English	9.21%	6.09%

5.5.3.4.4 Main conclusions lexical richness

The above results on lexical richness show that the biggest differences between the two participant groups are for Frisian. When prompts and transfer are left out of the calculation of VOCD EB have a twice as high lexical diversity as LB. This finding is in line with the first hypothesis. For Dutch and English there are no differences based on *L1*, which is only partly in line with the first hypothesis (only for Dutch). The data on lexical sophistication shows that most words that are used in all three languages are high frequent, between 60-67%. The differences between the languages are small. The proportion of errors shows that LB make more errors in Frisian than EB whilst for English it is the other way around. The second hypothesis, concerning that there would be no gender differences, is partly met. Boys have a higher lexical diversity than girls for English. The third hypothesis expected an increase in lexical diversity over time but this was not met. For all languages measurement 2 showed the highest lexical diversity and in measurement 3 lexical diversity was back at approximately the level of measurement 1. This is the case for both participant groups and all three languages.

The data on lexical richness shows differences between EB and LB. This is most noticeable in LB having a lower lexical diversity without transfer and prompts, compared to EB. For English, EB have a lower lexical diversity without transfer and prompts, compared to LB. The effect sizes are very large and medium respectively. The proportion of errors also shows this trend as LB have more errors in Frisian and EB have more errors in English. For Dutch no differences were found. Comparing the three languages to each other on lexical richness, also shows differences. The average VOCD in Dutch is higher than in Frisian and English, especially when transfer and prompts are excluded. Furthermore, in English, more high-frequent words are used than in Frisian and Dutch. Finally, the results on the proportion of errors show that EB make most errors in English whilst LB make a similar number of errors in Frisian and English.

5.6 Discussion

In this chapter, first of all self-assessment of language proficiency by the participants was studied. Differences were found between the ratings for self-assessment of language proficiency between EB and LB. In line with expectations, EB rate their Frisian language skills higher than LB. Contrary to expectations LB rate two of the four Dutch language skills higher than EB and LB also rate two of their English language skills higher than EB. EB furthermore rate their Dutch speaking and listening skills slightly higher than their Frisian speaking and listening skills and their Dutch reading and writing skills considerably higher than their Frisian and Eng-

lish reading and writing skills. This was also the result Popma and Arocena Egaña (2013) found in their study in which Frisian secondary school pupils participated. Unlike Popma and Arocena Egaña (2013)'s results, EB do rate their Frisian language skills higher than their English skills. LB however, rate their English language skills higher than their Frisian language skills. There are also gender differences for self-assessment of language proficiency. Girls rate their Frisian language skills higher than boys who in turn rate their English language skills higher than girls.

Secondly, the EFL vocabulary test was discussed. There are no differences between EB and LB and so *L1* is no significant predictor but *Time* and *Gender* are. With time LB gradually increase in vocabulary scores whereas EB first show a decline in scores after which they scored near as high as LB. *Gender* differences show that boys score higher than girls.

Finally, the actual oral proficiency in Frisian, Dutch and English was studied by looking at fluency, lexical fluency strategies and lexical richness. Based on the claim that L3 development might be easier for bilinguals than for monolinguals (for a review see Cenoz, 2003a) and the claim that positive transfer is enhanced in typologically related languages (Cenoz, 2003a) the question is what this implies for bilinguals in the Frisian context. Like in earlier studies by Cenoz (1991, 1997) and Lasagabaster (1997) in the present study a distinction was made between EB and LB. The difference compared to earlier studies was that in the present study three very closely related languages were involved whereas in those studies very distinct languages (Basque, Spanish and English) were involved. Also, in the present study participants were tested three times in one school year so development over time could be analysed whereas in the earlier studies only one measurement took place. The main question of the present study was what being bilingual in the province of Fryslân meant for the level of oral English proficiency and the development in it. In order to get a complete picture of participants' oral proficiency, their Frisian and Dutch oral proficiency was also tested. Cenoz (1991) and Lasagabaster (1997) found that early bilinguals had a higher English proficiency than later bilinguals but in a later study Cenoz (1997) found no differences between early and later bilinguals. Since the situation in the province of Fryslân is so different from the Basque Country with Frisian, Dutch and English being very closely related, it was interesting to study the English language development of EB and LB in the Frisian context.

The results obtained in the present study show a clear picture of the differences between EB and LB for Frisian and English. There are almost no differences for Dutch. The main differences between the two groups are on Frisian. LB show a lower oral proficiency on all three aspects: fluency, lexical fluency strategies and lexical richness. This can be explained by the fact that for LB Frisian truly is their second language and they are not as orally proficient in it as in Dutch. In fact, sometimes their oral proficiency in English is better than in Frisian. On some of the analysed measures such as the number of repetitions, transfers and neologisms, LB perform better in English than in Frisian. For English, LB are on the whole more orally proficient than EB. They use fewer lexical fluency strategies (transfer and lexical and grammatical errors) and have a higher lexical diversity. This is in contrast with the studies conducted in the Basque Country where advantages were found for early bilinguals (Cenoz, 1991; Lasagabaster, 1997) or no differences were found (Cenoz, 1997). Despite earlier theories and studies, in the Frisian context being a (young adolescent) bilingual is not an advantage in oral L3 English development. Being highly proficient in Frisian and Dutch does not automatically imply a better oral proficiency in English. Which is where the following question appears: what other factors besides L1 might influence the results? In chapter 4 on the language background and motivation and attitude towards language learning of the participants it was concluded that the participant groups not only differ on their language background (EB or LB) but consequently they also differ on the amount of language contact and language attitude and motivation. The fact that LB perform worse in Frisian and better in English can partly be explained by these findings. As far as Frisian is concerned, LB have more negative language attitudes and a lower motivation to learn Frisian and this becomes more negative during the school year in which they were tested. As far as English is concerned, LB have more exposure to it through their parents and they are more confident about their English language skills, compared to EB. LB boys also claimed to speak a lot of English during online computer games that they play. These are played with players from all over the world whom chat with each other in English. Again, this might affect their English oral speaking performance. EB on the other hand are generally from a lower socioeconomic background and are less exposed to English at home. Furthermore, they feel more confident about their Frisian language skills than their English language skills. All this influences the results on the picture story tasks in the three languages and provides a good explanation of the differences that were found. Table 22 provides an overview of the characteristics of EB and LB based on this chapter's results.

Table 22. Characteristics EB and LB on (oral) language proficiency (N=77).

		EB	LB
Self-assessment of language proficiency		more confident about Frisian language skills	more confident about Dutch and English language skills
EFL vocabulary test		no differences	no differences
Oral language proficiency	fluency	less disfluencies in Frisian	more repetitions, retracings, trailing offs and self-completions in Frisian
	lexical fluency strategies	make more use of transfer and lexical and grammatical errors in English	make more use of transfer, prompts, neologisms and grammatical errors in Frisian
	lexical richness	higher lexical diversity in Frisian	higher lexical diversity in English
Development over time		fluctuation in results for all instruments during the school year	overall, gradual improvement in results for all instruments

5.7 Conclusion

This chapter looked at oral language proficiency of EB and EB. First of all, self-assessment of language proficiency was studied showing that EB feel more confident about their Frisian language skills and LB feel more confident about their English language skills. Comparisons between EB and LB on the EFL vocabulary test showed no differences.

The results of the Frisian and Dutch picture story tasks, show that the hypothesised difference in Frisian and Dutch (oral) proficiency and the classification into EB and LB is justified. In other words, EB have indeed a higher degree of Frisian-Dutch bilingualism compared to LB. The two groups differ in Frisian but almost not in Dutch oral proficiency. As was to be expected, in the Frisian picture story task LB use a lower average number of words for the task, have more disfluencies, make more use of lexical fluency strategies (transfer, prompts, neologisms and grammatical errors) and have a much lower lexical diversity compared to EB. In Dutch, the differences between the two groups are just minor and only show in LB having slightly more disfluencies (filled pauses and trailing offs) than EB. An explanation for this could be that for LB the Dutch picture story task is their first picture story task while for EB it is their second since they have already done the task in Frisian.

The results of the English picture story task also show differences between EB and LB. EB make more use of lexical fluency strategies (transfer and lexical and grammatical errors) and have a lower lexical diversity compared to LB. Comparing

participants' Frisian, Dutch and English oral proficiency of the participants to each other showed the following. As far as fluency is concerned, participants show most disfluencies in English. The only exception is the number of repetitions in Frisian exceeding the number of repetitions in English for LB. Lexical fluency strategies are also mostly used in English. Again, with two exceptions, namely the use of Dutch transfers and neologisms by LB in Frisian as was to be expected due to their low(er) level of Frisian oral fluency compared to EB. Lexical diversity (transfer and prompts excluded) is lowest for English for EB and middle lowest for LB, who have a slightly lower lexical diversity in Frisian. Overall, English is the language the participants are least orally proficient in. However, LB also show a much lower oral proficiency in Frisian compared to EB. Both groups show the highest oral proficiency in Dutch where they have almost no disfluencies, make almost no use of lexical fluency strategies and have the highest lexical diversity.

The effect of the development over time turned out important as it was significant on many points. Interestingly, the development fluctuates during the school year. The participants do not necessarily get much more proficient during the school year. Their average number of words goes up from measurement to measurement for the three languages and the number of repetitions and transfer goes down during the school year. However, the number of prompts in Frisian and English grows. The number of neologisms goes down from measurement 1 to 2 but up again in measurement 3. The number of lexical and grammatical errors also fluctuates. From the first to the second measurement the number of errors decreases but in the third measurement it increases again for EB and stays stable for LB. Lexical diversity is the highest in measurement 2 and the lowest in measurement 3. On the whole, scores are highest in measurement 2. It has the highest number of disfluencies but the lowest number of lexical fluency strategies and the highest lexical diversity. In measurement 2 the third group of participants is added and this might have influenced the results. The so-called acquaintance effect might have played a role here, implying that results get better over time as participants know what is expected of them. Measurement 3 is characterised by a dip in the results. This could have several explanations. On the one hand the difficulty of the picture story task might have had an influence, which increased from measurement to measurement. On the other hand, participants might have been less motivated to participate since it was the second or third time they conducted the different tests. Finally, the participants were at the end of the school year, which also might have decreased their motivation to participate.

All in all, it can be concluded from this chapter that EB in the Frisian context do not have a better (oral) English proficiency than LB when keeping all other influencing factors constant. In fact, they are less proficient than LB when looking at their actual oral language proficiency. However, the development over time is of important influence for EB, more than for LB. For example, EBs self-assessment of English language skills (especially reading and writing) knows a substantial positive growth during the school year and the use of repetitions and transfers in English decreases substantially compared to LB. Still, the findings are in general contrast with what earlier studies have found (Cenoz, 1991; Lasagabaster, 1997). Hence, these studies involved different languages that were more distant from each other. Still, the Frisian situation turns out to be different in many respects such as the big amount of English language exposure, especially for LB. Also, attitudes are different, EB do not see English as a threat for Frisian but still, they do not believe it is as important to speak English and they are less confident about their English language proficiency compared to their LB peers. In the Frisian context, a higher degree of bilingualism does not result in better oral English proficiency. The obtained results also give rise to new questions. Could a higher degree of bilingualism in Frisian and Dutch influence the speed of lexical access in English? This is what the third focus point of the dissertation in the next chapter deals with.

Chapter 6 - Lexical access

6.1 Introduction

As mentioned in section 2.5, a much-debated issue in research on multilingual lexical access and selection is whether the different languages of the multilingual individual are activated at the same time. Factors that influence the activation of the different languages are for example language proficiency and language contact (Cenoz, 2003b; de Bot, 2004). Both play a role for the participants involved in this dissertation. Results in chapter 5 have shown that there is indeed a difference in degree of bilingualism between EB and LB. EB are more proficient in Frisian than LB and both groups are equally proficient in Dutch. Next to the difference in degree of bilingualism between EB and LB there is a difference in language contact, as the results presented in chapter 4 have shown. EB are more exposed to Frisian at home and LB are more exposed to English at home. There are some differences in language exposure at school. LB are more exposed to English than their EB peers in measurements 1 and 2. These results give rise to the question if and how this influences the lexical processing of the participants in the different languages which is what this chapter deals with. In this dissertation, lexical processing is measured in terms of the speed of lexical access: the time it takes to access words in the mental lexicon.

The focus point lexical access deals with the question whether EB and LB differ on a) the accuracy in lexical access, b) the speed of lexical access in word recognition in Frisian, Dutch and English and includes the influence of the development over time.

This chapter discusses whether being an EB or LB influences accuracy and speed of lexical access in Frisian, Dutch and English. It studies the lexical access in word recognition in Frisian, Dutch and English through two reaction time experiments, testing the hypotheses of the Bilingual Interactive Activation Plus model (BIA+) by Dijkstra and van Heuven (2002). The possible implications of the dissertation's results on this model are discussed, especially in the light of dealing with different degrees of bilingualism (EB or LB) and the influence of the developing L3.

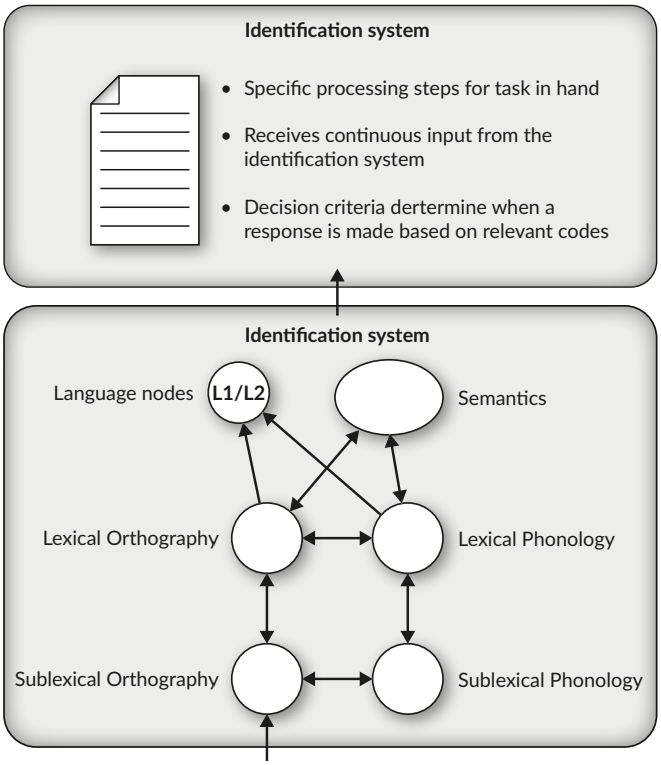
6.2 Theoretical background

6.2.1 Bilingual Interactive Activation Plus model

Section 2.5, briefly presented the BIA+ model (Dijkstra & van Heuven, 2002), shown in figure 1. The BIA+ model's main claim is that the lexicon is integrated and shared across languages and lexical access is parallel and non-selective. It assumes that bilingual word recognition is affected by cross-linguistic orthographic similarities

and phonological and semantic overlap (Dijkstra & van Heuven, 2002). The model claims that it is not language membership that triggers word activation but the match between the input word and internal lexical representations. This match is influenced by typological distance (for example degree of cognates) and level of proficiency in the languages.

Figure 1. The *Bilingual Interactive Activation Plus model (BIA+)* by Dijkstra and van Heuven *(2002)*.



In the BIA+ model relevant words from all languages are activated on a visually presented word and these compete for selection when they share the same orthography, phonology and semantics. The activation is higher when the overlap between the input word and mental lexicon representation is larger (Dijkstra & van Heuven, 2002) which is where cognateness plays an important role. Several studies have shown that cognates are responded to faster than non-cognates and more so, triple cognates are responded to faster than double cognates (e.g. Lemhöfer, Dijkstra & Michel, 2004; Hoshino & Kroll, 2008; Szubko-Sitarek, 2011). Furthermore, a study on Dutch-English-French trilinguals by van Hell and Dijkstra (2002) showed

that even when the orthography and phonology are not completely identical, cognates are responded to faster than non-cognates. In multilinguals of related languages, as in the current study, words should be recognised rather rapidly due to the orthographic similarities and phonological and semantic overlap of the three languages. However, as Dijkstra (2003) points out:

> With the addition of each new lexicon, the number of words in the lexicon increases. What happens to the word recognition performance of the model if the size of its lexicon increases? With a larger density of words, the competition between words (lateral inhibition) becomes stronger, and the moment in time that that presented word can be identified is delayed. Note that this is the case irrespective of whether the newly acquired words are from the same language or from another language. (...) In both cases, there are on average more words that are similar to an input string, making the recognition of this string more difficult. (p. 18)

So, as the lexicon grows, activation of words might become higher for related words but competition between words grows. For example, in a Frisian L1-Dutch L2 EB, cognate words such as Frisian *dún* and Dutch *duin* (*dune* in English) would compete during word recognition because of a similar activation level. In a Dutch L1-Frisian L2 LB Dutch *duin* would receive the highest activation and therefore be the dominant word candidate. In line with this, is the finding by van Hell and Dijkstra (2002, p. 787) that "a certain level of weaker language fluency is required before any weaker language effects become noticeable in L1 processing". They compared trilinguals with different and similar levels of proficiency in L2 and L3 and found that equal levels of proficiency in L2 and L3 resulted in faster reaction times on L1 Dutch words that were cognates with L3 French words compared to non-cognates whereas a lower level of proficiency in L3 showed no such differences.

What the BIA+ model does not take into account is the development of the different languages. Although a proposal has been made by Grainger, Midgley and Holcomb (2010) for the developmental BIA+, the BIA-d, this was meant for late learners of an L2. Furthermore, the BIA+ model only takes into account two languages whereas in the current study three languages are involved. Despite these possible limitations, BIA+'s claims are challenging enough to be used in this dissertation to see whether its claims also hold for EB of related languages acquiring a third related language.

6.2.2 Lexical Decision Task and Word Naming Task

The most popular two tasks to test bilingual visual word processing models, such as the BIA+ model, are two reaction time experiments: the Lexical Decision Task (LDT) and the Word Naming Task (WNT). In the LDT participants have to indicate whether the letter string they see on the computer screen is an existing word or not by pressing a 'yes' or a 'no' button as fast as possible. In the WNT participants have to name the word that appears on the screen as fast as possible. In both experiments reaction times (RTs) are registered. Although both tasks involve visual word recognition, they are thought to require different processing operations (de Groot, Borgwaldt, Bos & van den Eijnden, 2002). De Groot (2011, p. 157) claims that the LDT nor the WNT "provides a pure measure of lexical access". According to de Groot both tasks involve task-specific processes that have exclusively to do with word recognition. For example, de Groot et al. (2002) mention that the LDT is, besides a word-identification task, also a discrimination task since words and pseudo-words have to be discriminated from one another. The WNT not only requires recognition of the word but also pronouncing it. De Groot et al. (2002, p. 95) claim that "either the recognition stage of processing or the production stage, or both of them, may be the locus of a particular effect". Furthermore, naming can be influenced by a language's orthographic depth. In more shallow languages, like Dutch, correspondence between graphemes and phonemes is relatively consistent making it easier to pronounce the word without tapping into the semantic component (de Groot et al., 2002). In orthographically deep languages, like English and Frisian, the relation between graphemes and phonemes is not so clear, making it harder to pronounce the word and therefore participants possibly have to access the semantic component before being able to pronounce the word. Grainger and Jacobs (1996) agreed that both the LDT and WNT tap into word recognition but also into individual components. They developed the Venn diagram, illustrating that both tasks share a 'functional overlap' representing word recognition (they actually included a third task, perceptual identification which is not discussed here).

By having participants perform both tasks in this dissertation, a distinction can be made between similar obtained effects - assuming that these tap into the common word-recognition component of both tasks - and different effects - those that tap into each tasks' unique components (de Groot et al., 2002) like the semantic component for the LDT and the phonological component for the WNT.

6.2.3 Masked priming studies

As mentioned briefly in section 3.3.5, often the LDT and WNT are used with a semantic priming technique. Both tasks consist of primes and targets that can have different relationships to each other (semantically related, unrelated or neutral) and the effect of this relationship is studied. The semantic priming effect is the effect that related prime-target pairs are responded to faster than unrelated or neutral prime-target pairs (de Groot, 2011). For example, as mentioned in the previous section, earlier research has shown that cognates are generally responded to faster than non-cognates. The tasks can be monolingual or bilingual. The prime activates the mental lexicon and participants respond to the target. In these tasks, the prime is shown so short that it cannot be consciously registered by the participant. The prime activates possible word candidates that might or might not facilitate the speed of recognition of the target. According to de Groot (2011):

> The very moment the prime gains access to its (distributed) meaning representation in conceptual memory, the meaning of the target is also partially activated, causing the target to be processed relatively quickly when it is subsequently presented. (p. 140)

As de Groot (2011) points out, the prime does not have to be consciously perceived for the spreading activation process to take place. To prevent conscious recognition of the prime, it can be preceded by a mask consisting of a few hash tags. The masked priming procedure in reaction time experiments was first used by Segui and Grainger (1990). Other studies followed which showed that the level of proficiency in the different languages of the participant plays a role in priming (e.g. Bijeljac-Babic, Biardeau & Grainger, 1997; Duñabeitia, Perea & Carreiras, 2010). A study by Bijeljac-Babic, Biardeau and Grainger (1997) that involved a LDT priming task, with L1 French and L2 English, showed that whether or not word candidates from the non-target language were activated depended on the proficiency level in the languages involved. In Bijeljac-Babic et al.'s study proficient French-English bilinguals were slower responding to between language items (English prime - French target) than beginning bilinguals (L2 English learners with L1 French). For the proficient bilinguals, the English prime inhibited their response to the French target because of activation of both languages, whereas the beginning bilinguals' activation of French was much stronger than the English activation. Duñabeitia, Perea and Carreiras (2010) also concluded that highly fluent Basque-Spanish bilinguals show a translation priming effect. They used cognate and non-cognate translation equivalents in a masked priming LDT. A significant priming effect was found for both categories, with a greater effect for cognates.

The BIA+ model also makes predictions about a possible priming effect. It predicts that EB will show a symmetrical translation priming effect in which similar RTs are expected from L1 to L2 (forward priming) and L2 to L1 (backward priming) because of the frequent use of both languages. LB on the other hand are hypothesised to show asymmetrical priming effects in which forward priming (L1 to L2) is expected to be faster than backward priming (L2 to L1). Duñabeitia and colleagues (2010) conducted their experiment in two directions: from L1 to L2 (forward) and from L2 to L1 (backward). They found a symmetrical priming effect for EB, implying that the magnitude of the priming effect was equally strong for both directions.

6.2.4 Development over time

As was discussed in chapter 2 (section 2.6) and chapter 5 (section 5.2.4) language development was viewed as dynamic in this dissertation. Not only for actual language proficiency in terms of for example vocabulary or disfluencies but also for the underlying processes. Development over time is not integrated in the BIA+. Although a proposal has been made by Grainger, Midgley and Holcomb (2010) for the developmental BIA+, the BIA-d, this was meant for late learners of an L2. By adding it here, some insight is gained in how speed of lexical access develops over time, for example in increasing language proficiency.

6.3 Hypotheses

What the earlier mentioned studies have in common is that they looked at groups of bilinguals of languages that were either from different language families (e.g. Germanic/Romance) or had more language distance than the languages involved in the current study (e.g. Dutch, English and German). Furthermore, although these studies almost all took differences between EB and LB into account, they did not take into account the development of the languages involved as they only measured at one time point. Finally, all studies had participant groups that were university students, who were expected to be at least completely fluent in their L1 and had different levels of proficiency in their L2, L3, etc. The current study is different from the previous studies firstly because it involves closely related languages from the same language family. Secondly, it looks at the development of these languages over time, by measuring at three time points in one school year. Thirdly, a much younger group of participants was chosen, namely first year secondary school pupils (mean age 12.5), at different stages of proficiency in their three languages. Finally, the current study involves two experiments, namely a Lexical Decision Task and a Word Naming Task, whereas most other studies only used the Lexical Decision Task.

This chapter looks at whether degree of bilingualism has an impact on the accuracy and speed of lexical access in a third language when the three languages involved are closely related. It also looks at how the speed of lexical access develops over time with increasing L3 proficiency. Based on the BIA+ model, it was assumed that all three languages would be activated - be it to different degrees - during both tasks for both groups. In line with the BIA+ model it was hypothesised that language access would be non-selective in both tasks. The experiments always included two of the three languages (as explained in section 3.3.5). Even so, it was expected that non-target language knowledge would be activated even when this language was not needed for the task. That implied that when for example Dutch and English were involved in the experiment, Frisian words would also be activated. Furthermore, it was expected that the level of proficiency in the L1 and L2 could either cause facilitation of word candidates because related words in the languages had higher activation and therefore faster lexical access or inhibition of word candidates because of more competition of lexical candidates resulting in slower lexical access. Translating these expectations to the two participants groups, it was hypothesised that EB would experience facilitation and inhibition effects in both the LDT and WNT. They were expected to have higher accuracy scores for Frisian and English targets and similar accuracy scores for Dutch targets, compared to LB. Concerning RTs, they were expected to respond faster to cognates because of the overlap between the languages and slower responses to non-cognates because of more competition between word candidates compared to their LB peers who were expected to score more similar reaction times for both cognates and non-cognates. As discussed in the previous section, the semantic priming effect is generally symmetrical for EB whereas for LB the effect is generally stronger from L1 to L2 than from L2 to L1. In this case also L3 is involved. And so secondly, a symmetrical priming effect was expected for EB whereas LB were expected to show an asymmetrical priming effect in which forward priming would be faster than backward priming in both the LDT and WNT. A third expectation was that EB would show faster RTs over time (development from one measurement to the other), during the school year with increasing L3 proficiency, compared to their LB peers in both the LDT and WNT. This was expected because EB already established strong lexical links for their L1 Frisian and L2 Dutch and would therefore link the newly gained L3 lexical knowledge more easily to their existing lexical knowledge than LB. The fourth expectation concerned the differences between the LDT and WNT. It was expected that participants would respond faster to the WNT than the LDT and less differences between the different prime-target categories would be expected because in this task the semantic component was expected to be used less. First of all because

the WNT had 4 categories instead of the 5 that the LDT had (WNT did not include pseudo-words). Secondly because slightly different processes are involved between the LDT and WNT in which the WNT has more phonological components entailing faster processing compared to the LDT which taps more deeply into the semantic components taking longer to process.

To sum up, it was hypothesised that, compared to LB, EB would have:

a) higher accuracy scores for the LDT for Frisian and English targets;
b) faster RTs for cognates because of the orthographic similarities and phonological and semantic overlap of the three languages;
c) slower RTs for non-cognates because of more word candidates;
d) a symmetrical priming effect because of the frequent use of the first two languages;
e) faster development of RTs during the school year because of more language experience;

Furthermore, in line with de Groot et al. (2002) it was hypothesised that:

f) RTs for the WNT would be faster than for the LDT.

6.4 Method

6.4.1 Participants

The participants were 34 EB and 43 LB, as described in chapter 3, sections 3.1 and 3.2.

6.4.2 Materials and procedures

The materials and procedures are discussed in chapter 3, section 3.3.5.

6.4.3 Statistical analyses

In total, there were 200 LDT and 200 WNT collected for the L1-L3 language pairs and 195 LDT and 195 WNT for the L2-L3 language pairs. The data was all entered in SPSS. For the accuracy scores in LDT data a multilevel regression model was used with two fixed factors: *L1* (EB or LB) and *Time* (measurement 1, 2 and 3). All other data was analysed using a multilevel regression model with crossed random effects *subject* and *item* and fixed factors *L1*, *Time* and prime-target *Category*. *Category* meant the five (LDT) or four (WNT) different prime-target word pairs. In addition, the fixed factor *Gender* was added and wherever *Gender* turned out to be a significant predictor, it was kept in the model. Covariates such as the influence of language contact or oral language proficiency were included in the analyses of the LDT accuracy scores and kept in wherever they improved the model. In the analyses of the reaction times, covariates could not be included since it turned out impossible to run the model with these. Effect sizes were calculated using Cohen's d_s.

6.5 Results

6.5.1 Accuracy scores LDT

First of all, the accuracy scores for the LDT were calculated, shown in figure 2. Both EB and LB had the highest accuracy when they had to respond to a Dutch word. They made most errors when they had to decide whether a Frisian word was a real word or not. Whether the prime was Dutch or Frisian did not influence the accuracy score of the English targets.

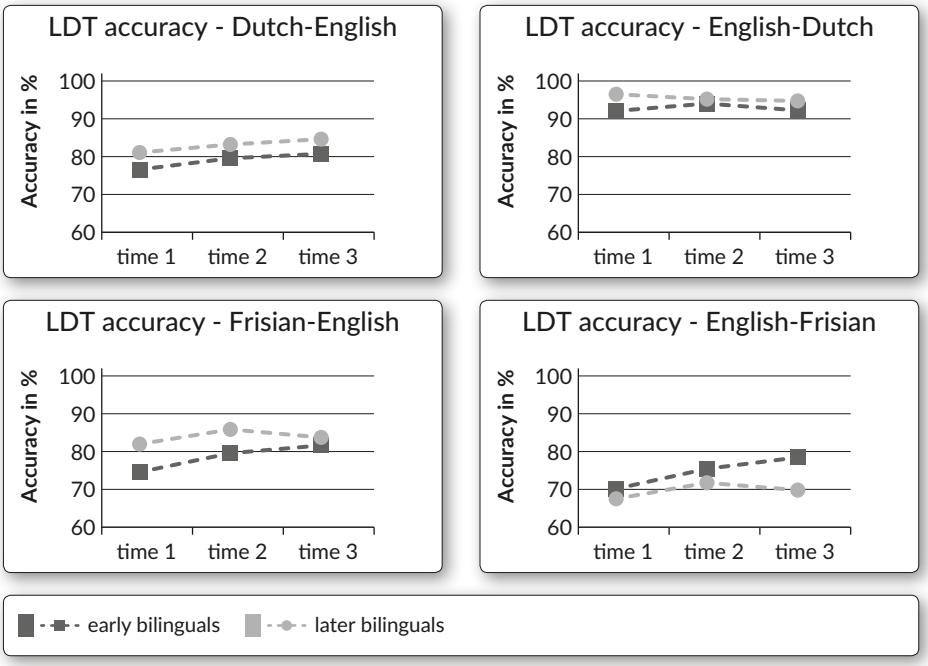


Figure 2. Accuracy percentages LDT per measurement and language pair.

Results were analysed using a multilevel regression model with fixed factors *L1* and *Time* and where it turned out to be a significant predictor *Gender* was also added as a fixed factor, which was only for the Frisian-English language pair. The results of the EFL vocabulary test was added as a covariate for the Dutch-English and Frisian-English language pairs as they turned out to have a significant influence on the accuracy scores.

Table 1. Multilevel regression model - LDT accuracy scores.

	Dutch-English		English-Dutch		Frisian-English		English-Frisian	
LDT accuracy scores	rc (υ)	*p*	rc (υ)	*p*	rc (υ)	*p*	rc (υ)	*p*
Intercept	169.60 (1041.40)	.000*	76.89 (22354.37)	.000*	179.85 (1400.88)	.000*	77.40 (4588.63)	.000*
L1	68.14 (6.59)	.011*	76.89 (2.58)	.113	67.41 (9.93)	.002*	77.40 (4.54)	.036*
Time	117.43 (4.57)	.012*	122.07 (1.09)	.340	112.61 (5.69)	.004*	122.78 (8.91)	.000*
L1 * Time	111.02 (1.47)	.235	122.07 (0.75)	.472	106.50 (3.19)	.045*	122.78 (4.08)	.019*
Gender	X	X	X	X	68.58 (4.27)	.043*	X	X
EFL vocabulary test	177.76 (50.40)	.000*	X	X	179.40 (36.17)	.000*	X	X

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The fixed factor *L1* was a significant predictor in all language pairs but the English-Dutch language pair. For this language pair EB and LB scored the same accuracy scores (93 against 95 items correct on average). For the Dutch-English language pair, the effect size between EB and LB, calculated using Cohen's d_s, was medium at *d* = -.55. EB had a significantly lower accuracy score over all three measurements compared to LB. The average difference over the three measurements was 3.5 items. For the Frisian-English language the effect size between EB and LB was small at *d* = -.44 implying that EB had a lower accuracy score than LB. The average difference over the three measurements was 4.3 items. Finally, for the English-Frisian language pair the effect size was medium at *d* = .74. EB had a higher accuracy score compared to LB with an average difference over the three measurements of 4.5 items.

The fixed factor *Time* was significant for all language pairs, except the English-Dutch language pair. For this language pair both EB and LB scored high during all measurements. For the Dutch-English language the effect sizes were all small: *d* = -.10 for time 1 to 2, *d* = .15 for time 2 to 3 at and *d* = .04 for time 1 to 3. From time 1 to 2 the accuracy scores gradually grew (80 and 83 correct items respectively) but went down again for time 3 (81 items correct). The effect sizes for *Time* for the Frisian-English language were all small: *d* = -.08 for time 1 to 2, *d* = .27 for time 2 to 3 and *d* = .19 for time 1 to 3. The accuracy scores over time showed the same tendency as the Dutch-English language pair, scoring best at time 2 (83 items correct), compared to time 1 (79 items correct) and time 3 (81,5 items correct). The effect

sizes the English-Frisian language pair were small *d* = -.31 for time 1 to 2 at, *d* = .14 for time 2 to 3 and *d* = -.17 for time 1 to 3. EB had the biggest development in accuracy scores from time to time with three to four items more correct whereas LB first showed a growth of four more correct items from time 1 to 2 but from time 2 to 3 they got one and a half item less correct.

The fixed factor *Gender* was only significant for the Frisian-English language pair and had a small effect size of *d* = .32. Boys on average had 3 correct items more than girls (82.9 against 80.1 correct items).

Finally, the covariate EFL vocabulary test had an influence on the number of correct items. for the Dutch-English and Frisian-English language pairs. Effect sizes were small at *d* = .04 for both language pairs implying that although significant, the magnitude of the effect was very small.

To conclude, for the Dutch-English, Frisian-English and English-Frisian language pairs both *L1* and *Time* influenced the accuracy scores. For the English-Dutch both predictors were of no influence. EB were more accurate in English-Frisian items, LB were more accurate in Dutch-English and Frisian-English items. *Gender* only played a role in the Frisian-English language pairs, where boys scored higher accuracy scores than girls. The influence of *Time* was significant but small with only a couple of items more or less correct per measurement. Results showed that the best measurement for the Dutch-English and Frisian-English language pairs was time 2 in which both participant groups scored the highest accuracy scores. The same applies for LB for the English-Frisian language pair whereas EB showed a gradual growth in accuracy scores for this language pair. In the case of the English target, LB scored higher accuracy scores. For the Frisian targets, EB had higher accuracy scores.

6.5.2 RT results Lexical Decision Task

6.5.2.1 Mean reaction times Lexical Decision Task

The average RTs for the LDT are shown in figure 3 per language pair for the different groups and measurements. What immediately stands out is that there are only minor differences between EB and LB for the Dutch-English and English-Dutch language pairs. LB overall had slightly slower RTs for these language pairs, compared to EB. There are however major differences between EB and LB for the Frisian-English and English-Frisian language pairs. Surprisingly, the results show that EB had slower RTs than LB for these language pairs. What furthermore is notable is that the RTs were rather long between 800ms and 1450ms, compared to RTs between 400ms and 800ms that are usually found in LDTs (Kerkman, 1984). Only a few studies involving lexical access included a young age group (e.g. Woutersen, Cox, Weltens & de Bot, 1994) and closely related languages or dialects (e.g. Woutersen et al., 1994;

Melinger, 2018) but these also did not find such long RTs as in the current study. However, Woutersen et al. (1994) used an auditory LDT and Melinger (2018) used picture naming which make comparisons difficult. Therefore, reasons for the long RTs found can only be hypothesised. One factor that might influence the RTs is the participants' relatively young age. Earlier studies have mostly focused on an older age group with hence, more experience in word recognition. A second factor might be the three closely related languages that are involved. This close relationship might make the task more difficult in the sense that it can be confusing to decide whether a word is a real word or not as they might be so alike between the different languages. In other studies languages with more language distance were used.

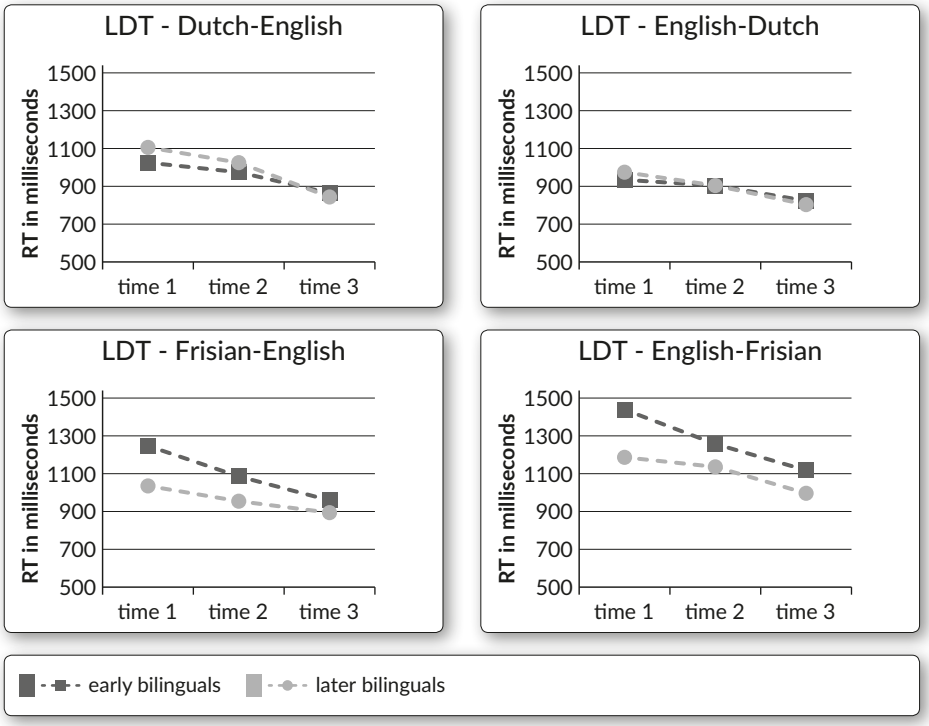


Figure 3. Mean RTs LDT per measurement and language pair.

Results were analysed using a multilevel regression model with crossed random effects *subject* and *item* and fixed factors *L1*, *Time* and prime-target *Category*, which had 5 categories (see table 15, chapter 3, section 3.3.5). *Gender* was left out of the model since the analysis showed they did not influence the RTs. Since the model was already multi-layered, it proved impossible to run the model including covariates such as language motivation and contact, these were left out of the model.

Table 2. Multilevel regression model - LDT reaction times.

	Dutch-English		English-Dutch		Frisian-English		English-Frisian	
LDT reaction times	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	115.75 (2097.96)	.000*	121.39 (2819.86)	.000*	122.59 (2038.02)	.000*	116.15 (1762.23)	.000*
L1	79.51 (0.96)	.330	77.39 (0.04)	.839	77.65 (11.86)	.001*	77.47 (10.67)	.002*
Time	133.06 (30.40)	.000*	131.06 (21.15)	.000*	133.06 (28.20)	.000*	134.33 (27.13)	.000*
Category	312.36 (24.61)	.000*	323.78 (38.41)	.000*	321.39 (19.09)	.000*	351.73 (6.12)	.000*
L1 * Time	133.06 (1.50)	.226	131.04 (0.79)	.456	133.05 (3.30)	.040*	134.32 (2.28)	.107
L1 * Category	340.71 (9.53)	.000*	335.45 (2.22)	.066	358.04 (3.43)	.009*	342.74 (5.68)	.000*
Time * Category	3366.08 (4.59)	.000*	4278.62 (7.96)	.000*	4020.83 (6.21)	.000*	2745.57 (0.70)	.691
L1 * Time * Category	3366.99 (2.23)	.023*	4266.11 (3.42)	.001*	4023.27 (0.71)	.684	2744.83 (1.73)	.088

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The fixed factor *L1* was significant for the Frisian-English and English-Frisian language pairs. For the Frisian-English language pair EB had slower RTs than LB for time 1 and 2. The effect size between EB and LB, calculated using Cohen's d_s, was small at d = .29. EB were on average 137ms slower than LB. For the English-Frisian language pair EB had slower RTs than LB for time 1 and 3. The effect size between EB and LB was small at d = .39. EB were 164ms slower on average over the three measurements. These results revealed that *L1* was only a significant predictor for the Frisian-English and English-Frisian language pairs but in a different direction than expected: EB had slower RTs than LB.

Table 2 shows two-way and three-way interactions between the three main factors *L1*, *Category* and *Time*. There were three two-way interactions: *L1*Time*, *L1*Category* and *Time*Category* and one three-way interaction: *L1*Time*Category*. Whenever these interactions turned out to be significant it said something about the interaction between the different variables. For example, if *L1*Time* was significant, as in the Frisian-English language pair, this implied that the influence of L1 consistently influenced RTs over all three measurements. Or when *Time*Category* was significant, like in all but the English-Frisian language pair, RTs on the different categories became faster over time.

6.5.2.2 Development over time

The second fixed factor that was calculated was *Time*, which was significant for all four language pairs. For the Dutch-English language pair *Time* was significant from time 1 to 3 and 2 to 3. The effect sizes were small at d = .36 for time 1 to 2, medium at d = .72 for time 2 to 3 and large at d = 1.09 for time 1 to 3. The participants got 70ms faster from time 1 to 2, 147ms faster from time 2 to 3 and 217ms faster from time 1 to 3. For the English-Dutch language pair *Time* was significant from time 1 to 3 and 2 to 3. The effect sizes were small at d = .47 for both time 1 to 2 and time 2 to 3 and large at d = .94 for time 1 to 3. The participants got 46ms faster from time 1 to 2, 96ms faster from time 2 to 3 and 142ms faster from time 1 to 3. For the Frisian-English language pair *Time* was significant from measurement to measurement for EB and for LB only from time 1 to 3. The effect sizes were small at d = .34 for time 1 to 2, small at d = .23 for time 2 to 3 and medium at d = .57 for time 1 to 3. The participants got 115ms faster from time 1 to 2, 97ms faster from time 2 to 3 and 211ms faster from time 1 to 3. Finally, for the English-Frisian language pair *Time* was significant from measurement to measurement for EB and for LB from time 1 to 3 and 2 to 3. The effect sizes were small at d = .24 for both time 1 to 2 and time 2 to 3 and small at d = .48 for time 1 to 3. The participants got 117ms faster from time 1 to 2, 138ms faster from time 2 to 3 and 255ms faster from time 1 to 3. What can be concluded from this is that there is a development in RTs; participants responded faster as the school year progressed for all four language pairs. The differences between EB and LB also changed during the school year. The initial differences mostly disappeared as the year progresses.

6.5.2.3 Reaction times five categories Lexical Decision Task

The third and final fixed factor that was calculated was *Category*. Figure 4 shows the five different prime-target categories per language pair (see table 15, section 3.3.5 for an overview) as an averaged score for all three measurements and divided by EB and LB. The table shows that both EB and LB generally responded slowest to pseudo-words for all four language pairs. Cognate 3 and non-cognate items were responded to fastest by both EB and LB.

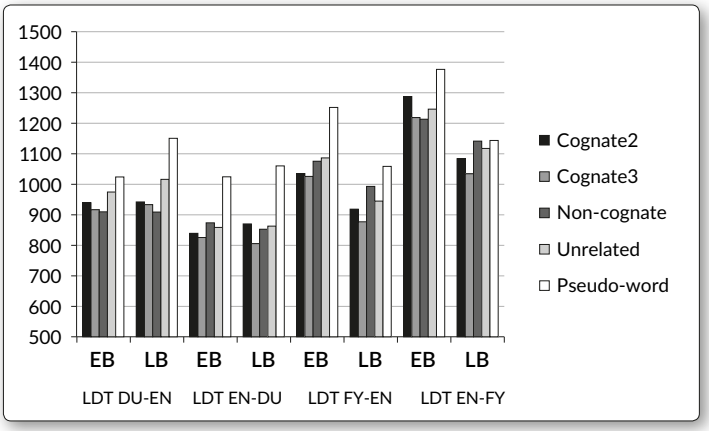


Figure 4. Mean RTs LDT per category prime-target relationship over 3 measurements.

Category was significant for all four language pairs. For the Dutch-English language pair *Category* was significant for the pseudo-words in time 1 and 2 but not in time 3. The effect sizes for *Category* were calculated by looking at the means over the three measurements of cognate2, cognate3, non-cognate and unrelated in comparison to pseudo-words. The effect sizes were: small at d = -.42 for cognate2, small at d = -.44 for cognate3, medium at d = -.55 for non-cognate and small at d = -.18 for unrelated. Compared to pseudo-words, cognate2 items were responded to 147ms faster, cognate3 items were responded to 162ms faster, non-cognates were responded to 178ms faster and unrelated items were responded to 92ms faster. For the English-Dutch language pair *Category* was significant for the pseudo-words in time 1 but not in time 2 and 3. The effect sizes were small at d = -.45 for cognate2, medium at d = -.64 for cognate3, small at d = -.46 for non-cognate and small at d = -.42 for unrelated. Compared to pseudo-words, cognate2 items were responded to 188ms faster, cognate3 items were responded to 227ms faster, non-cognates were responded to 179ms faster and unrelated items were responded to 182ms faster. *Category* was significant for all five word pairs in time 1, for all five word pairs except non-cognates in time 2 and for pseudo-words only in time 3. The effect sizes were all small at d = -.30 for cognate2, d = -.43 for cognate3, d = -.05 for non-cognate and at d = -.24 for unrelated. Compared to pseudo-words, cognate2 items were responded to 178ms faster, cognate3 items were responded to 204ms faster, non-cognates were responded to 121ms faster and unrelated items were responded to 140ms faster. Finally, *Category* was significant for all word pairs except non-cognates in time 1, for pseudo-words in time 2 and for cognate2 and pseudo-words in time 3. The effect sizes were all small at d = -.19 for cognate2, d = -.27 for cognate3,

d = -.07 for non-cognate and *d* = -.12 for unrelated. Compared to pseudo-words, cognate2 items were responded to 74ms faster, cognate3 items were responded to 134ms faster, non-cognates were responded to 83ms faster and unrelated items were responded to 78ms faster.

In conclusion, for the Dutch-English and English-Dutch language pairs only the pseudo-words' RTs significantly differed from the other prime-target word pairs: they were responded to slowest by both groups. For the Frisian-English and English-Frisian language pairs RTs for all prime-target word pairs differed significantly. The effect sizes showed that differences were biggest between the first four categories and pseudo-words for the Dutch-English, English-Dutch and Frisian-English language pairs. The differences between the five different categories were smaller for the English-Frisian language pair. In other words, for this language pair the prime-target relationship did not influence the RTs of the participants.

6.5.2.4 Symmetrical priming effect

Since one of BIA+ model's hypothesis was that a symmetrical priming effect was expected for EB, it was studied whether EB had equal RTs for forward (L1 to L3 / L2 to L3) and backward (L3 to L1 / L3 to L2) priming in the different language pairs. Overall, both EB and LB had the fastest RT when they had to respond to Dutch targets, which was EB's L2 and LB's L1. Both groups had the slowest RT when they had to respond to Frisian targets, which was EB's L1 and LB's L2. The RTs for the L3 English targets were faster when the prime was in Dutch (L2 EB / L1 LB) compared to when the prime was in Frisian (L1 EB / L2 LB). From this it can be concluded that EB had no symmetrical translation priming effect. Whenever EB's L1 Frisian was involved they had slower RTs than when their L2 Dutch was involved. For both groups, similar results were found: backward priming in the English-Dutch language pair was faster than forward priming in the Dutch-English language pair. Forward priming in the Frisian-English language pair was faster than backward priming in the English-Frisian language pair.

6.5.2.5 Main conclusions Lexical Decision Task

Looking at the above results the following conclusions can be drawn. For the Dutch-English and English-Dutch language pairs *Time* and *Category* are more important predictors on the RTs than *L1*. For the Frisian-English and English-Frisian language pairs all three predictors *L1*, *Category* and *Time* influenced the RTs.

6.5.3 RT results Word Naming Task

6.5.3.1 Mean reaction times Word Naming Task

Figure 5 shows the average reaction times for the WNT per language pair for the different groups and measurements. As can be seen there are only major differences between EB and LB for the English-Frisian language pair. What is furthermore clear is that there is a similar trend as in the LDT: LB have slower RTs when their L1 Dutch is involved (Dutch-English and English-Dutch language pairs) and EB have slower RTs when their L1 Frisian is involved when this is the prime (Frisian-English language pair) in time 1 but not in time 2 and 3. But when Frisian is the (English-Frisian language pair) EB have faster RTs than LB. What is furthermore apparent, is that the RTs are overall slow for word naming, between 600ms and 925ms. Although this is not uncommon (e.g. Hoshino & Kroll, 2008 found even longer RTs), it can only be hypothesised that some unexpected factors played a role, such as the young age of the participants and the close relationship between the different languages as mentioned in section 6.5.2. In the case of the Frisian target, which was responded to slowest, the low literacy skills in Frisian might also add to the length of the RTs.

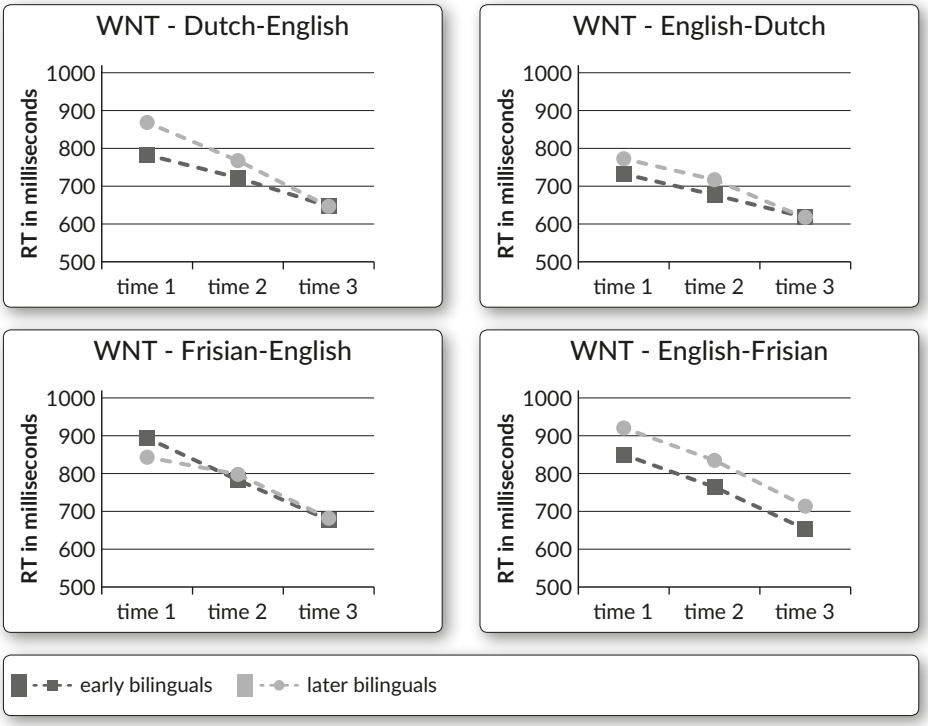


Figure 5. Mean RTs WNT per measurement and language pair.

Just as for the LDT, the WNT results were analysed using a multilevel regression model with crossed random effects *subject* and *item* and fixed factors *L1*, *Time* and prime-target *Category*, which had 4 categories (see table 15, chapter 3, section 3.3.5). Like with the LDT, *Gender* did not influence the RTs and was left out of the model. Also, it again proved impossible to run the model including covariates such as language motivation and contact and therefore these were left out of the model.

Table 3. Multilevel regression model - WNT reaction times.

	Dutch-English		English-Dutch		Frisian-English		English-Frisian	
WNT reaction times	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*	r_c (υ)	*p*
Intercept	121.50 (3389.57)	.000*	101.08 (4472.16)	.000*	120.08 (3455.88)	.000*	120.40 (3289.32)	.000*
L1	76.12 (4.47)	.038*	76.36 (1.78)	.186	75.26 (0.24)	.626	75.58 (9.52)	.003*
Time	126.51 (135.76)	.000*	126.16 (82.07)	.000*	125.47 (89.31)	.000*	123.40 (95.12)	.000*
Category	441.64 (29.78)	.000*	317.13 (25.85)	.000*	349.81 (7.91)	.000*	383.71 (11.12)	.000*
L1 * time	126.50 (8.16)	.000*	126.16 (2.64)	.075	125.47 (2.48)	.088	123.39 (0.10)	.906
L1 * category	276.15 (1.06)	.367	231.90 (0.85)	.467	222.10 (2.38)	.070	235.53 (1.22)	.302
Time * category	3459.85 (1.43)	.201	3466.33 (1.60)	.144	3386.55 (0.54)	.775	3413.75 (1.53)	.164
L1 * time * category	3458.03 (0.51)	.805	3466.48 (1.37)	.222	3386.53 (0.79)	.577	3413.55 (0.90)	.496

r_c= numerator df, (υ) = denominator df, *p* = significance level, * = significant result

The first fixed factor that was calculated was *L1*. The results of the analysis are discussed per language pair which was significant for the Dutch-English and English-Frisian language pairs. For the Dutch-English language pair, EB had faster RTs than LB for time 1 but not for time 2 and 3. LB were on average 43ms slower than EB. The effect size between EB and LB was small at *d* = .00 actually implying that the significance had no magnitude. For the English-Frisian language pair showed EB had faster RTs than LB in time 1, 2 and 3. The effect size between EB and LB was small at *d* = .25. LB were on average 67ms slower than EB.

As in the LDT, the two-way interactions *L1*Time*, *L1*Category* and *Time*Category* and the three-way interaction *L1*Time*Category* were calculated. There was only one significant interaction, *L1*Time* for the Dutch-English language pair. As figure 5 shows, over time the differences between EB and LB disappear, hence, the influence of *L1* changes over time.

6.5.3.2 Development over time

Time was the second fixed factor that was calculated. *Time* was significant for all language pairs. For the Dutch-English language pair *Time* was significant from measurement to measurement for both groups. The effect sizes for *Time* were medium at d = .72 for time 1 to 2, large at d = .84 for time 2 to 3 and large at d = 1.56 for time 1 to 3. The participants got 78ms faster from time 1 to 2, 100ms faster from time 2 to 3 and 178ms faster from time 1 to 3. For the English-Dutch language pair *Time* was significant from measurement to measurement for both groups. The effect sizes were medium at d = .55 for time 1 to 2, medium at d = .68 for time 2 to 3 and large at d = 1.22 for time 1 to 3. The participants got 57ms faster from time 1 to 2, 80ms faster from time 2 to 3 and 137ms faster from time 1 to 3. For the Frisian-English language pair *Time* was significant from measurement to measurement for both groups. Effect sizes were small at d = .36 for time 1 to 2, medium at d = .71 for time 2 to 3 and large at d = 1.07 for time 1 to 3. The participants got 82ms faster from time 1 to 2, 110ms faster from time 2 to 3 and 192ms faster from time 1 to 3. Finally, for the English-Frisian language pair *Time* was significant over time for both groups. Effect sizes were medium at d = .55 for time 1 to 2, large at d = .85 for time 2 to 3 and large at d = 1.40 for time 1 to 3. The participants got 84ms faster from time 1 to 2, 119ms faster from time 2 to 3 and 202ms faster from time 1 to 3. These results show an overall development in RTs for naming; participants respond faster as the school year progresses.

6.5.3.3 Reaction times four categories Word Naming Task

The third fixed factor that was calculated was *Category*. Figure 6 shows the four different prime-target categories per language pair as an averaged score for all three measurements (see table 15, chapter 3, section 3.3.5 for an overview). As the figure shows, both EB and LB were generally fastest naming cognate3 words for all four language pairs. Non-cognates and unrelated words were named slowest by both EB and LB.

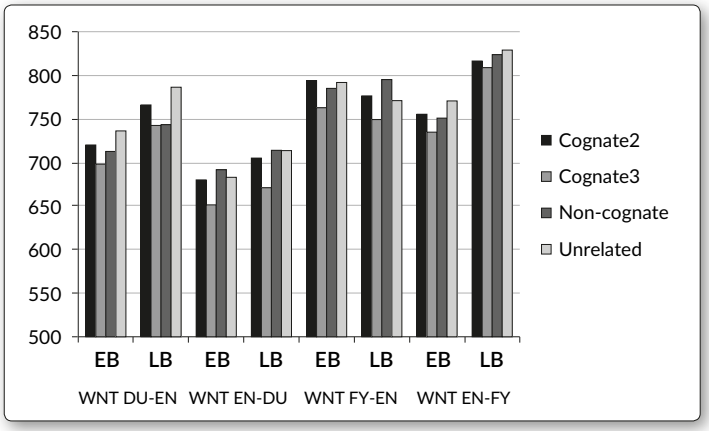


Figure 6. Mean RTs WNT per category prime-target relationship over 3 measurements.

Category was a significant predictor for all language pairs. The effect sizes for *Category* were calculated by taking the means over the three measurements of the different word pairs and performing in-between comparisons (cognate2-cognate3, cognate3-non-cognate and non-cognate-unrelated). For the Dutch-English language pair *Category* was significant for all word pairs for time 1, for non-cognates in time 2 and there were no significant differences between the two groups on category for time 3. Effect sizes were all small at d = .26 between cognate2 and cognate3, d = -.17 between cognate3 and non-cognate and d = .23 between non-cognate and unrelated. Cognate2 items were responded to 23ms slower than cognate3 items, cognate3 items were responded to 8ms faster than non-cognates and non-cognates were responded to 33ms faster than unrelated items. *Category* was significant for the English-Dutch language pair for non-cognates in time 1 and cognate2 in time 2. The effect sizes were all small: d = .18 between cognate2 and cognate3, d = -.30 between cognate3 and non-cognate and d = -.02 between non-cognate and unrelated. Cognate2 items were responded to 31ms slower than cognate3 items, cognate3 items were responded to 41ms faster than non-cognates and non-cognates were responded to 5ms slower than unrelated items. For the Frisian-English language pair *Category* was only significant for non-cognates in time 1. The effect sizes between the different word pairs were all small: d = .12 between cognate2 and cognate3, d = -.26 between cognate3 and non-cognate and d = .13 between non-cognate and unrelated. Cognate2 items were responded to 29ms slower than cognate3 items, cognate3 items were responded to 34ms faster than non-cognates and non-cognates were responded to 9ms slower than unrelated items. Finally, *Category* was significant for the English-Frisian language pair for all word pairs except cognate

2 in time 1, for all word pairs in time 2 and cognate2 and cognate 3 in time 3. The effect sizes were all small: d = .07 between cognate2 and cognate3, d = -.17 between cognate3 and non-cognate and d = .08 between non-cognate and unrelated. Cognate2 items were responded to 14ms slower than cognate3 items, cognate3 items were responded to 16ms faster than non-cognates and non-cognates were responded to 13ms faster than unrelated items. What these results show is that although there are significant differences for *Category*, the effect sizes and the differences between the four categories are very small. In other words, there are just minor differences in RTs per prime-target word pair category within the language pairs.

6.5.3.4 Symmetrical priming effects

Like in the LDT, it was also studied whether there were symmetrical priming effects for the WNT: i.e. whether EB had equal RTs for forward (L1 to L3 / L2 to L3) and backward (L3 to L1 / L3 to L2) priming in the different language pairs. Overall, both EB and LB had the fastest RT when they had to name a Dutch word, which was EB's L2 and LB's L1. EB had the slowest RT when they had to name English words, their L3, especially when the prime was Frisian, their L1. LB had the slowest RT when they had to name Frisian words, their L2. The RTs for the L3 English words were faster when the prime was in Dutch (L2 EB / L1 LB) compared to when the prime was in Frisian (L1 EB / L2 LB). No symmetrical translation priming effect was found for EB. For both groups, backward priming was faster than forward priming for the English-Dutch / Dutch-English language pairs. There was a difference in backward and forward priming for the English-Frisian and Frisian-English language pairs for EB and LB. EB had faster backward priming in the English-Frisian language pair than forward priming in the Frisian-English language pair. LB had faster forward priming in the Frisian-English language pair than backward priming in the English-Frisian language pair.

6.5.3.5 Main conclusions Word Naming Task

Looking at the above results the following conclusions can be drawn. The main factors *L1* and *Time* and *Category* are all important predictors on the RTs for the Dutch-English and English-Frisian language pairs. For the English-Dutch and Frisian-English language pairs *Time* and *Category* are more important predictors on the RTs than *L1*.

6.5.4 Comparing LDT and WNT

Comparing the LDT and WNT, some similarities as well as differences are found. First of all, in almost all language pairs in both tasks - except for the first measurement for Dutch-English naming and all three measurements for English-Frisian naming - there is no advantage for EB. EB do not have faster RTs than their LB peers. In fact, there is a disadvantage in the Frisian-English and English-Frisian LDT in which EB have slower RTs than LB. Secondly, faster RTs are registered for the WNT than the LDT. Zooming in on the categories, a difference is seen in RTs on the different prime-target word pairs. This is mostly due to the LDT having a fifth category, pseudo-words, that was not included in the WNT. The pseudo-words are by far responded to slowest. Fastest responses for both tasks are in general on cognate3 and non-cognates. In both tasks, no symmetrical translation priming effect was detected. Finally, in both tasks a development in RTs took place as the school year progressed: participants became faster responding to both tasks.

6.5.5 Overall results

Table 4 provides an overview of all obtained results on both tasks. It shows the significant results as well as the effect sizes. Contrary to expectations there were almost no advantages for EB in trilingual word recognition. First of all, they were less accurate in the LDT than their LB peers, except for English-Frisian items. Secondly, *L1* did not play a major role in the RTs. Except for time 1 in Dutch-English naming and all three measurements for English-Frisian naming, EB's RTs were overall identical or slower than those of LB. It seems that EB were influenced by their L1, Frisian, which inhibited their RTs for the Frisian-English and English-Frisian language pairs in the LDT. The effect sizes of the results were all small to medium, implying that the significant effects were considerable but not big. Taking the categories into account, it can be seen that there were no differences between EB and LB when it came to RTs on the different categories. Both groups were fastest deciding on and naming cognate3 words and non-cognates. Effect sizes were small to medium for the LDT and all small for the WNT. This implies that the differences between the categories was smaller for the WNT than the LDT, due to the LDT having a fifth category - pseudo-words - that was responded to considerably slower than the other four categories.

Table 4. Overview significant results and effect sizes per task and language pair for L1, time and category.

Task and language pair	LDT acc DU-EN	LDT acc EN-DU	LDT acc FY-EN	LDT acc EN-FY	LDT RT DU-EN	LDT RT EN-DU	LDT RT FY-EN	LDT RT EN-FY	WNT RT DU-EN	WNT RT EN-DU	WNT RT FY-EN	WNT RT EN-FY
significance L1	.011	x	.002	.036	x	x	.001	.002	.038	x	x	.003
effect size L1	-.55	x	-.44	.74	x	x	.29	.39	.00	x	x	.25
significance time	.012	x	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000
effect size time 1-2	-.10	x	-.08	-.31	.36	.47	.34	.24	.72	.55	.36	.55
effect size time 2-3	.15	x	.27	.14	.72	.47	.23	.24	.84	.68	.71	.85
effect size time 1-3	.04	x	.19	-.17	1.09	.94	.57	.48	1.56	1.22	1.07	1.40
significance category	-	-	-	-	.000	.000	.000	.000	.000	.000	.000	.000
LDT effect size cat. 1-5	-	-	-	-	-.42	-.45	-.30	-.19	-	-	-	-
LDT effect size cat. 2-5	-	-	-	-	-.44	-.64	-.43	-.27	-	-	-	-
LDT effect size cat. 3-5	-	-	-	-	-.55	-.46	-.05	-.07	-	-	-	-
LDT effect size cat. 4-5	-	-	-	-	-.18	-.42	-.24	-.12	-	-	-	-
WNT effect size cat. 1-2	-	-	-	-	-	-	-	-	.26	.18	.12	.07
WNT effect size cat. 2-3	-	-	-	-	-	-	-	-	-.17	-.30	-.26	-.17
WNT effect size cat. 3-4	-	-	-	-	-	-	-	-	.23	-.02	.13	.08

acc = accuracy scores, RT = reaction time

Furthermore, no differences were found when it came to forward and backward priming which was asymmetrical for both EB and LB. Finally, the development of RTs over time was the same for both EB and LB: overall, they became faster on both tasks during the school year. The significances were all $p = .000$ and the effect sizes were small to large for both tasks and all language pairs implying that the development in faster RTs over time was large. Comparing the two tasks, there are again similarities as well as differences. The main difference is that RTs were much faster for the WNT than the LDT. This could be due to differences in processing components as will be discussed in the following section.

6.6 Discussion

In this part of the dissertation, a LDT and a WNT were used to study lexical access in word recognition between EB and LB. Different hypotheses were formulated. First of all, higher accuracy scores for the LDT for Frisian and English targets were expected for EB compared to LB. Based on the BIA+ model and previous research it was hypothesised that EB would experience facilitation of lexical access for cognates and inhibition of lexical access for non-cognates in all three languages. Next, a symmetrical priming effect was expected for EB. Furthermore, EB were expected to develop their RTs faster during the school year compared to their LB peers. Furthermore, faster development of RTs during the school year was expected for EB because of more language experience compared to LB. Finally, in line with expectations by de Groot et al. (2002), it was expected that RTs would be faster for the WNT than the LDT.

6.6.1 RTs and categories LDT and WNT

6.6.1.1 Accuracy and reaction times Lexical Decision Task

The first hypothesis was that EB would have higher accuracy scores for Frisian and English targets compared to LB. Results showed that this hypothesis is only met for Frisian targets. LB have a higher accuracy scores for the English targets in the Dutch-English and Frisian-English language pairs, which is not in line with the results found in the EFL vocabulary test (chapter 4) and the VOCD (chapter 5) where no differences were found between EB and LB in English vocabulary.

Linked to the BIA+ model, it was also hypothesised that EB would have faster RTs for cognates and slower RTs for non-cognates. EB were expected to experience a rather rapid recognition for cognates because of the orthographic similarities and phonological and semantic overlap of the three languages and slower recognition for non-cognates because of more word candidates. In contrast to results from earlier studies (e.g. Bijeljac-Babic, Biardeau & Grainger, 1997; Duñabeitia, Perea &

Carreiras, 2010) the results of the current study show that there are differences but in the opposite direction than expected. EB do not experience the expected facilitation of their L1 for the LDT but inhibition: they have slower RTs whenever their L1 is involved. Furthermore, EB experience a strong influence of the L1 Frisian prime on the processing of the L3 English target for the Frisian-English language pair and vice versa for the English-Frisian language pair. These effects are significant in the first two measurements for the Frisian-English language pair and for time 1 and 3 for the English-Frisian language pair. The effect sizes are small indicating that the effect has little magnitude. The effect does not show when EB have to respond to a L3 English target with an L2 Dutch prime in the Dutch-English language pair and vice versa in the English-Dutch language pair. LB do not show such an effect of their L1 at all. That this effect is only found for EB could be explained by assuming that EB are hampered by their L1 due to an inhibition effect in which suppressing their (strong) L1 takes so much effort that it slows down their responses. Furthermore, EB might be in L2 mode in the Dutch school environment, inhibiting their L1 Frisian.

Significant differences between the five different prime-target categories are caused by the pseudo-word category. This is by far the category with the slowest RTs which also shows in the small to medium effect sizes. The differences between the remaining four categories (cognate2, cognate3, non-cognate and unrelated) are smaller. Just as is the case in other studies (e.g. Lemhöfer, Dijkstra & Michel, 2004; Hoshino & Kroll, 2008; Szubko-Sitarek, 2011) cognate3 words are responded to faster than cognate2 words. For some language pairs, non-cognates and unrelated words are even responded to faster than cognate2 words. Unlike in other studies (e.g. van Hell & Dijkstra, 2002) this occurrs for both EB and LB. What the results also show is that the biggest differences in RTs are between the Dutch-English and English-Dutch language pairs on the one side and the Frisian-English and English-Frisian language pairs on the other side, which have more small effect sizes. Although the analyses show sigifnicant results, the effect sizes show there is not a lot of difference between the different categories, especially when responding to Frisian targets.

6.6.1.2 Reaction times Word Naming Task

The WNT results partly confirmed the assumptions of the BIA+ model and the related hypothesis that EB would have faster RTs for cognates and slower RTs for non-cognates. There are almost no differences between EB and LB for the Dutch-English, English-Dutch and Frisian-English language pairs. EB are only significantly faster naming Dutch-English items in time 1 but the effect size is small.

In the English-Frisian language pair however, they have significantly faster RTs in all three measurements with a small effect size. It seems that in naming Frisian targets, EB have the advantage of the familiarity of the orthographic and phonological representation of the Frisian language whereas LB have difficulty processing and naming Frisian words, as shown by the differences in RTs. The reason for this difference could be that (as explained in chapter 1) Frisian is mostly a spoken language. Although literacy skills in Frisian are low for both EB and LB, EB most probably find it easier to translate the orthographic information into phonologic information compared to LB who take longer to go through this process. Furthermore, as discussed in section 6.2.2, Frisian is an orthographically deep language, which makes it harder to translate graphemes to phonemes. This is also the case for English, however, the English language is more familiar to the participants as they have had more practise with it.

The RTs for the different prime-target categories show that cognate3 words are responded to fastest by both groups for all four language pairs and unrelated prime-target pairs are mostly responded to slowest. The differences between the four categories however are smaller than those for the LDT as shown by the effect sizes which are all small. This could be explained by the fact that in naming, the semantic component plays less of a role than the phonological component: if the semantic component is not tapped into, this leads to faster processing of the word and hence faster RTs (de Groot et al., 2002). As in the LDT, the differences between the different categories are larger for the Dutch-English and English-Dutch language pairs compared to the Frisian-English and English-Frisian language pairs.

6.6.2 Symmetrical priming effect

In line with the BIA+ model it was hypothesised that EB would show a symmetrical translation priming effect in which equal RTs are expected from L1 to L2 (forward priming) and L2 to L1 (backward priming). Translating this to the three languages under study here this would mean a same effect in RT for EB whether the prime or target is in the L1 or L2, since their degree of bilingualism is higher than that of LB. This is not the case, because when the L1 is involved, whether it acts as the prime or the target, RTs are slower than when the L2 acts as a prime or target. Furthermore, also contrary to expectations, in both the LDT and WNT no symmetrical priming effects are found for EB. Actually, similar effects are found for both groups. For the LDT, backward priming in the English-Dutch language pair is faster than forward priming in the Dutch-English language pair. Forward priming in the Frisian-English language pair is faster than backward priming in the English-Frisian language pair. For the WNT, again backward priming in the English-Dutch language pair is

faster than forward priming in the Dutch-English language pair. The only difference between the two groups is when Frisian and English are involved. EB are faster in the English-Frisian language pair (backward priming) compared to the Frisian-English language pair (forward priming) whilst it is the other way around for LB. Because the results are almost similar for both groups for both tasks, that raises the question what the influence of the language itself is, regardless the proficiency in it. As pointed out in chapter 1 most Frisians (EB or LB) are to a large extent unfamiliar with the Frisian spelling and hence this might explain the above result.

6.6.3 Development over time

As far as development over time is concerned, there is overall an improvement of accuracy in the LDT for both groups, with the exception of the English-Dutch language pair. The significant levels are strong, however, the effect sizes are all but one small so the growth in accuracy is only marginal. It was hypothesised that faster development of RTs was expected for EB during the school year because of more language experience. This hypothesis is not met as both groups develop faster RTs as the school year progresses. Looking at RTs, for both tasks the differences between the two participant groups mostly - with a few exceptions - disappears by the end of the school year as shown by the strong significance level and the overall medium to very high effect sizes. This mostly show for the Dutch-English and English-Dutch language pairs. This first of all implies that the participants' level of English proficiency increases during the school year and hence, their RTs are less influenced by their L1 and/or L2. This also shows that their level of Frisian proficiency does not improve as much as their Dutch and English language proficiency. Although a practice effect might be expected because the same tasks were conducted every measurement and hence explain the development in RTs, the time lag was too long for any clear repetition effects.

6.6.4 Comparing LDT and WNT

In line with de Groot et al. (2002) it was hypothesised that differences between the results of the LDT and WNT would be found. Faster RTs for the WNT than the LDT were expected. Indeed, differences between the two tasks are found. RTs are faster for the WNT than the LDT for both groups for all four language pairs. Participants might have applied the grapheme to phoneme rules when pronouncing the words in the WNT without tapping into the semantic component of the process, which made it faster to respond. In the LDT the semantic component was most likely to be accessed making the response slower.

6.6.5 Comparison EB and LB on results LDT and WNT

As pointed out earlier, the level of activation of the different languages of a multilingual speaker differ, depending on factors such as the frequency of use, proficiency in the languages, and the amount of contact (Cenoz, 2003b; de Bot, 2004). Chapters 4 and 5 pointed out that there are differences between EB and LB when it comes to the amount of language contact and proficiency in languages. Still, in the LDT only EB are inhibited by their L1 and in the WNT EB's L1 facilitates in just one of the four language pairs. Hence, the results show mixed differences in lexical access based on the degree of bilingualism, depending on the given task.

6.7 Conclusion

The objective of focus point lexical access was to find out whether EB and LB show differences in the speed of lexical access in word recognition in their three languages Frisian, Dutch and English due to differences in the degree of bilingualism. Different to expectations, the above results show that EB are not more accurate in the LDT nor do they have faster RTs in the LDT and WNT, compared to LB. EB are less accurate than LB on the LDT. For both the LDT and WNT differences in RTs are found but they are partly in the opposite direction than was expected. This implies that early bilingualism can have a negative influence in the sense that it slows down the RTs whenever the L1 Frisian is involved, with the exception of English-Frisian naming. LB do not show such an effect.

Besides the L1, *Time* is an important factor. Overall accuracy scores and RTs for both EB and LB improve for both tasks and almost all language pairs. Accuracy scores in LDT for all language pairs increase over the school year for both groups. Furthermore, the initial differences in RTs between EB and LB in measurement 1 and 2 mostly disappear in measurement 3. There is just one exception namely LB stay significantly slower in English-Frisian naming. This implies that although literacy skills in Frisian are low for both EB and LB, it is harder for LB to translate the orthographic information into phonologic information and therefore it takes them more time.

As was discussed above, the expectations that were formulated based on the BIA+ model are not all met. First of all, the differences between EB and LB for the LDT are not in the expected direction; EB are not facilitated but inhibited by their L1 and LB show no such effect. The WNT results do partly confirm the expectations; EB have faster RTs in naming items in one of the language pairs (English-Frisian) throughout all three measurements but not in the other three language pairs. The results that are in line with the predictions of the BIA+ model are that cognates are responded to faster than non-cognates for both tasks.

However, unlike predicted by the BIA+ model that claims EB would respond to cognates faster, this is the case for both EB and LB. Secondly, no symmetrical translation priming effects are found for EB, which again is unexpected when looking at the BIA+ model's predictions. Thirdly, only with the exception of the English-Frisian WNT, all initial differences between the two groups disappear by the end of the school year, which results in similar RTs. The increasing level of English proficiency most probably plays a role in this. Finally, there are differences between the results of the LDT and WNT, which implies that, although in both tasks word recognition plays a major role, both tasks also tap into slightly different semantic or phonological components. It can be concluded from these results that the predictions of the BIA+ model are not met. Being a young adolescent EB in two closely related languages does only imply faster lexical access for English-Frisian naming but not for the other language pairs in the WNT nor for all four language pairs in the LDT. Even more so, in the LDT the L1 does not facilitate EB but rather inhibits their RTs. Furthermore, with increasing proficiency of the L3 almost all initial differences between EB and LB disappear. Table 5 shows an overview of the most important conclusions that can be drawn from this chapter.

Table 5. Characteristics EB and LB on lexical access (N=77).

		EB	LB
Accuracy Lexical Decision Task		higher accuracy score Frisian targets	higher accuracy score English targets
Lexical Decision Task		faster RTs Frisian targets	faster RTs English targets with Frisian prime
Word Naming Task		faster RTs Frisian targets	faster RTs English targets with Dutch prime
Development over time	accuracy LDT	gradually higher accuracy, except Dutch targets	overall stable accuracy, except Frisian targets
	RTs LDT	faster RTs, especially sharp decrease when Frisian involved (prime or target)	gradually faster RTs all language pairs
	RTs WNT	faster RTs all language pairs	faster RTs all language pairs

This chapter has shown that in the Frisian context the knowledge of more than one language (EB) does not positively affect accuracy and speed of lexical access in word recognition in L1, L2 and L3. Furthermore, it has shown that being an EB in two closely related languages and having a developing proficiency in the L3 are things that cannot be explained by the BIA+ model as its claims do not seem to count for young learners of closely related languages and lexical competition during acquisition.

Chapter 7 - Discussion and conclusions

7.1 Introduction

The main aim of the current study was to explore the impact of degree of bilingualism on L3 development in three closely related West-Germanic languages: Frisian, Dutch and English. Degree of bilingualism was defined by a differentiation between early Frisian-Dutch bilinguals (EB) and later Dutch-Frisian bilinguals (LB). The main research question addressed was:

> Does degree of bilingualism impact third language development in three closely related West-Germanic languages: Frisian, Dutch and English?

The subject was studied from three focus points: socio-psychological factors, oral language proficiency and lexical access and the development over time was taken into account. Background questionnaires were used to see whether EB and LB differ in the amount of language contact and in language learning attitudes and motivation. Questionnaires on self-assessment of language proficiency, EFL vocabulary tests and picture story tasks in the three languages were used to describe possible differences in (oral) language proficiency. A Lexical Decision Task and a Word Naming Task were used to study participants' accuracy and speed of lexical access in word recognition. Data-collection consisted of three measurements in one school year in which 77 participants participated. Results were analysed using chi-squares and multilevel regression models. The following sections deal with the main outcomes of the different parts of the dissertation and link these to earlier studies in the different fields.

7.2 Socio-psychological factors

L3 development can be influenced by many contextual and individual factors, of which L1 is just one (Cenoz, 2003a). The main aim of the focus point socio-psychological factors was to describe possible differences between EB and LB in language contact and language attitudes and motivation.

Earlier studies have shown that the amount of language contact can be influenced by L1 (e.g. Arocena Egaña, Douwes & Hanenburg, 2010; Pavlenko & Piller, 2007; De Angelis, 2015). In this dissertation, language contact in the Frisian context is mostly influenced by L1. The exposure to Dutch is similar for both participant groups. EB are more exposed to Frisian and LB are more exposed to English through their parents. LB fathers read English newspapers, magazines and books

and listen to English radio more often than EB fathers and this might, compared to EB, play an important role in their exposure to English. Furthermore, LB indicate to watch English TV/DVD more often than their EB peers and this also adds to their English exposure. Gender only plays a role in the amount of reading, which girls do more than boys. Something which was not included in the questionnaire but became clear from discussions with the participants is that boys have a lot of language contact with English through chatting during online gaming. This is in line with the earlier finding in Bonnet's study (2004) in which Swedish boys played more (video)games than girls. The changing digital landscape apparently does not change this, boys still play more (online) games than girls.

As language attitudes and motivation towards languages and language learning are concerned, the dissertation's results show that EB are more positive towards the Frisian language than LB, which is in line with expectations and results found in earlier studies by Lasagabaster (2001) and Cenoz (2001). Furthermore, EB enjoy speaking the Frisian language more, feel more confident speaking it and find it more important to speak it than their LB peers. LB are more negative towards the Frisian language than EB, which is confirmed by earlier results of studies by Benedictus (2005) and Gorter and Ytsma (1988). This can be the result of both the L1 and SES, as these studies showed as well. There might be an influence of the *linguistic self-confidence* (Dörnyei, 2005) here as the quality and quantity of contact with the Frisian language is generally very low for LB. They do however feel more confident speaking the Dutch language compared to their EB peers eventhough the amount of language contact in Dutch is almost similar for both groups. Unlike in other studies (Lasagabaster, 2001; Cenoz, 2001; Ytsma, 2007) and in line with expectations EB are similarly positive about the English language compared to their LB peers. In other words, EB do not view English as a threat for the Frisian language. Furthermore, although at the start of the school year, LB enjoy language learning more than EB this changes during the school year. LB find it increasingly difficult to learn languages. This is where Dörnyei's *possible selves* come into play that represent the language learner's ideas of what they might, want and are afraid of becoming (Dörnyei, 2005). Possibly, LB have experienced negative *L2 language experience* that influences their attitude towards language learning, decreases their intrinsic motivation and negatively influences their *ideal L2 self*. For example, they might find learning languages more difficult than they had envisioned at the start of the school year. The multilevel regression model analyses showed that language attitudes and motivation are also influenced by gender. Girls enjoy speaking the Frisian language more and find speaking Dutch and English more important than boys. The importance of speaking English is something that was supported by

findings by Bonnet (2004) who found that girls view English as more useful than boys. Boys on the other hand find English less important but do feel more confident speaking English, possibly because of their contact with English through gaming.

This part of the dissertation's results partly confirm earlier findings in the same context by Gorter and Ytsma (1988), Benedictus (2005) and Popma and Arocena Egaña (2013) and also other contexts in studies by Lasagabaster (2001), Cenoz (2001), Bonnet (2004) and De Angelis (2015). The main difference compared to these studies is that being EB or LB does not influence how positive participants feel about the English language. What these results furthermore show is that is indeed that being EB or LB does not only involve the degree of bilingualism in L1 and L2 but is related to other factors as well. In the case of this dissertation's participants being an EB implies more exposure to Frisian, more positive towards Frisian and more confident about one's Frisian language skills. Being a LB in this dissertation implies more exposure to English, more negative towards Frisian and more confident about one's Dutch and English language skills. These are important issues that should be taken into account when studying the impact of degree of bilingualism on L3 development.

7.3 Oral language proficiency

The focus point oral language proficiency consisted of three different factors. For self-assessment of language proficiency, EB rate their Frisian language skills higher than their LB peers and LB rate their Dutch and English language skills higher than their EB peers. As in the study by Popma and Arocena Egaña (2013) EB rate their Dutch reading and writing skills considerably higher than their Frisian and English reading and writing skills. However, contrary to their findings, in this dissertation EB rate their Frisian language skills higher than their English language skills. LB on the other hand rate their English language skills higher than their Frisian language skills. Some gender differences were found for self-assessment of language proficiency. Girls rate their Frisian language skills higher than boys who in turn rate their English language skills higher than girls.

The results of the EFL vocabulary test showed no differences between EB and LB. Gender did however influence the results as boys do significantly better on the test than girls in all three measurements.

The level of oral proficiency in Frisian, Dutch and English was studied by looking at fluency, lexical fluency strategies and lexical richness. The main aim was to find out whether the earlier claim that L3 development might be easier for bilinguals than for monolinguals (for a review see Cenoz, 2003a) and the claim that positive transfer is enhanced in typologically related languages (Cenoz, 2003a) also holds for bilinguals in the Frisian context. Several studies that concentrated

on (an aspect of) L3 English development found differences between monolinguals and bilinguals that point in an advantage for bilinguals (Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Brohy, 2001; Safont, 2005). Sagasta (2001) compared bilinguals with different levels of Basque-Spanish on English writing and found that the higher the level of bilingualism the better the English writing proficiency. Some studies that compared early and later bilinguals on L3 English development found no differences (e.g. Cenoz, 1997). The results of the present study differ from the results of the studies mentioned above. In the current study LB are in general more orally proficient in English than EB. LB use less lexical fluency strategies (transfer and lexical and grammatical errors) and have a higher lexical diversity. This result is in contrast with the studies conducted in the Basque Country and Catalonia where advantages were found for early bilinguals (Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Safont, 2005) or no differences were found (Cenoz, 1997).

Another important finding was the clear differences in Frisian proficiency between EB and LB. EB are more orally proficient on all three aspects: fluency, lexical fluency strategies and lexical richness. This underlines the fact that for LB Frisian is truly their L2 and they are not as orally proficient in it as in their L1 Dutch. Moreover, in some of the measured aspects LB's English oral proficiency is higher than their Frisian oral proficiency, which shows in the number of repetitions, transfers and neologisms.

These results show that, despite earlier theories and studies, in the Frisian context early bilingualism is not an advantage in oral L3 English development. High oral proficiency in Frisian and Dutch does not automatically imply a high oral proficiency in English when looking at measures of lexical fluency strategies and lexical richness per measurement. However, what the results also show is that EB know a faster development in some of the (oral) language proficiency measures (self-assessment of English reading and writing and an decrease in use of transfers and neologisms in the English picture story task) so early bilingualism can therefor also not be viewed as a disadvantage. These results give rise to the question what other factors besides degree of bilingualism possibly impact English oral proficiency. The results of chapter 4 were taken into account in the analyses in chapter 5 and revealed that some of the socio-psychological factors influence oral language proficiency. For example, how high participants rate their English speaking skills, how much they are exposed to English digital media and how well they do on the EFL vocabulary test are all related to their English VOCD. These results add to justifying the claim made by Cenoz (2003a) that L1(and in this disseration the degree of bilingualism in L1 and L2) is just one of the many factors that impact L3 development.

7.4 Lexical access

The third focus point of the dissertation concentrated on the accuracy and speed of lexical access in word recognition. Different hypotheses were made based on the BIA+ model (Dijkstra & van Heuven, 2002). The results show differences between EB and LB but they are mostly in the opposite direction than expected and therefore contrary to results from earlier studies (e.g. Bijeljac-Babic, Biardeau & Grainger, 1997; van Hell & Dijkstra, 2002; Duñabeitia, Perea & Carreiras, 2010). In the LDT EB do not experience the expected facilitation of their L1 for the LDT but inhibition: they are less accurate in deciding on whether letter strings are real words or not and have slower RTs whenever their L1 is involved. They furthermore experience a strong influence of the L1 Frisian prime on the processing of the L3 English target for the Frisian-English language pair and vice versa for the English-Frisian language pair. An effect that does not show in a L3 English target with an L2 Dutch prime in the Dutch-English language pair or vice versa in the English-Dutch language pair. The LB do not show such an effect of their L1 at all. This finding suggests that EB are hampered by their L1 due to an inhibition effect in which suppressing their (strong) L1 takes so much effort that it slows down their RTs. Another explanation can be found in the contextual factor, namely that EB might be in L2 mode in the mainly Dutch school environment and as a result inhibit their L1 Frisian. Differences between the five different prime-target categories are caused by the pseudo-word category which is by far the category with the slowest RTs. Smaller differences were found between the remaining four categories (cognate2, cognate3, non-cognate and unrelated) were smaller. In line with results from earlier studies (e.g. Lemhöfer, Dijkstra & Michel, 2004; Hoshino & Kroll, 2008; Szubko-Sitarek, 2011) cognate3 words are responded to faster than cognate2 words. For some language pairs, non-cognates and unrelated words are even responded to faster than cognate2 words. However, unlike in other studies (e.g. van Hell & Dijkstra, 2002) this occurs for both EB and LB.

The results for the WNT only partly confirmed BIA+ model's assumptions. There are almost no differences between EB and LB when it comes to the Dutch-English, English-Dutch and Frisian-English language pairs. The only difference is that in the first measurement of naming Dutch-English items EB are significantly faster than LB. However, in the English-Frisian language pair EB have significantly faster RTs in all three measurements with a small effect size. This implies that in naming Frisian items, the EB have the advantage of the familiarity of the orthographic and phonological representation of the Frisian language whereas the LB have difficulty processing and naming Frisian words, as shown by the differences in RTs. An explanation for this difference could be that (as explained in chapter 1) Frisian is mostly a spoken language and literacy skills in it are low for EB and very low for LB, as is

confirmed by the results of chapter 4. Despite that their proficiency in Frisian literacy skills is low, EB most probably find it easier to translate the orthographic information into phonologic information compared to LB who take longer to go through this process. Another factor that makes Frisian a difficult language to read is that it is an orthographically deep language, which makes it harder to translate graphemes to phonemes. English is also an orthographically deep language but since the English spelling is more familiar to the participants, as they encounter it more often than for example Frisian spelling, it makes visual recognition easier for the participants as they have had more practise with it. The comparisons in RTs for the different prime-target categories (cognate2, cognate3, non-cognate and unrelated) showed that cognate3 words are responded to fastest by both groups which is in line with results from earlier studies (e.g. Lemhöfer, Dijkstra & Michel, 2004; Hoshino & Kroll, 2008; Szubko-Sitarek, 2011). The results are found for all four language pairs. Unrelated prime-target pairs are mostly responded to slowest. These differences in RTs between the different categories are however smaller than those for the LDT. An explanation for this could be that in naming mostly the phonological component plays a role and the semantic component is not tapped into leading to faster processing of the word and hence faster RTs (de Groot, Borgwaldt, Bos & van den Eijnden, 2002).

One of BIA+ model's claims was that EB show a symmetrical translation priming effect in which equal RTs are expected from L1 to L2 (forward priming) and L2 to L1 (backward priming). Despite that other studies found this effect (e.g. Duñabeitia, Perea & Carreiras, 2010) this is not found in the current study. Whenever the L1 is involved, whether it acts as the prime or the target, RTs are slower than when the L2 acts as a prime or target. In both the LDT and WNT no symmetrical priming effects are found for the EB. Because the results are almost similar for both groups for both tasks, this gives rise to the question what the influence of the language itself is, regardless the proficiency in it. As pointed out in sections 1.1 and 5.2, most Frisians (EB or LB) are to a large extent unfamiliar with the Frisian spelling and hence this might explain the above result.

These results show that for both the LDT and the WNT EB do not necessarily experience facilitation of lexical access for cognates and inhibition of lexical access for non-cognates in the three languages. In fact, in the LDT they experience inhibition of their L1 rather than facilitation. In the WNT they only experience facilitation of their L1 for the English-Frisian language pair. Also, no symmetrical priming effects are found for EB. As was pointed out earlier, the level of activation of the different languages of a multilingual speaker differ, is affected by many contextual and individual factors such as the frequency of use, proficiency in the languages, and the amount of contact (Cenoz, 2003b; de Bot, 2004). Chapters 4 and 5 pointed out that there are

differences between EB and LB when it comes to the amount of language contact, language attitudes and motivation towards languages and language learning, self-assessment of language proficiency and oral proficiency in the languages. In line with these findings, the results of the lexical access focus point show no advantage for EB. EB are mostly inhibited by their L1 and not facilitated as the BIA+ model claims.

7.5 Development over time

The development over time was looked at in all three focus points: socio-psychological factors, oral language proficiency and lexical access. During the school year, as time progressed, factors such as language contact and instruction in the languages could change, influencing language development. For the focus point socio-psychological factors development over time does not play a major role for the EB, who stay rather stable in the amount of language contactand their motivation and attitudes towards language learning. LB show some more fluctuations: they become more negative towards the Frisian language and enjoy language learning less as the school year progresses. This is an indication that motivation can be dynamic, as is claimed by Dörnyei (2005).

For the focus point oral language proficiency development over time shows interesting results as oral proficiency shows fluctuations for both EB and LB. First of all, EB show a steeper development of self-assessment of their English reading and writing skills compared to LB whereas LB do not find it easier to learn languages as the school year progresses. Based on the results of the picture story tasks, the participants do not necessarily get higher orally proficiency during the school year. The average number of words per picture story task increases during the school year and the number of repetitions and transfer decreases. However, the number of prompts in Frisian and English increases during the school year. Also, the number of neologisms, lexical and grammatical errors as well as the lexical diversity fluctuates. This trend is very typical of (additional) language learning, as, as pointed out earlier, language development knows variability (Schmid, Verspoor & MacWhinney, 2011; de Bot et al., 2007).

For the focus point lexical access the role of development over time shows that participants obtain better results (improvement of accuracy and faster RTs) during the school year. The initial differences between the participant groups mostly disappears by the end of the school year, especially for the Dutch-English and English-Dutch language pairs. Despite the fact that the English oral proficiency does not clearly improve during the school year (as shown in chapter 5) the results of the experiments do seem to point in an increase of participants' level of English proficiency during the school year for both EB and LB as accuracy scores in the LDT improved and RTs in the LDT and WNT become faster.

7.6 Discussion

What this dissertation has shown is that early bilingualism in the Frisian context is not an asset as it does not provide clear advantages in L3 development compared to later bilingualism. LB score better on some measures in English (self-assessment of language skills, use of lexical fluency strategies, lexical diversity, accuracy scores LDT) compared to EB. However, early bilingualism in the Frisian context is also not an obstacle for L3 development. Development over time shows that EB know a faster progress during the school year in several measures in English (self-assessment of English reading and writing, decrease in number of repetitions and transfers in English picture story task, accuracy scores and RTs LDT) compared to LB. Furthermore, the results show that a majority of the initial differences between the two participant groups that direct in an advantage for the LB disappear in the time course of the school year. What this dissertation further has shown is that there are many factors, besides the degree of bilingualism, that play a role in L3 development. For example, gender, language contact, attitudes and motivation towards language learning and self-assessment of language proficiency all influence and contribute to L3 development. This dissertation also demonstrated that when looking at different points of focus of L3 development, different and sometimes contrasting results are found. For example, no clear improvement of English oral proficiency is found but still, accuracy and speed in the LDT and WNT do improve, suggesting a higher English proficiency. This dissertation has further shown that L3 development in the Frisian context is rather unique and contrasting results are found compared to other studies in the different fields that included different language combinations and took place in different contexts. The Frisian situation is unique for several reasons. First of all, there is the close relationship between the languages. In contrast to what was expected, this close relationship seems to be more of a disadvantage than an advantage. This for example showed in the RTs of EB whenever Frisian was involved as a target or prime, which inhibited rather than facilitated their RTs. Secondly, there is the large amount of exposure to English, through television and the Internet but also through parents. The results show that compared to EB, LB are more exposed to English through their parents. Thirdly, language attitude and motivation towards languages and language learning are different than in other similar studies. LB feel more confident about their English language skills but enjoy language learning less compared to EB. Together these results point to LB being better English language learners but EB seem faster English language learners.

7.7 Limitations of the project

There are several limitations to this project. The first being that the third group of participants participated in two of the three measurements. The results of the different parts of the dissertation show that this (negatively or positively) influenced the results. However, the biggest disadvantage is that there is no data available of their baseline in English at the start of the school year. A second limitation is the rating of the Frisian language in the picture story tasks. This was done using strict guidelines as set by the dictionaries used and Frisian lexicographers that were consulted. What became clear from the number of lexical and grammatical errors made by LB but especially by EB is that the Frisian language is changing. The younger generation uses a lot of Dutch transfers, giving the Frisian language a facelift and making it more their own. The disadvantage of the way the Frisian language was rated was that it was perhaps too strict and did not entirely reflect this participants' generation's Frisian. A third limitation is the use of written items in the experiments. Because of the limited literacy skills in Frisian, it might have been better to use a Picture Naming Task instead of a Word Naming Task.

7.8 Directions for future research

This dissertation adds new information to the field of studies on trilingualism because it took a different approach than previous studies: it looked at closely related languages from different perspectives at different time points. However, the results also lead to new questions. In a study by Sanz (2000) that compared Catalan-Spanish bilinguals and Spanish monolinguals on English acquisition it was found that biliteracy in Catalan and Spanish and not the balance in oral Catalan and Spanish proficiency was a significant predictor of L3 scores. This raises the question whether EB who are biliterate in Frisian and Dutch would show an advantage in English as an L3 development compared to LB who are only literate in Dutch.

In light of the results of the WNT it would be interesting to do further research into word production, especially language-switching with picture naming - and so avoiding the influence of low literacy in Frisian - to see whether EB might use a different selection mechanism in lexical access in language production compared to LB, as did the highly proficient bilinguals in a study by Costa and Santesteban (2004). However, the opposite result could also be obtained, namely that there is no different selection mechanism between EB and LB.

Finally, by replicating Melinger's picture naming study (2018) it could be studied whether EB are good at separating their linguistic systems. As Melinger (2018) found, dialect speakers might not be as good at separating their language

systems as speakers of languages/dialects that are more distant. Since Frisian is so heavily influenced by Dutch, a similar effect as in Melinger's study might be found.

7.9 Conclusions

What this dissertation has shown is that in the Frisian context, EB have no clear advantage nor disadvantage of their high degree of bilingualism compared to LB in developing L3 English. The different focus points showed that there are differences in language contact, motivation and attitudes towards languages and language learning, self-assessment of language proficiency, oral language proficiency and accuracy and speed of lexical access in word recognition. Opposite to what was expected, based on earlier studies that found bilinguals having an advantage acquiring English as an L3 compared to monolinguals (Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Brohy, 2001; Safont, 2005), in the current study this was not found. Compared to LB, EB were less exposed to English, rated their English proficiency lower, were also less proficient and had lower accuracy scores and slower RTs for English targets in some language pairs of the LDT and WNT. However, development over time showed that EB did progress faster than LB on some measurements and part of the initial differences between the two groups disappeared as the school year progressed. Hence, early bilingualism in the Frisian context turns out to be not an asset but nor is it an obstacle.

This dissertation adds new perspectives that can possibly help educators and education policy makers in developing English language programmes, for example by giving more attention to language exposure and language motivation which in in this dissertation turned out to be important predictors of successful L3 development.

This dissertation furthermore adds new perspectives to the field of studies on trilingualism because it looked at closely related languages from different focus points and at several time points, something that had not been done before. Contrary to previous results this dissertation's results showed that a higher degree of bilingualism in Frisian and Dutch was not the best predictor of successful L3 development. The two participants groups had similar reaction times on the experiments and the picture story tasks' results showed that LB had a higher proficiency in English but EB developed faster on both tasks. Not degree of bilingualism but other factors such as language contact with English and self-assessment of English language proficiency, which were in general higher amongst the LB, played a more important role. All these reasons together cause EB not being able to live up to the myth that Frisian speakers are better English language learners but they do seem to be faster English language learners.

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Appendices

Appendix A - pupil questionnaire (measurement 1)

Vragenlijst

De vragen hieronder gaan over taal. We willen graag weten hoeveel talen jij geleerd hebt, hoe goed je deze talen beheerst en hoeveel je ze gebruikt.
Het is GEEN taaltoets of proefwerk waar je een cijfer voor krijgt. Beantwoord de vragen zo eerlijk mogelijk en beantwoord alle vragen. Je antwoorden blijven natuurlijk anoniem. Alleen de onderzoekers zullen deze onder ogen krijgen.

Deel A – Algemeen

Vul eerst de volgende gegevens in.

1. Mijn naam is: .....
2. Ik ben een: ❍ jongen ❍ meisje
3. Ik ben geboren op: ..... (dag/maand/jaar)
4. Ik zit in klas ..... van school .....

Nu stellen we je een paar algemene vragen over je achtergrond.

5. Ben je geboren in Nederland? Ja / Nee
6. Ben je ook geboren in Friesland? Ja / Nee
7. Hoe lang woon je al in Friesland?

Als je in Nederland bent geboren, sla dan vraag 8 over en ga verder met vraag 9.

8. Indien je niet in Nederland bent geboren:
   a. Hoe oud was je toen je in Nederland kwam wonen? .....
   b. Ben je ooit voor een periode van langer dan 6 maanden teruggekeerd naar je geboorteland? Ja / Nee
      Zo ja, hoe lang: .....

Deel B – Thuis

De volgende vragen gaan over de talen die je thuis met je familie spreekt.

9. Welke taal / talen spreek je met je ouder(s)/verzorger(s)?
   ❍ Alleen Fries
   ❍ Alleen Nederlands
   ❍ Zowel Fries als Nederlands
   ❍ Anders, namelijk .....

10. Heb je broer(s) en/of zus(sen)? Ja / Nee

Als je geen broer(s)/zus(sen) hebt, sla dan vraag 11 en 12 over en ga verder met vraag 13.

11. Hoe oud zijn je broer(s) en/of zus(sen)?
    De leeftijd van broer / zus nr 1. is ..... jaar
    De leeftijd van broer / zus nr 2. is ..... jaar
    De leeftijd van broer / zus nr 3. is ..... jaar
    De leeftijd van broer / zus nr 4. is ..... jaar

12. Welke taal / talen spreek je met je broer(s) / zus(sen)?
    ❍ Alleen Fries
    ❍ Alleen Nederlands
    ❍ Zowel Fries als Nederlands
    ❍ Anders, namelijk .....

Deel C – Taalachtergrond

De volgende vragen gaan over je taalachtergrond

13. Wat is je moedertaal (de taal die je als klein kind van je ouder(s) / verzorger(s) hebt geleerd)?

    .....

14. Welke taal spreek je zelf het liefst?
    - ❍ Alleen Fries
    - ❍ Alleen Nederlands
    - ❍ Zowel Fries als Nederlands
    - ❍ Anders, namelijk .....

15. Spreek je, afgezien van Fries, ook een dialect / streektaal (bijv. Súdhoeksk)? Ja / Nee
    Zo ja, welk dialect / streektaal? .....

16. Welke talen spreek je nog meer? *(vul ook de talen in die je maar een beetje spreekt)*

    .....

17. Hoe leuk vind je het in het algemeen om een nieuwe taal te leren?
    1 = niet leuk 2 = niet zo leuk 3 = neutraal 4 = een beetje leuk 5 = leuk

18. Hoe gemakkelijk vind je het in het algemeen om een nieuwe taal te leren?
    1 = moeilijk 2 = een beetje moeilijk 3 = neutraal 4 = een beetje gemakkelijk 5 = gemakkelijk

19. Geef, voor alle talen die je hebt geleerd, in de tabel hieronder aan waar en op welke leeftijd je deze taal hebt geleerd.

Taal	**Vanaf welke leeftijd heb je de taal geleerd?**	**Waar heb je de taal geleerd? (school, thuis of anders)**
Fries		
dialect		
Nederlands		
Engels		
.....		

20. Geef, voor alle talen die je hebt geleerd, aan hoe goed je deze beheerst door op de volgende schaal één van de cijfers te omcirkelen:
    1 = helemaal niet 2 = niet goed 3 = voldoende 4 = goed 5 = zeer goed

Taal	**Spreken**	**Luisteren**	**Schrijven**	**Lezen**
Fries	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
dialect	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Nederlands	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Engels	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
.....	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

21. Geef, voor alle talen die je hebt geleerd, aan in hoeverre je het eens bent met de uitspraken uit de tabel. Gebruik de volgende schaal en omcirkel het antwoord van jouw keuze.
1 = mee oneens 2 = beetje mee oneens 3 = neutraal 4 = beetje mee eens 5 = mee eens

Taal	**Ik vind het leuk om deze taal te spreken**	**Ik voel me zeker van mezelf als ik deze taal spreek**	**Ik vind het belangrijk om deze taal goed te kunnen spreken**
Fries	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
dialect	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Nederlands	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Engels	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
.....	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

22. Geef, voor alle door jou vermelde talen (ook een eventuele streektaal / dialect), in de volgende tabel aan welke taal je gebruikt voor de volgende activiteiten en gedurende hoeveel uren per dag.

Activiteit	**Taal**	**Aantal uren per dag**	**Aantal uren per week**
Lezen			
TV / dvd kijken			
Luisteren naar muziek			
E-mail/Internet			

23. Kruis hieronder aan in welke taal je telt, droomt, boos bent, etc. Je kunt meerdere talen aankruisen!

	Fries	**Nederlands**	**Engels**	**Anders, nl.:**
a) Welke taal gebruik je bij voorkeur als je hardop moet tellen of rekenen?				
b) Welke taal gebruik je bij voorkeur als je spreekt tegen baby's, kleine kinderen, of huisdieren?				
c) Welke taal gebruik je meestal/bij voorkeur als je boos bent?				
d) Welke taal gebruik je meestal/bij voorkeur als je geschrokken/verdrietig bent?				
e) In welke taal druk je je over het algemeen het makkelijkste uit?				
f) In welke taal 'denk' je meestal?				
g) In welke taal droom je?				

Deel D – Engels op school

De volgende vragen gaan over hoeveel Engelse les je hebt gehad en hoe de Engelse lessen gaan.

24. Heb je Engels gehad op de basisschool? Ja / Nee
    Zo ja; hoeveel jaar heb je Engels gehad op de basisschool?
    ❍ 1 - 2 jaar
    ❍ 3 - 4 jaar
    ❍ 5 - 6 jaar
    ❍ weet ik niet.

25. Heb je wel eens bijles Engels gehad? Ja / Nee
    Zo ja; hoeveel uur in totaal ongeveer? .....

26. Heb je op dit moment bijles Engels? Ja / Nee

27. Heb je wel eens buiten school een cursus Engels gevolgd? Ja / Nee
    Zo ja; waar? .....
    Zo ja; hoeveel uur in totaal ongeveer? .....

De volgende vragen gaan over het gebruik van Engelse radio-opnamen, cd's, TV en video/dvd in de Engelse les ***op school****.*

28. Welke taal spreekt je docent(e) Engels tijdens de les?
    ❍ Alleen Engels
    ❍ Meer Engels dan Nederlands
    ❍ Evenveel Engels als Nederlands
    ❍ Meer Nederlands dan Engels
    ❍ Alleen Nederlands
    ❍ Anders, namelijk .....

29. Kruis hieronder aan of je docent(e) Engels wel eens gesproken Engels materiaal gebruikt in de Engelse les.

	Ja				**Nee**
	minder dan 1 keer per maand	1 - 3 keer per maand	1 keer per week	meer dan 1 keer per week	
a) Gebruikt je docent(e) wel eens opnamen van Engelse radioprogramma's of Engelse muziek in de les?					
b) Kijken jullie wel eens naar opnamen van gewone Engelse TV-programma's of Engelse dvd's in de les?					

30. Deze vraag gaat over waar je het meeste Engels geleerd hebt. Geef een schatting van welk deel van jouw kennis je op school hebt geleerd en welk deel je buiten school hebt geleerd door bij beide opties één van de percentages te omcirkelen.
    Op school: 0% 25% 50% 75% 100% Buiten school: 0% 25% 50% 75% 100%

Deel E – Engels buiten school

De volgende vragen gaan over of je zelf wel eens Engelse radio/muziek luistert of Engelse TV/dvd kijkt ***buiten school****.*

31. Kruis hieronder aan of je buiten schooltijd wel eens naar Engelse tv-programma's kijkt of naar Engelse radio luistert.

	Ja				**Nee**
	minder dan 1 keer per maand	1 - 3 keer per maand	1 keer per week	meer dan 1 keer per week	
a) Kijk je buiten schooltijd wel eens naar TV-programma's of dvd's in het Engels (met Nederlandse ondertiteling)?					
b) Luister je buiten schooltijd wel eens naar radioprogramma's in het Engels?					

32. Hoeveel **uur per week** luister je buiten schooltijd ongeveer naar muziek?
- ❍ ik luister niet naar muziek
- ❍ 1-3 uur per week
- ❍ 4-8 uur per week
- ❍ 9-12 uur per week
- ❍ 13 uur per week of meer

33. Luister je meer naar Engelstalige muziek of meer naar Fries- of Nederlandstalige muziek?
- ❍ Alleen Engels
- ❍ Meestal Engels
- ❍ Iets meer Engels
- ❍ Ongeveer evenveel
- ❍ Iets meer Fries / Nederlands
- ❍ Meestal Fries / Nederlands
- ❍ Alleen Fries / Nederlands
- ❍ Niet van toepassing

34. Ben je wel eens op vakantie geweest in een land waar je Engels moest gebruiken om jezelf verstaanbaar te maken? Ja / Nee
Zo ja; in welke landen ben je geweest en hoeveel weken in totaal ongeveer? .....
.....

35. De laatste vraag gaat over welke mogelijkheden je hebt om in contact te komen met het Engels. Hieronder staat een vragenlijst met mogelijkheden. Omcirkel voor iedere mogelijkheid welke omschrijving jouw situatie het beste weergeeft:
1 = nooit 2 = soms 3 = vaak 4 = heel vaak

Ik kom in contact met het Engels door:

a.	Docent(e) Engels	1	2	3	4	h.	Cd's / iPod	1	2	3	4
b.	Ouder(s) / verzorger(s)	1	2	3	4	i.	Bioscoop	1	2	3	4
c.	Broer(s) / zus(sen)	1	2	3	4	j.	Kranten	1	2	3	4
d.	Vrienden	1	2	3	4	k.	Tijdschriften	1	2	3	4
e.	Muziek op de radio	1	2	3	4	l.	Boeken	1	2	3	4
f.	Spraak op de radio	1	2	3	4	m.	Computer/internet	1	2	3	4
g.	TV / dvd	1	2	3	4						

Bedankt voor het invullen van de vragenlijst!

Appendix B - parent questionnaire

FRYSKE AKADEMY 75 JIER

Vragenlijst voor ouders

Beste ouder(s)/verzorger(s),

Deze vragenlijst hoort bij het promotieonderzoek naar de Engelse taalontwikkeling van 1e-jaars HAVO/VWO leerlingen in Friesland, waarover u eerder per brief bent ingelicht. Uw zoon/dochter doet mee aan dit onderzoek. Om meer inzicht te krijgen in de (taal)achtergrond en taalomgeving van uw zoon/dochter willen we u vriendelijk verzoeken deze vragenlijst in te vullen.
Uw antwoorden worden uiteraard strikt vertrouwelijk behandeld en anoniem gemaakt. Wilt u de vragenlijst invullen en meegeven aan uw zoon/dochter? Hij/zij kan het bij mij inleveren op school.

Met vriendelijke groet, mei freonlike groetnis,
Mirjam Günther-van der Meij MA

T 058 - 234 3057
E mguenther@fryske-akademy.nl

Deel A - Achtergrondgegevens kind
Wanneer in deze vragenlijst over uw zoon/dochter gesproken wordt, wordt die zoon/dochter bedoeld die meedoet met het onderzoek.

1. **Wat is de naam van uw zoon/dochter?**
   .....
2. **Op welke school zit hij/zij?**
   .....
3. **Hoeveel kinderen telt uw gezin?**
   ..... kind(eren).
4. **Hoeveelste kind is uw zoon/dochter, die meedoet aan dit onderzoek?**
   Hij/zij is het ..... kind.

Deel B - Achtergrondgegevens ouders
De volgende vragen gaan over u als ouder/verzorger. Vaak wordt zowel naar u gevraagd als naar uw partner. Bij deze vragen staat dan zowel een vakje voor 'vader' als voor 'moeder'. Mocht u de voogdij delen, dan wordt in de vragen over uw gezin het gezin bedoeld waar uw zoon/dochter de meeste tijd verblijft. Mocht(en) (één van) de ouders niet de biologische ouder(s) zijn, dan geldt de vraag voor de verzorger(s) van uw zoon/dochter. Woont u alleen met uw kind(eren), dan vult u de vragenlijst alleen voor uzelf in.

-1-

5. Wat is uw geslacht?
(het geslacht van degene die (het grootste gedeelte van) deze vragenlijst invult)
☐ Man
☐ Vrouw

6. Wat is op u van toepassing?
☐ Getrouwd/samenwonend
☐ Uit elkaar/gescheiden
☐ Weduwe/weduwnaar
☐ Alleenstaand

7. Wat is uw leeftijd?

	0-25	26-30	31-35	36-40	41-45	46+
Vader	☐	☐	☐	☐	☐	☐
Moeder	☐	☐	☐	☐	☐	☐

8. Wat is de hoogst gevolgde opleiding die u hebt afgerond?

vader	**moeder**	
☐	☐	Universitair (WO)
☐	☐	Hoger beroepsonderwijs (HBO)
☐	☐	Middelbaar Beroepsonderwijs (MBO)
☐	☐	Lager of Voorbereidend Beroepsonderwijs (bijv. LBO, LTS, VBO)
☐	☐	Gymnasium/VWO/Atheneum
☐	☐	HAVO
☐	☐	MAVO
☐	☐	VMBO
☐	☐	Lagere school, Basisonderwijs

9. Werkt of studeert u op dit moment?
Vader:
Ja, mijn beroep is ……
Ja, mijn studie is ……
Nee, ik werk/studeer momenteel niet maar heb eerder gewerkt als: ……

Moeder:
Ja, mijn beroep is ……
Ja, mijn studie is ……
Nee, ik werk/studeer momenteel niet maar heb eerder gewerkt als: ……

10. Welke taal heeft u als kind het eerste geleerd?

vader	**moeder**		
☐	☐	Fries	
☐	☐	Nederlands	
☐	☐	Fries en Nederlands	
☐	☐	Weet ik niet (meer)	
☐	☐	Anders*, namelijk:	vader: .....
			moeder: .....

* Hier vult u de andere taal in. U kunt 'anders' ook aankruisen en aanvullen wanneer het om het Stadsfries (bijv. Leeuwarders, Snekers, Franekers, etc.) gaat of een streektaal (bijv. Bildts, Stellingwerfs, Drents, etc.).

Deel C - Taalomgeving kind

De volgende vragen hebben betrekking op de taalomgeving van uw zoon/dochter.

11. Welke taal spreekt u gewoonlijk tegen uw kind(eren)?

vader	moeder	
☐	☐	Alleen Fries
☐	☐	Meestal Fries
☐	☐	Evenveel Fries als Nederlands
☐	☐	Meestal Nederlands
☐	☐	Alleen Nederlands
☐	☐	Anders*, namelijk: vader: .....
		moeder: .....

12. Welke taal spreekt uw zoon/dochter gewoonlijk tegen u?

tegen vader	tegen moeder	
☐	☐	Alleen Fries
☐	☐	Meestal Fries
☐	☐	Evenveel Fries als Nederlands
☐	☐	Meestal Nederlands
☐	☐	Alleen Nederlands
☐	☐	Anders*, namelijk: vader: .....
		moeder: .....

13. Welke taal spreken uw kinderen gewoonlijk onderling? In het geval één van uw overige kinderen nog niet spreekt, noteer dan de taal die uw zoon/dochter tegen hem/haar gebruikt.

☐ Niet van toepassing, onze zoon/dochter is enig kind
☐ Alleen Fries
☐ Meestal Fries
☐ Evenveel Fries als Nederlands
☐ Meestal Nederlands
☐ Alleen Nederlands
☐ Anders*, namelijk .....

14. Kruist u bij de volgende vraag a.u.b. aan of <u>u zelf</u> weleens naar Friese, Nederlandse en/of Engelse programma's kijkt, muziek luistert of in deze taal/talen leest.

	Fries	Nederlands	Engels
Tv-programma's			
Film op dvd/digitaal			
Muziek op cd/digitaal			
Radioprogramma			
Boeken			
Kranten			
Tijdschriften			

* Hier vult u de andere taal in. U kunt 'anders' ook aankruisen en aanvullen wanneer het om het Stadsfries (bijv. Leeuwarders, Snekers, Franekers, etc.) gaat of een streektaal (bijv. Bildts, Stellingwerfs, Drents, etc.).

15. Kruist u bij de volgende vraag a.u.b. aan of uw partner weleens naar Friese, Nederlandse en/of Engelse programma's kijkt, muziek luistert of in deze taal/talen leest.

	Fries	Nederlands	Engels
Tv-programma's			
Film op dvd/digitaal			
Muziek op cd/digitaal			
Radioprogramma			
Boeken			
Kranten			
Tijdschriften			

16. Kruist u bij de volgende vraag a.u.b. aan of uw zoon/dochter thuis weleens naar Friese, Nederlandse en/of Engelse programma's kijkt, muziek luistert of in deze taal/talen leest.

	Fries	Nederlands	Engels
Tv-programma's			
Film op dvd/digitaal			
Muziek op cd/digitaal			
Radioprogramma			
Boeken			
Kranten			
Tijdschriften			

Ruimte voor commentaar of andere opmerkingen:

.....
.....
.....
.....
.....
.....

Hartelijk dank voor het invullen van de vragenlijst!

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Appendix C - LDT and WNT word lists

LDT Frisian-English language pair

Category	Prime	Target
Cognate3	húswurk	HOMEWORK
Cognate3	kanaal	CANAL
Cognate3	sied	SEED
Cognate3	bom	BOMB
Cognate3	ring	RING
Cognate3	lippe	LIP
Cognate3	sport	SPORT
Cognate3	glês	GLASS
Cognate3	lieder	LEADER
Cognate3	figuer	FIGURE
Cognate2	bân	TIRE
Cognate2	skrift	NOTEBOOK
Cognate2	knoop	BUTTON
Cognate2	sturt	TAIL
Cognate2	spier	MUSCLE
Cognate2	jurk	DRESS
Cognate2	aai	EGG
Cognate2	wâld	FOREST
Cognate2	beker	CUP
Cognate2	spul	GAME
Semantic	mûle	MOUTH
Semantic	wyn	WIND
Semantic	merk	MARKET
Semantic	nulle	NEEDLE
Semantic	wjok	WING
Unrelated	auto	PORTRAIT
Unrelated	buro	PRINCESS
Unrelated	roas	BEER
Unrelated	tiger	SHOE
Unrelated	man	THEATRE
Unrelated	bonge	TEA
Unrelated	flie	DAUGHTER
Unrelated	souwe	MUSIC
Unrelated	spek	PAPER
Unrelated	pink	GROUP
Unrelated	poal	BUG
Unrelated	oefte	TROUSERS
Unrelated	moarch	STOMACH
Unrelated	nuver	CLOUD
Unrelated	jûkte	BUYER
Unrelated	lij	WEATHER
Unrelated	hôf	TRACK
Unrelated	flappe	DOG
Unrelated	fôle	VOICE
Unrelated	útbou	WOMAN
Unrelated	kiuw	LANE
Unrelated	fink	POLICE
Unrelated	jiske	WAY
Unrelated	foan	FENCE
Unrelated	bont	SKY

Category	Prime	Target
Pseudoword	sjippe	WHEST
Pseudoword	leppel	BRUP
Pseudoword	frucht	BRIC
Pseudoword	fyts	CULAN
Pseudoword	skjirre	SCEIL
Pseudoword	brân	AFRON
Pseudoword	keizel	KEIL
Pseudoword	kleed	REEM
Pseudoword	aapke	DAILS
Pseudoword	mich	BRITE
Pseudoword	kanne	MAKS
Pseudoword	takke	NEEL
Pseudoword	sûpe	KNOOR
Pseudoword	podde	BOUS
Pseudoword	sebra	AMBOLD
Pseudoword	sjem	AGARD
Pseudoword	falk	ALBRE
Pseudoword	bûgel	RYPE
Pseudoword	gûne	ACKS
Pseudoword	spoek	ANGLY
Pseudoword	sop	GREAN
Pseudoword	rêch	RAMB
Pseudoword	kjers	KAUD
Pseudoword	prûm	PEEZE
Pseudoword	moal	BRAP
Pseudoword	kafee	WRUNE
Pseudoword	keat	CHEIN
Pseudoword	klút	PANAR
Pseudoword	waarle	KLEET
Pseudoword	matrys	CINER
Pseudoword	beuker	FORTLE
Pseudoword	oerjas	CRUCH
Pseudoword	dong	DIAST
Pseudoword	traper	GOVEN
Pseudoword	drek	COUD
Pseudoword	matroas	NORCH
Pseudoword	baalje	ACCO
Pseudoword	biis	LUIP
Pseudoword	bile	HOTA
Pseudoword	brol	STOON
Pseudoword	eart	JAND
Pseudoword	fin	EALS
Pseudoword	fûst	SPAND
Pseudoword	gebyt	FLACE
Pseudoword	hage	SPING
Pseudoword	stege	PROUSE
Pseudoword	jirpel	PLOW
Pseudoword	luif	MOTRY
Pseudoword	pearel	DOURN
Pseudoword	lôge	GURD

LDT English-Frisian language pair

Category	Prime	Target
Cognate3	footstep	FUOTSTAP
Cognate3	album	ALBUM
Cognate3	sheep	SKIEP
Cognate3	sugar	SÛKER
Cognate3	fruit	FRUIT
Cognate3	bridge	BRÊGE
Cognate3	scale	SKAAL
Cognate3	park	PARK
Cognate3	contract	KONTRAKT
Cognate3	street	STRJITTE
Cognate2	bun	BROADSJE
Cognate2	cage	KOAI
Cognate2	paint	FERVE
Cognate2	tie	DAS
Cognate2	uncle	OMKE
Cognate2	roof	DAK
Cognate2	airplane	FLEANTÚCH
Cognate2	kitchen	KEUKEN
Cognate2	lady	DAME
Cognate2	food	ITEN
Semantic	envelope	SLÛF
Semantic	toy	BOARTERSGUOD
Semantic	wheel	TSJIL
Semantic	gift	SKINKING
Semantic	baby	POPPE
Unrelated	meter	SJUERY
Unrelated	bank	TUNNEL
Unrelated	firm	STIEL
Unrelated	rail	KUST
Unrelated	ambyld	PRINS
Unrelated	point	BAL
Unrelated	wine	SINNE
Unrelated	mum	HART
Unrelated	bus	PASJINT
Unrelated	gap	DING
Unrelated	boss	MIER
Unrelated	moon	FEE
Unrelated	flesh	HIMEL
Unrelated	post	FLEIS
Unrelated	card	HIERDER
Unrelated	motor	FLESSE
Unrelated	bronze	HEUVEL
Unrelated	panel	LEGER
Unrelated	flight	KEUNST
Unrelated	budget	MINSKEN
Unrelated	film	HAKKE
Unrelated	round	WEACH
Unrelated	vat	SKAAD
Unrelated	mile	EARMTAKKE
Unrelated	path	HOLLE

Category	Prime	Target
Pseudoword	lap	LOM
Pseudoword	turtle	BJUST
Pseudoword	comic	KNAFT
Pseudoword	trunk	MEALSK
Pseudoword	lawn	WIELSK
Pseudoword	price	TOTS
Pseudoword	centre	BITLIK
Pseudoword	war	SPINK
Pseudoword	law	WETTEL
Pseudoword	court	KRUT
Pseudoword	chart	SJÛM
Pseudoword	ward	SJYP
Pseudoword	dust	MEON
Pseudoword	nerve	EAN
Pseudoword	twin	STRÔCH
Pseudoword	brick	FELP
Pseudoword	wire	SELK
Pseudoword	poetry	OAL
Pseudoword	fabric	KLOEI
Pseudoword	dish	WAPSK
Pseudoword	poet	KITER
Pseudoword	diary	ULK
Pseudoword	host	TSJAL
Pseudoword	hero	GOAN
Pseudoword	poll	GNILK
Pseudoword	sink	AGER
Pseudoword	neat	NÊD
Pseudoword	iron	AKEL
Pseudoword	pool	SMURD
Pseudoword	wage	UKEL
Pseudoword	smile	SNIEM
Pseudoword	entry	BLIE
Pseudoword	cash	SNOAL
Pseudoword	chip	SNEA
Pseudoword	bay	SMÛNK
Pseudoword	zone	IMMEL
Pseudoword	peak	FEA
Pseudoword	holder	KLEA
Pseudoword	rove	RÛPTE
Pseudoword	taw	SLAKTE
Pseudoword	truss	LÛNK
Pseudoword	shed	DWELP
Pseudoword	gear	KROAL
Pseudoword	axe	KNOS
Pseudoword	alley	NILD
Pseudoword	char	BLÊSK
Pseudoword	crow	LIMMER
Pseudoword	cue	BUIST
Pseudoword	loom	WILK
Pseudoword	rower	JELS

LDT Dutch-English language pair

Category	Prime	Target	Category	Prime	Target
Cognate3	pinguïn	PENGUIN	Pseudoword	abdij	KEST
Cognate3	concert	CONCERT	Pseudoword	afdak	DISE
Cognate3	klok	CLOCK	Pseudoword	adder	KEUTH
Cognate3	ijs	ICE	Pseudoword	hamer	MORK
Cognate3	kasteel	CASTLE	Pseudoword	heup	DAICE
Cognate3	koffie	COFFEE	Pseudoword	boef	CHERP
Cognate3	radio	RADIO	Pseudoword	buis	MATIST
Cognate3	vloer	FLOOR	Pseudoword	pauw	GIENE
Cognate3	bed	BED	Pseudoword	nagel	CIQUE
Cognate3	deur	DOOR	Pseudoword	spons	KOULE
Cognate2	haai	SHARK	Pseudoword	kurk	YAGUE
Cognate2	zeehond	SEAL	Pseudoword	kraan	HARY
Cognate2	leer	LEATHER	Pseudoword	zeef	PLOOM
Cognate2	mens	HUMAN	Pseudoword	banaan	RYPT
Cognate2	borst	CHEST	Pseudoword	koek	COQUE
Cognate2	buurman	NEIGHBOUR	Pseudoword	lijm	KULAR
Cognate2	laken	SHEET	Pseudoword	schep	FOURD
Cognate2	vogel	BIRD	Pseudoword	veter	DISM
Cognate2	speler	PLAYER	Pseudoword	vogel	SKARD
Cognate2	brief	LETTER	Pseudoword	bever	GHAL
Semantic	stier	BULL	Pseudoword	ezel	JAUGH
Semantic	tandarts	DENTIST	Pseudoword	friet	PLINE
Semantic	opa	GRANDPA	Pseudoword	hemd	NEGAL
Semantic	tand	TOOTH	Pseudoword	kachel	YAIS
Semantic	raam	WINDOW	Pseudoword	kiwi	PIEVE
Unrelated	dag	TRICK	Pseudoword	leeuw	BRYNE
Unrelated	nicht	CHEQUE	Pseudoword	piraat	YAUL
Unrelated	hanger	CHAMBER	Pseudoword	scheur	SIRT
Unrelated	aal	MILK	Pseudoword	blouse	NUICE
Unrelated	vork	NECK	Pseudoword	tang	DWISH
Unrelated	tomaat	TRAIN	Pseudoword	bril	TWILD
Unrelated	kelder	STONE	Pseudoword	baan	WRUCK
Unrelated	rok	DOCTOR	Pseudoword	proef	NITY
Unrelated	haan	STAFF	Pseudoword	sap	RHOU
Unrelated	bas	HOUSE	Pseudoword	teek	WHIRT
Unrelated	erker	SAUSAGE	Pseudoword	cirkel	EDDAR
Unrelated	perzik	TIMBER	Pseudoword	aster	PHONT
Unrelated	oester	BOWL	Pseudoword	eland	MAWL
Unrelated	lokaal	CHEEK	Pseudoword	godin	OVEAL
Unrelated	deuk	NOVEL	Pseudoword	koepel	FAICE
Unrelated	beek	SCREEN	Pseudoword	poeder	STUY
Unrelated	marmer	BAG	Pseudoword	koren	STUDE
Unrelated	baal	HUSBAND	Pseudoword	deel	SLURD
Unrelated	kopje	PARENT	Pseudoword	jonker	ENIL
Unrelated	paraaf	EYE	Pseudoword	vracht	FORECT
Unrelated	hymne	RAIN	Pseudoword	stroop	SPAUN
Unrelated	steek	QUEUE	Pseudoword	orgel	KIEZE
Unrelated	nectar	SHADE	Pseudoword	fluit	MOTRY
Unrelated	kolom	CLOTHES	Pseudoword	luis	FEAF
Unrelated	nest	ROAD	Pseudoword	gids	FRAVE

LDT English-Dutch language pair

Category	Prime	Target	Category	Prime	Target
Cognate3	claw	KLAUW	Pseudoword	whale	KROOK
Cognate3	cow	KOE	Pseudoword	herb	LART
Cognate3	bath	BAD	Pseudoword	cook	TEP
Cognate3	bishop	BISSCHOP	Pseudoword	porch	LIEK
Cognate3	winner	WINNAAR	Pseudoword	doll	BLEET
Cognate3	football	VOETBAL	Pseudoword	yard	NAAP
Cognate3	finger	VINGER	Pseudoword	crest	KLEIP
Cognate3	hall	HAL	Pseudoword	rice	KLEK
Cognate3	son	ZOON	Pseudoword	beak	BIEK
Cognate3	person	PERSOON	Pseudoword	frog	SPIP
Cognate2	hump	BULT	Pseudoword	cane	BREEP
Cognate2	pencil	POTLOOD	Pseudoword	bucket	SPEP
Cognate2	coin	MUNT	Pseudoword	helmet	BENK
Cognate2	airport	VLIEGVELD	Pseudoword	missal	WUK
Cognate2	suit	PAK	Pseudoword	match	VRUNT
Cognate2	beach	STRAND	Pseudoword	model	GLAAT
Cognate2	plate	BORD	Pseudoword	nanny	FIRT
Cognate2	stock	VOORRAAD	Pseudoword	peach	KRUP
Cognate2	village	DORP	Pseudoword	perch	PAAG
Cognate2	boy	JONGEN	Pseudoword	piano	DET
Semantic	wheat	TARWE	Pseudoword	penny	TUP
Semantic	dirt	VUIL	Pseudoword	basin	JOFU
Semantic	eagle	ADELAAR	Pseudoword	batch	AGEM
Semantic	tool	GEREEDSCHAP	Pseudoword	chess	VEEK
Semantic	church	KERK	Pseudoword	swivel	PEUM
Unrelated	abroad	PEN	Pseudoword	clerk	PLINK
Unrelated	autumn	STOOM	Pseudoword	snail	PONK
Unrelated	bite	ACTEUR	Pseudoword	roast	SNIEP
Unrelated	claim	NEUS	Pseudoword	jelly	GUK
Unrelated	common	WAPEN	Pseudoword	haunt	WURE
Unrelated	cheer	SCHOUDER	Pseudoword	attic	BORK
Unrelated	dull	RIVIER	Pseudoword	whirl	GAAK
Unrelated	fact	HAAR	Pseudoword	brawl	STROK
Unrelated	fond	TAFEL	Pseudoword	braid	STRUMP
Unrelated	judge	NUMMER	Pseudoword	trust	BIRK
Unrelated	state	WORTEL	Pseudoword	twang	WUUT
Unrelated	paper	BLIK	Pseudoword	press	GIP
Unrelated	plant	SCHELP	Pseudoword	scrap	TESK
Unrelated	drink	BRUILOFT	Pseudoword	skate	STIMP
Unrelated	craft	SPIEGEL	Pseudoword	snack	SPRENT
Unrelated	drift	HERSENS	Pseudoword	front	SLEK
Unrelated	dress	BLOEM	Pseudoword	larch	KNESP
Unrelated	grill	BROER	Pseudoword	hatch	BLASK
Unrelated	plank	LERAAR	Pseudoword	chime	PRAAK
Unrelated	scalp	LID	Pseudoword	easel	TEIK
Unrelated	brush	ZOUT	Pseudoword	queen	BUP
Unrelated	quilt	VACHT	Pseudoword	spray	PLIK
Unrelated	beast	VEZEL	Pseudoword	motel	VROUT
Unrelated	brace	BODEM	Pseudoword	flash	RELK
Unrelated	feast	MEISJE	Pseudoword	belly	FOT

WNT Frisian-English language pair

Category	Prime	Target
Cognate3	huning	HONEY
Cognate3	stoarm	STORM
Cognate3	gitaar	GUITAR
Cognate3	priis	PRIZE
Cognate3	kroan	CROWN
Cognate3	ekspert	EXPERT
Cognate3	tekst	TEXT
Cognate3	masine	MACHINE
Cognate3	fjild	FIELD
Cognate3	rapport	REPORT
Cognate2	klûske	LOCKER
Cognate2	taksy	CAB
Cognate2	planke	SHELF
Cognate2	gerdyn	CURTAIN
Cognate2	trep	STAIRS
Cognate2	trien	TEAR
Cognate2	hout	WOOD
Cognate2	sus	SISTER
Cognate2	beam	TREE
Cognate2	kantoar	OFFICE
Semantic	snie	SNOW
Semantic	delling	VALLEY
Semantic	heit	FATHER
Semantic	baarch	PIG
Semantic	bûse	POCKET
Unrelated	sjippe	LUNG
Unrelated	frucht	TONGUE
Unrelated	skjirre	PIPE
Unrelated	keizel	PLASTIC
Unrelated	aapke	GUEST
Unrelated	kanne	ARTIST
Unrelated	sûpe	FISH
Unrelated	sebra	LIST
Unrelated	falk	STUDENT
Unrelated	gûne	WORD
Unrelated	sop	THUNDER
Unrelated	kjers	RABBIT
Unrelated	moal	SQUAD
Unrelated	keat	DUKE
Unrelated	waarle	STRING
Unrelated	beuker	BORDER
Unrelated	dong	FARMER
Unrelated	drek	SEAT
Unrelated	baalje	WALL
Unrelated	bile	POWER
Unrelated	eart	MILL
Unrelated	fûst	OIL
Unrelated	hage	FRIEND
Unrelated	jirpel	CHICKEN
Unrelated	pearel	CHANNEL

WNT English-Frisian language pair

Category	Prime	Target
Cognate3	spider	SPIN
Cognate3	stick	STÔK
Cognate3	priest	PRYSTER
Cognate3	rose	ROAS
Cognate3	coal	KOAL
Cognate3	ship	SKIP
Cognate3	star	STJER
Cognate3	cell	SEL
Cognate3	pound	PÛN
Cognate3	line	LINE
Cognate2	haircut	KAPSEL
Cognate2	ruler	LINIAAL
Cognate2	cap	PET
Cognate2	aunt	TANTE
Cognate2	hat	HOED
Cognate2	desk	BURO
Cognate2	traffic	FERKEAR
Cognate2	weight	GEWICHT
Cognate2	garden	TÚN
Cognate2	town	STÊD
Semantic	pause	SKOFT
Semantic	toilet	HÚSKE
Semantic	knee	KNIBBEL
Semantic	partner	MAAT
Semantic	month	MOANNE
Unrelated	lap	SWURD
Unrelated	comic	PÔT
Unrelated	lawn	TOERIST
Unrelated	war	LES
Unrelated	court	EAR
Unrelated	ward	GAS
Unrelated	nerve	KLANT
Unrelated	brick	FJOER
Unrelated	poetry	TIIM
Unrelated	dish	HÂN
Unrelated	diary	WELP
Unrelated	hero	NEEF
Unrelated	sink	REEK
Unrelated	iron	KIEL
Unrelated	wage	JAS
Unrelated	entry	KAART
Unrelated	chip	HÛD
Unrelated	zone	DOAS
Unrelated	holder	ARBEIDER
Unrelated	taw	THÚS
Unrelated	shed	TÚT
Unrelated	axe	BÔLE
Unrelated	char	KLOFT
Unrelated	cue	MEM
Unrelated	rower	SKOALLE

WNT Dutch-English language pair

Category	Prime	Target
Cognate3	bij	BEE
Cognate3	lift	LIFT
Cognate3	stroom	STREAM
Cognate3	kamp	CAMP
Cognate3	kat	CAT
Cognate3	goud	GOLD
Cognate3	spreker	SPEAKER
Cognate3	hotel	HOTEL
Cognate3	voet	FOOT
Cognate3	water	WATER
Cognate2	sla	LETTUCE
Cognate2	douche	SHOWER
Cognate2	riem	BELT
Cognate2	afdruk	PRINT
Cognate2	haven	PORT
Cognate2	blad	LEAF
Cognate2	berg	MOUNTAIN
Cognate2	stoel	CHAIR
Cognate2	winkel	SHOP
Cognate2	auto	CAR
Semantic	kaas	CHEESE
Semantic	bes	BERRY
Semantic	oma	GRANDMA
Semantic	room	CREAM
Semantic	paard	HORSE
Unrelated	afdak	MASK
Unrelated	boef	MOUSE
Unrelated	pauw	APPLE
Unrelated	spons	PILOT
Unrelated	kraan	CAPTAIN
Unrelated	banaan	FIG
Unrelated	lijm	BLOOD
Unrelated	veter	SEA
Unrelated	bever	GROUND
Unrelated	friet	BOOK
Unrelated	kachel	SWEATER
Unrelated	leeuw	DUCK
Unrelated	scheur	MOVIE
Unrelated	tang	DISK
Unrelated	baan	FRAME
Unrelated	sap	PUB
Unrelated	cirkel	ENGINE
Unrelated	eland	GOAL
Unrelated	koepel	TEST
Unrelated	hamer	MONEY
Unrelated	koren	KEY
Unrelated	jonker	ONION
Unrelated	stroop	CROP
Unrelated	fluit	LEG
Unrelated	gids	CHILD

WNT English-Dutch language pair

Category	Prime	Target
Cognate3	costume	KOSTUUM
Cognate3	bell	BEL
Cognate3	sand	ZAND
Cognate3	tower	TOREN
Cognate3	soldier	SOLDAAT
Cognate3	boat	BOOT
Cognate3	bar	BAR
Cognate3	station	STATION
Cognate3	arm	ARM
Cognate3	study	STUDIE
Cognate2	dishes	AFWAS
Cognate2	pet	HUISDIER
Cognate2	pit	KUIL
Cognate2	knife	MES
Cognate2	poem	GEDICHT
Cognate2	chain	KETTING
Cognate2	song	LIEDJE
Cognate2	earth	AARDE
Cognate2	piece	STUK
Cognate2	face	GEZICHT
Semantic	widow	WEDUWE
Semantic	sweet	SNOEPJE
Semantic	basket	MANDJE
Semantic	bone	BOT
Semantic	sir	MENEER
Unrelated	whale	BOON
Unrelated	cook	TENNIS
Unrelated	doll	DANS
Unrelated	crest	GRAS
Unrelated	beak	BLOK
Unrelated	cane	AGENT
Unrelated	helmet	EILAND
Unrelated	match	STAP
Unrelated	nanny	PRODUCT
Unrelated	perch	NACHT
Unrelated	penny	POOT
Unrelated	batch	MODDER
Unrelated	swivel	CIJFER
Unrelated	snail	GETUIGE
Unrelated	jelly	LAARS
Unrelated	attic	MEER
Unrelated	brawl	SCHRIJVER
Unrelated	trust	LEERLING
Unrelated	press	KONING
Unrelated	skate	LICHAAM
Unrelated	front	MAALTIJD
Unrelated	hatch	SCHEDEL
Unrelated	easel	MINNAAR
Unrelated	spray	PAPA
Unrelated	flash	WERELD

Summary

This dissertation was based on two claims, namely that bilinguals have an advantage acquiring English as an L3 compared to monolinguals (Lasagabaster, 1997; Cenoz, 1991) and that typology plays a role in successful L3 development (Cenoz, 2003). Trilingual language acquisition is claimed to differ from bilingual language acquisition on several aspects as bilinguals are more experienced language learners (since they already know two languages) and have access to two linguistic systems (Cenoz, Hufeisen & Jessner, 2001; Herdina & Jessner, 2002). Typology plays a role in L3 acquisition in that a typologically closely related L1 or L2 positively influences L3 acquisition more than a typologically more distant L1 or L2 (Cenoz, 2001).

The main aim of this dissertation was to explore the impact of degree of bilingualism on L3 development in three closely related West-Germanic languages: Frisian, Dutch and English. In this dissertation, degree of bilingualism was categorically defined by a differentiation between early Frisian-Dutch bilinguals (EB) and later Dutch-Frisian bilinguals (LB). The main research question addressed was:

Does degree of bilingualism impact third language development in three closely related West-Germanic languages: Frisian, Dutch and English?

As earlier studies on trilingualism have shown, L3 development can be studied in many ways and from many different perspectives (e.g. Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Brohy, 2001; Safont, 2005). From these studies, it has become clear that not only L1 plays a role in the success of L3 development but also L2, gender, SES, language exposure and attitudes and motivation towards languages and language learning. However, most studies study the influence of bilingualism on L3 development from one perspective: the differentiation between monolinguals and bilinguals and measured at one point in time. This dissertation took a different and much broader approach. First of all, the current study distinguishes itself from earlier studies in that it looked at three typologically very closely related languages. Secondly, to come to a good understanding of what factors impact L3 development in the Frisian context, the current study concentrated on three relevant points of focus of L3 development: socio-psychological factors, oral language proficiency and lexical access. Data-collection consisted of three measurements in one school year in which 77 EB (N=34) and LB (N=43) young adolescents participated. Results were analysed using chi-squares and multilevel regression models.

For the socio-psychological focus point of the study background questionnaires were used to see whether EB and LB differ in the amount of language contact and in attitudes and motivation towards languages and language learning (chapter 4). Main differences that were found between EB and LB were that EB are more exposed to Frisian and LB are more exposed to English. Furthermore, EB are more positive towards Frisian and LB are more positive towards English.

For the oral language proficiency focus point of the study questionnaires on self-assessment of language proficiency, EFL (English Foreign Language) vocabulary tests and picture story tasks in the three languages were used to describe possible differences in (oral) language proficiency (chapter 5). Results showed that EB feel more confident about their Frisian language skills whereas LB feel more confident about their Dutch and English language skills. There were no differences between the two groups on the EFL vocabulary test. Results of the picture story task did show differences. LB have more disfluencies and make more use of lexical fluency strategies in Frisian compared to EB. The results also showed that EB make more use of lexical fluency strategies and have a lower lexical diversity in English compared to LB.

For the lexical access focus point of the study a Lexical Decision Task (LDT) and a Word Naming Task (WNT) were used to study participants' accuracy and speed of lexical access in word recognition testing the Bilingual Interactive Activation Plus model (BIA+) for word recognition by Dijkstra and van Heuven (2002) (chapter 6). These two tasks were conducted in the following language pairs: Frisian-English, English-Frisian, Dutch-English and English-Dutch and consisted of different prime-target pairs (cognate, non-cognate, unrelated and pseudo-word). Results showed that EB have higher accuracy scores on the LDT with Frisian target and faster reaction times on Frisian targets in the LDT and WNT compared to LB. LB have higher accuracy scores on the LDT with English targets and faster reaction times on English targets in the LDT (with Frisian prime) and WNT (with Dutch prime).

Compared to LB, EB are less exposed to English, rate their English proficiency lower, are orally less proficient in English and have lower accuracy scores and slower reaction times for English targets in some language pairs of the LDT and WNT. From this it seems that LB are better English language learners. However, development over time showed that some of these initial differences disappear as the school year progresses and EB show bigger progress in some of the measures (e.g. self-assessment of English reading and writing, decreasing number of repetitions and transfers in English picture story task) implying that they are faster English language learners.

What has become clear from this dissertation's results is that early bilingualism in the Frisian context is not an asset nor an obstacle in L3 English development. If the (higher) degree of bilingualism is not the best predictor of successful L3 English language development, then what is? This dissertation shows that there are many factors, besides the degree of bilingualism, that play a role in L3 development. For example, gender, language contact, attitudes and motivation towards language learning and self-assessment of language proficiency all influence and contribute to L3 English development. This dissertation also demonstrates that when looking at different points of focus of L3 development, different and sometimes contrasting results are found. For example, no clear improvement of English oral proficiency is found, but still the accuracy and speed for the LDT and WNT did improve, suggesting a higher English proficiency. Furthermore, this dissertation shows that L3 development in the Frisian context is rather unique and contrasting results are found compared to other studies in the different fields that studied different language combinations and took place in different contexts. The Frisian situation is unique for several reasons. First of all, there is the close relationship between the languages. In contrast to what was expected in this dissertation, this close relationship seems to be more of a disadvantage than an advantage. This for example shows in the reaction times of EB whenever Frisian is involved as a target or prime, which inhibits rather than facilitates EB's reaction times. Secondly, there is the large amount of exposure to English, through television and the Internet, but also through parents. The results show that compared to EB, LB are more exposed to English through their parents. Thirdly, language attitude and motivation towards languages and language learning are different than in other similar studies. LB feel more confident about their English language skills than EB. Together these reasons point to LB being better English language learners than EB. However, EB seem to be faster English language learners.

Samenvatting

Deze dissertatie werd gebaseerd op twee claims: namelijk dat tweetaligen een voordeel hebben bij de ontwikkeling van het Engels als T3 in vergelijking met eentaligen (Lasagabaster, 1997; Cenoz, 1991) en dat typologie een rol speelt in succesvolle T3-ontwikkeling (Cenoz, 2003). Drietalige taalontwikkeling wordt op verschillende aspecten als verschillend gezien van tweetalige taalontwikkeling omdat tweetaligen meer ervaren taalleerders zijn (omdat ze al twee talen beheersen) en toegang hebben tot twee linguïstische systemen (Cenoz, Hufeisen & Jessner, 2001; Herdina & Jessner, 2002). Typologie speelt een rol in T3-ontwikkeling in de zin dat een typologisch verwante T1 of T2 een positievere invloed heeft op de T3-ontwikkeling dan een minder verwante T1 of T2 (Cenoz, 2001).

Het hoofddoel van deze dissertatie was om de impact van mate van tweetaligheid op de T3-ontwikkeling in drie nauwverwante West-Germaanse talen: Fries, Nederlands en Engels te onderzoeken. De mate van tweetaligheid werd gedefinieerd als een categorisch onderscheid tussen vroege Fries-Nederlandse tweetaligen (EB) en latere Nederlands-Friese tweetaligen (LB). De hoofdonderzoeksvraag was:

Heeft de mate van tweetaligheid impact op de derde taalverwerving in drie nauwverwante West-Germaanse talen: Fries, Nederlands en Engels?

Zoals eerdere studies naar drietaligheid lieten zien, kan T3-ontwikkeling op verschillende wijzen en vanuit vele perspectieven bestudeerd worden (bijv. Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Brohy, 2001; Safont, 2005). Uit deze eerdere onderzoeken is naar voren gekomen dat niet alleen T1 een rol speelt in succesvolle T3-ontwikkeling maar ook T2, geslacht, SES, taalblootstelling en attitudes en motivatie tegenover talen en taalleren. Echter bestuderen deze studies de impact van tweetaligheid op T3-ontwikkeling vanuit één perspectief: het onderscheid tussen eentaligen en tweetaligen en meten ze op één moment. Deze dissertatie nam een andere en veel bredere aanpak. Allereerst onderscheid deze studie zich van eerdere studies doordat het naar drie typologisch nauwverwante talen keek. Ten tweede, om een goed begrip te krijgen van de verschillende factoren die T3-ontwikkeling in de Friese context beïnvloeden, concentreerde de studie zich op drie voor T3-ontwikkeling relevante punten: socio-psychologische factoren, mondelinge taalvaardigheid en lexicale toegang. De datacollectie bestond uit drie meetmomenten in één schooljaar waar 77 EB (N=34) en LB (N=43) jongvolwassenen aan meededen. De resultaten werden geanalyseerd met behulp van chi-squares en multilevel regressie modellen.

Voor het socio-psychologische factoren focuspunt van de studie werd een achtergrondvragenlijst gebruikt om te meten of EB en LB verschilden in hun mate van taalcontact en in hun attitude en motivatie tegenover talen en taalleren (hoofdstuk 4). De hoofdverschillen die gevonden werden tussen EB en LB waren dat EB meer blootgesteld worden aan het Fries en dat LB meer blootgesteld worden aan het Engels. Verder zijn EB positiever tegenover het Fries en LB positiever tegenover het Engels.

Voor het mondelinge taalvaardigheid focuspunt van de studie werden vragenlijsten over zelfbeoordeling van taalvaardigheid, woordenschattoetsen Engels als vreemde taal en verteltaken in de drie talen gebruikt om mogelijke verschillen in (mondelinge) taalvaardigheid te beschrijven (hoofdstuk 5). De resultaten laten zien dat EB zich zelfverzekerder voelen over hun Friese taalvaardigheid terwijl LB zich zelfverzekerder voelen over hun Nederlandse en Engelse taalvaardigheid. Er waren geen verschillen tussen beide groepen voor de Engelse woordenschattoets. De resultaten van de verteltaken lieten wel verschillen zien. LB hebben meer onvloeiendheden en maken meer gebruik van lexicale vloeiendheid strategieën in het Fries in vergelijking met EB. De resultaten lieten ook zien dat EB meer gebruik maken van lexicale vloeiendheid strategieën en een lagere lexicale diversiteit hebben in vergelijking met LB.

Voor het lexicale toegang focuspunt van de studie werden een Lexicale Decisie Taak (LDT) en een Woord Benoem Taak (WNT) gebruikt om de accuraatheid en snelheid van lexicale toegang in woordherkenning van de proefpersonen te meten waarbij de Bilingual Interactive Activation Plus model (BIA+) voor woordherkenning van Dijkstra en van Heuven (2002) getest werd (hoofdstuk 6). Deze twee taken werden uitgevoerd in de volgende taalparen: Fries-Engels, Engels-Fries, Nederlands-Engels, Engels-Nederlands en bestond uit verschillende prime-target relaties (cognaat, non-cognaat, ongerelateerd en pseudowoord). De resultaten lieten zien dat EB een hogere accuraatheid hebben op de LDT met Friese targets en snellere reactietijden voor Friese targets op de LDT en WNT in vergelijking met LB. LB hadden een hogere accuraatheid op de LDT met Engelse targets en snellere reactietijden voor Engelse targets op de LDT (met Friese prime) en WNT (met Nederlandse prime) in vergelijking met EB.

EB zijn, in vergelijking met EB, minder blootgesteld aan het Engels, geven hun Engelse taalvaardigheid een lagere score, zijn minder taalvaardig in het Engels en hebben een lagere accuraatheid en lagere reactietijden op sommige taalparen in de LDT en WNT. Hieruit zou geconcludeerd kunnen worden dat LB betere Engelse taalleerders zijn. Echter laat het verloop over tijd zien dat enkele van de aanvankelijke verschillen tussen de twee groepen in de loop van het schooljaar verdwijnen.

Bovendien laten EB grotere progressie zien in sommige van de metingen (bijv. zelfbeoordeling van Engels lezen en schrijven, afnemend aantal herhalingen en transfers in de Engelse verteltaak) wat impliceert dat zij snellere Engelse taalleerders zijn.

Wat uit de resultaten van deze dissertatie duidelijk wordt, is dat vroege tweetaligheid in de Friese context geen voordeel maar ook geen obstakel vormt voor T3 Engelse taalontwikkeling. Maar als de (hogere) mate van tweetaligheid niet een goede voorspeller van succesvolle T3 Engelse taalontwikkeling is, wat dan wel? Deze dissertatie laat zien dat er vele factoren zijn, naast de mate van tweetaligheid, die een rol spelen in T3-ontwikkeling. Bijvoorbeeld geslacht, taalcontact, attitudes en motivatie tegenover taalleren en zelfbeoordeling van taalvaardigheid spelen allemaal een rol en dragen bij tot de T3 Engelse taalontwikkeling. Deze dissertatie laat ook zien dat wanneer er gekeken wordt naar verschillende focuspunten van T3 taalontwikkeling, verschillende en soms contrasterende resultaten gevonden kunnen worden. Er is bijvoorbeeld geen duidelijke verbetering van de mondelinge taalvaardigheid Engels maar de accuraatheid en snelheid van reactietijden van de LDT en WNT verbeteren wel, wat op een verbeterde taalvaardigheid duidt. Verder toont deze dissertatie aan dat T3-ontwikkeling in de Friese context vrij uniek is en dat contrasterende resultaten gevonden worden in vergelijking met andere studies in de verschillende onderzoeksvelden die naar andere taalcombinaties keken en plaatsvonden in andere contexten. De Friese situatie is uniek om verschillende redenen. Allereerst is er de nauwverwantheid tussen de talen. Maar in tegenstelling tot wat verwacht werd, deed blijken dat deze nauwverwantheid meer een nadeel dan een voordeel was. Dit blijkt bijvoorbeeld duidelijk uit de reactietijden van de EB wanneer Fries als prime of target betrokken werd, welke inhibitie en niet facilitatie van reactietijden veroorzaakte. Ten tweede, is er de grotere taalblootstelling aan het Engels, door televisie en Internet maar ook via ouders. De resultaten laten zien dat in vergelijking met EB, LB meer blootgesteld worden aan het Engels via hun ouders. Ten derde zijn taalattitudes en motivatie tegenover talen en taalleren anders dan in vergelijkbare studies. LB zijn zelfverzekerder over hun Engelse taalvaardigheid dan EB. Samengenomen wijzen deze punten erop dat LB betere Engelse taalleerders zijn. Echter lijken EB snellere Engelse taalleerders te zijn.

Gearfetting

Dizze dissertaasje waard basearre op twa claims: nammentlik dat twataligen in foardiel hawwe by de ûntjouwing fan Ingelsk as in T3 yn ferliking mei ientaligen (Lasagabaster, 1997; Cenoz, 1991) en dat typology in rol spilet yn suksesfolle T3-ûntjouwing (Cenoz, 2003). Trijetalige taalûntjouwing wurdt sjoen as oars as twatalige taalûntjouwing op ferskate aspekten omdat twataligen mear ûnderfining hawwe mei it learen fan talen (omdat se al twa talen behearskje) en tagong hawwe ta twa linguistyske systemen (Cenoz, Hufeisen & Jessner, 2001; Herdina & Jessner, 2002). Typology spilet in rol yn T3-ûntjouwing yn de sin dat in typologysk besibbe T1 of T2 in positivere ynfloed hat op T3-ûntjouwing as in typologysk minder besibbe T1 of T2 (Cenoz, 2001).

De haaddoel fan dizze dissertaasje wie om de ympakt fan de mjitte fan twataligens op T3-ûntjouwing yn trije nau besibbe West-Germaanske talen: Frysk, Nederlânsk en Ingelsk te ûndersykjen. De mjitte fan twataligens waard kategorysk definiearre as it ûnderskied tusken betide Frysk-Nederlânske twataligen (EB) en lettere Nederlânsk-Fryske twataligen (LB). De haad ûndersyksfraach wie:

Hat de mjitte fan twataligens ympakt op de tredde taal ûntjouwing yn trije nau besibbe West-Germaanske talen: Frysk, Nederlânsk en Ingelsk?

Sa as eardere stúdzjes oer trijetaligens sjen litten hawwe, kin T3-ûntjouwing op ferskate wizen en út in soad ferskate perspektiven bestudearre wurde (bygl. Cenoz, 1991; Cenoz & Valencia, 1994; Lasagabaster, 1997; Sanz, 2000; Sagasta, 2001; Brohy, 2001; Safont, 2005). Ut dizze eardere ûndersiken is nei foaren kommen dat net allinnich T1 in rol spilet yn suksesfolle T3-ûntjouwing mar ek T2, geslacht, SES, taalbleatstelling en attitudes en motivaasje tsjinoer talen en taallearen. Lykwols, dizze stúdzjes bestudearren de ympakt fan twataligens op T3-ûntjouwing fanút ien perspektyf: it ûnderskied tusken ientaligen en twataligen en metten op ien momint. Dizze dissertaasje naam in oare en folle bredere oanpak. Alderearst ûnderskied dizze stúdzje himsels fan eardere stúdzjes trochdat der nei trije nau besibbe talen sjoen waard. Twadst, om in goed begryp te krijen fan de ferskate faktoaren dy't T3-ûntjouwing yn de Fryske kontekst beynfloedzje, konsintrearre de stúdzje him op trije relevante punten fan T3-ûntjouwing: sosjo-psychologyske faktoaren, mûnlinge taalfeardigens en leksikale tagong. De data-kolleksje bestie út trije mjitmominten yn ien skoaljier dêr't 77 EB (N=34) en LB (N=43) jongfolwoeksenen oan meidien. De resultaten waarden analysearre mei gebrûk fan chi-squares en multilevel regressjemodellen.

Foar it sosjo-psychologyske faktoaren fokuspunt waard in eftergrûnfragelist brûkt om te sjen oft EB en LB ferskilden yn harren mjitte fan taalkontakt en yn harren attitude en motivaasje tsjinoer talen en taallearen (haadstik 4). De haadferskillen dy't fûn waarden tusken EB en LB wiene dat EB mear bleatsteld wurde oan Frysk en LB mear oan it Ingelsk. Fierder binne EB positiver tsjinoer it Frysk en LB positiver tsjinoer it Ingelsk.

Foar it mûnlinge taalfeardigens fokuspunt waarden fragelisten oer selsbeoardieling fan taalfeardigens, wurdskattoetsen Ingelsk as frjemde taal en ferteltaken yn de trije talen brûkt om mooglike ferskillen yn (mûnlinge) taalfeardigens te beskriuwen (haadstik 5). De resultaten litte sjen dat EB har selsfersekerder fiele oer harren Fryske taalfeardigens wylst LB har selsfersekerder fiele oer harren Nederlânske en Ingelske taalfeardigens. Der wienen gjin ferskillen tusken beide groepen op de Ingelske wurdskattoets. De resultaten fan de ferteltaken lieten wol ferskillen sjen. LB hawwe mear ûnfloeiendheden en meitsje mear gebrûk fan leksikale floeiendheid strategyen yn it Frysk yn ferliking mei EB. De resultaten lieten ek sjen dat EB mear gebrûk meitsje fan leksikale floeiendheid strategyen en in legere leksikale diversiteit yn it Ingelsk hawwe yn ferliking mei LB.

Foar it leksikale tagong fokuspunt waard in Leksikale Beslút Taak (LDT) en in Wurd Beneam Taak (WNT) brûkt om de proefpersoanen har presizens en snelheid fan leksikale tagong yn wurdwerkenning te mjitten. Dêrby waard de Bilingual Interactive Activation Plus model (BIA+) foar wurdwerkenning fan Dijkstra en van Heuven (2002) test (haadstik 6). Dizze twa taken waarden útfierd yn de folgjende taalpearen: Frysk-Ingelsk, Ingelsk-Frysk, Nederlânsk-Ingelsk en Ingelsk-Nederlânsk en bestiene út ferskate prime-target relaasjes (kognaat, net-kognaat, ûnrelatearre en pseudowurd). De resultaten lieten sjen dat EB in hegere presizens hawwe op de LDT mei Fryske targets en fluggere reaksjetiden foar Fryske targets op de LDT en WNT yn ferliking mei LB. LB hawwe in hegere presizens hienen op de LDT mei Ingelske targets en fluggere reaksjetiden foar Ingelske targets op de LDT (mei Fryske prime) en WNT (mei Nederlânske prime) yn ferlyk mei EB.

EB wienen, yn ferliking mei LB, minder bleatsteld oan it Ingelsk, joegen har Ingelske taalfeardigens in legere skoare, wienen net sa taalfeardich yn it Ingelsk en hienen legere presizens en legere reaksjetiden op guon taalpearen yn de LDT en WNT. Hjirút soe konkludearre wurde kinne dat LB bettere Ingelske taallearders binne. Lykwols, it ferrin oer de tiid liet sjen dat guon fan de inisjele ferskillen yn de rin fan it skoaljier ferdwûnen en EB lieten gruttere progresje sjen yn guon fan de mjittingen (bygl. selsbeoardieling fan Ingelsk lêzen en skriuwen, ôfnimmend tal werhellingen en transfers yn de Ingelske ferteltaak) wat ymplisearret dat sy fluggere Ingelske taallearders binne.

Wat út de resultaten fan dizze disserataasje dúdlik waard is dat betide twaligens yn de Fryske kontekst gjin foardiel hat,mar ek gjin obstakel is yn T3 Ingelske taalûntjouwing. Mar as de (hegere) mjitte fan twataligens net in goede foarspeller is fan suksesfolle T3 Ingelske taalûntjouwing is, wat dan wol? Dizze dissertaasje lit sjen dat der in hiele soad faktoaren binne, neist de mjitte fan twataligens, dy't in rol spylje in T3-ûntjouwing. Bygelyks, geslacht, taalkontakt, attitudes en motivaasje tsjinoer taallearen en selsbeoardieling fan taalfeardigens spylje allegearre in rol en drage by ta de L3 Ingelske taalûntjouwing. Dizze dissertaasje lit ek sjen dat, wannear't der nei ferskate fokuspunten fan T3-ûntjouwing sjoen wurdt, der ferskillende en somtiids kontrastearjende resultaten fûn wurde kinne. Der wie bygelyks gjin dúdlike ferbettering fan de mûnlinge Ingelske taalfeardigens, mar de presizens en snelheid fan reaksjetiden fan de LDT en WNT ferbetteren al. Dat wiist al op in ferbettere taalfeardingens. Fierder lit dizze dissertaasje sjen dat T3-ûntjouwing yn de Fryske kontekst frij unyk is en dat der kontrastearjende resultaten fûn wurde yn ferliking mei oare stúdzjes yn de ferskate ûndersyksfjilden dy't nei oare taalkombinaasjes seagen en plakhiene yn oare konteksten. De Fryske situaasje is unyk om ferskate redenen. Alderearst is der de nauwe besibbens tusken de talen. Mar yn kontrast mei wat ferwachte waard, die bliken dat dizze nauwe besibbens mear in neidiel as in foardiel wie. Dat waard bygelyks dúdlik út de reaksjetiden fan de EB wannear't Frysk as in prime of target behelle wie, wat ynhibysje en net fasilitaasje fan reaksjetiden feroarsake. Twads is der de grutte taalbleatstelling oan it Ingelsk, troch telefyzje en ynternet mar ek fia âlders. De resultaten litte sjen dat, yn ferliking mei EB, LB mear bleatsteld binne oan it Ingelsk fia harren âlders. Treds, taalattitude en motivaasje tsjinoer talen en taallearen binne oars as yn ferlykbere stúdzjes. LB binne selsfersekerder oer harren Ingelske taalfeardigens as EB. Tegearre wize dizze punten derop dat LB bettere Ingelske taallearders binne. Lykwols, EB lykje fluggere Ingelske taallearders te wêzen.

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