

# **The development of Dutch and English language proficiency in students of Dutch bilingual secondary schools.**

Evidence from the Peabody Picture Vocabulary Test and the Oxford Placement Test.

Annelies van der Lee  
s4530241

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Radboud University Nijmegen

Supervisor: Dr. Roeland van Hout  
Second reader: Claire Goriot

## Foreword

Finishing this thesis marks the end of my time as a student; though do we not all stay students for the rest of our lives? Anyway, 9.5 years after my high school graduation here it is, my master's thesis. I am grateful for these years of learning, both within and outside the classroom. In the past years I have explored the scientific world from one corner to the other, and I think I have found my corner of that world in linguistics.

This thesis was the last hurdle, and sometimes it felt like the darkest hour before dawn (don't theses always). But most of the time it was definitely an interesting and instructive experience. I want to thank Dr. van der Laan-Lobo and her team at Varendonck College for the data they collected over the past three years and for the useful advice. For advice and assistance throughout the process, especially the data analysis, I want to thank my thesis supervisor, Dr. van Hout.

I am thankful for the many learning opportunities over the years and for the people who have guided, prodded, pulled, and supported me through them. You know who you are. Thank you for your wisdom, your support, your pushing and prodding, and for the mid-term celebrations. Now let's celebrate!

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## Abstract

Previous research has shown that in the first three years of secondary school, students following a bilingual education program reach a higher level of English than their peers who follow a mainstream education program. In this research project, students from all years of secondary school have been tested on both their Dutch and English language proficiency.

This study was conducted at Varendonck College in Asten, the Netherlands, a secondary school offering both bilingual and mainstream monolingual education on the pre-university (VWO) level. Students were tested yearly over the course of three years, 2014-2017. The Peabody Picture Vocabulary Test (English and Dutch) and the Oxford Placement Test (English) were used to test students' language proficiency. In addition to these language tests, students' CITO scores and final exam results for Dutch, English and Mathematics were collected. Teachers from the bilingual program were tested as well.

The main research question of this thesis is: How do the Dutch and English language proficiency of students in bilingual and mainstream monolingual routes of a Dutch secondary school develop over time, as measured by the Peabody Picture Vocabulary Test and the Oxford Placement Test? For the analysis, we studied the data from three perspectives: all data, longitudinal data from participants who were tested multiple times, and exam year data from participants who were tested in their final year of secondary school.

The main findings of this study can be summarized as follows. First, both the monolingual and bilingual groups progress in their English language learning, with the students following bilingual education reaching a higher level of English. This difference is seen starting from the first school year, stays consistent in all six school years, and can be observed in their English final exams. Second, we can conclude that following a Dutch-English education did not negatively affect the participants' Dutch language proficiency nor their exam results in Mathematics. When correcting for CITO score, bilingual students score on the same level as monolingual students for the PPVT-NL and their Dutch and Mathematics final exams.

# 1. Introduction

The English language is becoming more and more common to Dutch everyday life. Radio stations play English music, Hollywood movies are only dubbed for children, university students read English study books, and on social media English and Dutch are used side by side. The Netherlands is one of the countries with the highest non-native speaker English language proficiency in the world (Rys et al., 2017). It is therefore not surprising that many schools offer extra English classes or Dutch-English bilingual education programs. In fact, Dutch-English bilingual education is up and coming in the Dutch education system, with more and more primary and secondary schools introducing bilingual education programs or offering English lessons at an earlier age (de Graaff, 2015). At first, bilingual education was only offered for students following the pre-university secondary school program (VWO), but an increasing number of schools are adding bilingual education routes for other levels (Dutch secondary education is divided into three levels) (Nuffic, 2017a). Many of these schools use the CLIL method, an immersion method that includes offering various school subjects in English, so that students learn to use English in everyday settings (European Commission, 2017).

In general, bilingual education in the Netherlands is seen as a success story (European Platform, 2013). A number of research projects have been conducted on bilingual education, mostly on the effect of bilingual education on students' English language proficiency. These projects show that a Dutch-English bilingual education is advantageous for students' English language proficiency, with students in bilingual education learning English faster than their peers in mainstream education. These results will be discussed in more detail further on in this thesis.

However, little research has been conducted on the effect of a Dutch-English education on students' Dutch language development and proficiency or on their progress in other school subjects. At the moment there are a number of research and pilot programs concerned with bilingual education in primary schools (Rijksoverheid, n.d.b). Bilingual education programs in secondary schools, however, are considered to be more established and receive less attention from researchers. There is still much to learn about the quality and effectiveness of bilingual education and its effect on the Dutch and English language development of students. The research project that this thesis is part of seeks to begin to fill this gap.

By studying both the Dutch and the English language development of students over time, we hope to gain insight into the effect of a bilingual education on students' proficiency in both languages. To measure the students' language development we have chosen to use two language tests that are not part of the school curriculum: the Peabody Picture Vocabulary Test (PPVT) and the Oxford Placement Test (OPT). The PPVT will be administered for both English and Dutch, while the OPT tests English proficiency. Together these tests give an impression of students' language proficiency regarding vocabulary, grammar, understanding and language use, as will be further explained in Chapter 3. Using tests that are not part of the school curriculum will give a more objective view of the students' development. Factors such as pronunciation and the fluency of spontaneous speech are factors that may distinguish students in bilingual education from those in mainstream education, as students in bilingual education have more practice in everyday settings. However, within the scope of this study it was not possible to include all language factors in the analysis of the students' language proficiency. The main research question of this thesis is therefore: How do the Dutch and

English language proficiency of students in bilingual and mainstream monolingual routes of a Dutch secondary school develop over time, as measured by the Peabody Picture Vocabulary Test and the Oxford Placement Test?

In addition to studying the language development using the Peabody Picture Vocabulary Test and the Oxford Placement Test, we will consider a number of related factors, namely the students' CITO score and their end-of-school exam results for Dutch, English, and Mathematics. The CITO score is included because it is an important factor in admission to the bilingual education route. These factors will be further explained in Chapter 3. We have studied the first and second language development of secondary students following a Dutch-English bilingual education route, as well as students following a mainstream monolingual education route, in which they do receive (English) foreign language lessons.

The participants' language development was recorded over the course of three years using the Peabody Picture Vocabulary Test (Dutch and English) and the Oxford Placement Test. The data was collected at Varendonck College, a secondary school in Asten, in the south of the Netherlands. The data collected for this thesis is part of a larger research project at Varendonck College, in which data on students' motivation for and attitude towards bilingual education was collected as well. However, including this data in addition to the data analyzed would exceed the scope of this master thesis, so it was not included.

Chapter 2 of this thesis discusses the current situation concerning bilingual education in the Netherlands, including some theoretical background, as well as research that has already been conducted on the subject. For the analysis we approached the data from three different perspectives: all data, longitudinal data from participants who were tested more than once, and exam year data including all measurements from students in their final year of secondary school. The methods of data collection and data analysis are described in more detail in Chapter 3. The results are laid out in Chapter 4, with a discussion of the results and our conclusions following in Chapter 5.

## 2. Theoretical Background

### 2.1 Bilingualism

Before studying bilingual education, we first need to define what bilingualism is. In this thesis I will use the term 'bilingual(ism)' for people who speak more than one language, whether it be two or more, because the subject of study is bilingual education. Baker (2006) has written extensively on the subject in his book *Foundations of Bilingual Education and Bilingualism*. He describes two main kinds of bilingualism: individual and societal, with the latter concerning groups, societies, and countries where two or more languages are routinely used. In the case of societal bilingualism, the dual language learning usually begins at a young age and through a more natural language learning process. Individual bilingualism is often, though not always, a case of 'elective bilingualism', where the individual makes the choice to learn a new language in a classroom or other more educational setting.

Bilingualism can be described using four basic language abilities: listening, speaking, reading, and writing (Baker, 2006). In other words: receptive and productive oracy and literacy. However, bilingualism is hard to classify. Each bilingual's ability in each of these four categories is different, both in comparison with other speakers and for each of the languages they speak. For example, one person may have well-developed listening skills but hardly any writing skills in one language, and have the opposite for another language (s)he speaks. For each of the languages they speak, bilinguals find themselves on a continuum of skill level, and this is most likely different for each language. In most cases, bilingual speakers will use their different languages in different situations, which influences their knowledge of and skill in that language. A child may, for example, use one language at home and another language at school. This will result in them knowing a certain set of words in the home language and another, more school-focused, set of words in the school language.

Acquiring bilingualism can take place in a number of different ways, depending on the context in which the languages are learned. Two ways in which a person can become bilingual are simultaneous and successive bilingualism (Gass, 2013). In simultaneous acquisition the two languages are learned at the same time, which usually happens when children grow up in a bilingual setting. Successive acquisition takes place when a person first acquires one language and then later acquires a second language. This is often achieved through formal second language learning in schools, language classes, etc. Bilingual education falls into this last category. As most Dutch children start learning English in school, they are successive bilinguals (except in cases where they speak English or another language at home).

There are various reasons for people to learn a second language, which can be categorized as societal or individual reasons. Societal reasons include immigration, economy & trade, access to information, intercultural communication, and the existence of minority languages in your society. Individual reasons include pursuit of cognitive development, pursuit of cultural awareness, career & employment, and affective goals such as social or moral reasons (Baker, 2006).

Two ways to view bilingual people are the fractional view and the holistic view (Baker, 2006). The fractional view consists of the idea that a bilingual person is basically two monolinguals in one person, with two separate sets of language skills. This view is also called the monolingual view. It considers bilinguals from a monolingual viewpoint, and therefore compares their language skills with those of monolingual speakers of that language. The second point of view



is the holistic view, in which the bilingual is seen as having one unique linguistic profile that combines all the languages the person knows. It also takes into account the fact that bilinguals use their different languages in different contexts. Therefore, from a holistic point of view it is not really possible to compare a bilingual's language ability with that of monolingual users of that language. The holistic view also holds that when assessing language skill, the assessment should be sensitive to the contextual differences (in which languages are used in different contexts) and should mainly focus on general communicative competence. In this current research project, we will compare students following Dutch-English bilingual education with students following regular Dutch monolingual education with English foreign language classes. In some ways this is taking a fractional point of view, but because both groups are second language learners (to a different extent), we are not comparing bilinguals to monolinguals but two groups of bilinguals, which is a more holistic approach.

## **2.2 Bilingual education: Content and Language Integrated Learning**

The approach to bilingual education that is used in almost all bilingual schools in Europe, including the Netherlands, is Content and Language Integrated Learning, or CLIL. CLIL is a term that is often used for different types of bilingual immersion education, but is actually a specific approach, that can be practiced in different degrees. The basis of CLIL is immersion education, in which normal school subjects are taught in the target language (for example teaching Mathematics in English, in a Dutch school offering a Dutch-English education). CLIL can be implemented in two ways: “‘total’ if the entire curriculum is taught in what is termed the target language, or ‘partial’ if that language is the language of instruction for just some subjects” (Eurydice, 2006, p.7). This second, partial, approach is the one that is most often used in European bilingual schools, with the number and choice of subjects taught in the target language varying per region and school. The second language offered in the bilingual program may be a second official language, a regional language, or a foreign language. Schools often choose for CLIL because, among other reasons, it gives students a chance to improve proficiency and it meets the demand of immigrant and dual nationality families (European Commission, 2017; Eurydice, 2006).

One advantage of CLIL is that it helps to teach the target language without taking too much time in the curriculum for the language subject. Additionally, it enables learners to “be exposed to a situation calling for genuine communication” (Eurydice, 2006, p.8), as they learn to use the language in everyday settings and do not just learn about the language and its rules.

There are a number of obstacles to implementing CLIL in schools, as well as points that are under debate. Implementing CLIL requires specially trained teachers as well as special teaching materials. Both these factors bring extra costs with them, and there is often a shortage of CLIL-qualified teachers. There is discussion about which school subjects should be chosen to be taught in the target language, in which the central question is whether CLIL is suitable for all subjects. A question that often arises is whether CLIL, and with it bilingual education in general, should be available for all students or only for a selection of qualified and motivated students. Finally, it is not yet clear what the effect of using CLIL is on the national language, both in terms of language proficiency and in terms of political and social ramifications. A full overview of these points can be found in the 2006 Eurydice report. As the school at which this present study was conducted uses CLIL in its education program, we hope to gain more insight into the effects of using CLIL through this research project. We especially

hope to gain insight in the effect of CLIL on the national language and the other school subjects.

## 2.3 English in the Netherlands

Multilingualism in society brings change, both for good and, arguably, for bad. As described above, bilingualism aids education and intercultural communication. However, it can also endanger language and culture. In places where one language becomes the majority language, minority languages may become endangered or even extinct. According to SIL International, 35% of the 7,099 known living languages are in various stages of endangerment and since 1950 360 languages have become extinct (SIL International, 2017). The spread of majority languages and global languages such as English may discourage societies to maintain their own language. This threatens not only their language but also their culture, as the two are closely intertwined (SIL International, 2017). The challenge is therefore to encourage the use and emphasize the importance of both languages.

In this study we focus on bilingual education in the Netherlands, a country that is officially monolingual for the larger part: the national language is Dutch. One province of the Netherlands, Friesland, has a second official language: Frisian (Nortier, 2009). However, this is not the area where our research takes place. The Netherlands recognizes a number of regional and non-territorial languages: *Limburgs*, *Nedersaksisch*, *Jiddisj*, and *Sinti-Romanes* (Rijksoverheid, n.d.c). *Limburgs* is spoken in the region close to the school where our research has been carried out. However, this is primarily at home or in other informal situations and all children learn to speak Dutch before or during primary school.

As in many other countries, English is becoming more and more prevalent in Dutch society. This is especially seen in the media: the majority of popular films and music are in English, with films being subtitled but not dubbed. English words are used more and more in everyday life, for example in advertising and in social media, and universities offer more and more courses in English. However, in most social domains Dutch remains the dominant language, including newer domains such as social media (Rys et al., 2017).

The overwhelming majority of bilingual secondary schools in the Netherlands offers a Dutch-English curriculum, with only one offering a different language: German. This reflects the status of English, and that of other foreign languages, in the Netherlands. The status of a (foreign) language within a country can be described with the Kachruvian Three Circles framework. The framework consists of three circles: the Inner, Outer, and Expanding Circles (Kachru, 1992). Inner Circle countries are countries where English is the primary language, for example the U.K. and U.S.A. Outer circle countries are countries where English is “one of two or more official or state languages” (Gerritsen, Meurs, Planken & Korzilius, 2016, p.458). These are usually former colonies of England and places where English is *norm developing*, for example India and Pakistan. Finally, Expanding Circle countries are countries where English does not have an official status but instead functions as an international or foreign language, such as China and Russia. According to Gerritsen et al. (2016), the “Outer Circle roughly coincides with ESL and the Expanding Circle with EFL” (p.458), ESL being English as a Second Language and EFL being English as a Foreign Language.

There is some discussion concerning which circle English in the Netherlands should be placed (Nejjari, Gerritsen, Gussenhoven, van Hout & Planken, 2017). Gerritsen et al. (2016) write that English is often considered to be not a foreign language any longer but a second language in the Netherlands, even though it is not an official national language. Some researchers hold

that English in the Netherlands is an Outer Circle English, while others state that it fits better in the Expanding Circle. Others characterize English in the Netherlands as moving from the Expanding Circle to the Outer Circle. Gerritsen et al. (2016) cite Berns (1995), who writes that countries such as the Netherlands, Luxembourg, and Germany are a special category, the Expanding/Outer Circle, because English is “not only a foreign or international language ..., but also serves functions ‘in various social, cultural, commercial, and educational settings’” (p.458).

Gerritsen et al. (2016) use the Kachru three circles model to reconsider the status of English in the Netherlands, choosing this model because it is “one of the few models that offers criteria for classification which are necessary to achieve a degree of analytical rigor” (p.459). Using data from various studies and research projects, they discuss the features the features in Kachru’s model to place English in the Netherlands in the appropriate circle. These features include: English as a code, the role of English in language policy, the spread of English, domains of English and language competences, English nativized literary tradition, and variety with its own norm. Gerritsen et al. (2016) conclude that though English in the Netherlands has a number of characteristics that apply to the Outer Circle, there are “insufficient grounds” (p.470) for classifying English in the Netherlands as Outer Circle. Among other reasons, English in the Netherlands is always used as addition to Dutch, and not on its own. Also, outside of popular music there is no nativized literary tradition. English does not play a “significant role in national governmental communication” either (Nejjari et al., 2017, p.3). The main difference between this study and other studies was the large amount of data that was available for Gerritsen et al.’s (2016) study. Considering the results of their research, the authors do expect that the use of English in the Netherlands will continue to increase in the coming years.

## **2.4 Bilingual education in the Netherlands**

Bilingual education in the Netherlands is seen by many as a success-story, and more and more secondary and primary schools are choosing to offer a bilingual program. The European Platform and the Network of Dutch Bilingual Schools name two main factors that contribute to this success (European Platform, 2013). First, that the initiative to bilingual education comes from within the schools themselves, as opposed to being imposed by the government. Schools also organize the standardization and quality control themselves. Second, that “peer-to-peer coordination and organization” and international orientation are a set part of the curriculum (European Platform, 2013, p.1). Quality control is centrally organized by Nuffic, which sets requirements for bilingual school on aspects such as the language proficiency of teachers, the distribution of bilingual lessons over the different classes, and the central position of internationalization in school policy (Rijksoverheid, n.d.b). Nuffic is a Dutch organization that focuses (among others) on the internationalization of primary and secondary education, in which their goal is that every student gains international experience during his/her school years (Nuffic, 2017c).

Bilingual education can be given at all levels of education, including primary and secondary school. The earlier bilingual education starts, the more simultaneous the language acquisition is. In the Netherlands, all schools offer some English lessons in the final years of primary school. Some schools start foreign language lessons earlier, usually starting from the first year of primary school. They do not offer bilingual education, but do offer regular foreign language lessons in English, French, German or Spanish. At the moment 1,000 primary schools offer this ‘early foreign language education’ (Rijksoverheid, n.d.b). At the moment there is an increase

in primary schools' interest in offering bilingual education, usually Dutch-English, therefore we will briefly discuss bilingual primary education in the following paragraphs. However, the majority of bilingual schools in the Netherlands are still secondary schools and in this research we will focus on bilingual secondary education.

In the Netherlands there is an ongoing national pilot program for bilingual primary education, in which schools may choose to give up to 15% of lessons in a different language. This may be English, French or German, but all participating schools have chosen English. This pilot started in January 2016 and ends in 2019, after which the program will be evaluated (Rijksoverheid, n.d.b). There have been several studies on bilingual primary education in the Netherlands, one of which will briefly be discussed here.

Among the research conducted on bilingual education in Dutch primary schools is Lobo's (2013) research on second language acquisition at a young age. In this research project, children in grade 1 and grade 3 were taught arts and crafts or physical education in English, to study the progress of their L2 vocabulary and pronunciation as well as their interaction with the teacher. The children, teachers and parents were also interviewed on their opinion of the children's learning experiences and L2 learning in primary school. The underlying question of this research was whether earlier is indeed better when it comes to foreign language education. Lobo concludes that starting in grade 1 or grade 3 would both be beneficial to the students' language learning. The current trend in the Netherlands is to discontinue English lessons in grade 3 because children have to focus on learning to read and write at that time. However, this research shows that this is not necessary, and that it is an option to start English language learning in grade 3. In fact, Lobo (2013) mentions, grade 3 may be a better time to start English lessons than grade 1, as the grade 3 participants "produced more utterances and instances of language learning" and were "consistently more positive than their younger counterparts" (p.185).

Due to immigration, more and more children are growing up in a multilingual family setting. How this is viewed by educators differs, often depending on which language and social background the child has, as languages have different statuses. Cornips (2012) describes how some languages such as Dutch and English are 'good' and have a high status, while others such as Dutch dialects, Berber or Swedish have a low status. Someone who speaks Dutch with an English accent is appreciated more than a speaker with a Moroccan accent, so different forms of bilingualism are perceived as problematic or enriching in varying measures (Cornips, 2012, p.38). De Graaff (2015) writes that in bilingual schools in the Netherlands there is little attention for a student's multilingualism if the second language is not English. Teachers do not link the process of bilingual education to the students' home language and their language learning experiences, nor do they look at possible connections between languages.

## **2.5 Bilingual secondary education in the Netherlands**

The Dutch secondary school system is organized into different levels, which lead up to the different levels of undergraduate institutions. Based on their primary school achievements and CITO score, students are placed in preparatory secondary vocational training (VMBO), senior general secondary education (HAVO), or pre-university education (VWO). Students who follow pre-university education (VWO), may choose the *atheneum* route, which is regular VWO, or the *gymnasium* route, which includes classes in Greek and Latin. Some schools offer a special *technasium* class, which offers extra projects with a (technical) scientific focus. In

this paper the Dutch abbreviations VMBO, HAVO and VWO will be used, as well as the terms athenaeum, gymnasium and technasium.

At the end of primary school, most students take the CITO test, a national test on (Dutch) language, Mathematics and optionally 'world orientation'. The test results in a score between 501 and 550, which is an important part of the advice a student receives concerning the level of secondary education they should choose. This advice is based on the CITO score and on the primary school teacher's judgment. The annual CITO test is developed over a period of two years by test experts and primary school teachers (CITO, n.d.a).

In November 2017 132 secondary schools in the Netherlands offered bilingual education, with almost all choosing English as the second language (Nuffic, 2017a). There is one secondary school close to the German border that offers a Dutch-German curriculum (Nortier, 2009; SLO, 2017). In the Netherlands, bilingual education is usually offered at the VWO level (120 schools), but increasingly schools are adding bilingual routes at the HAVO (54 schools) or VMBO (27 schools) level as well (Nuffic, 2017a).

Schools choose to offer a bilingual curriculum to prepare students for the increasingly international society, in which knowledge of Europe, international experiences and language skills are important. In this context, a bilingual education offers both the language and societal education (Nuffic, 2017b). Students often choose to follow a bilingual secondary education because they (or their parents) think it will be useful in their career. Additionally, primary schools offer more and more English, which makes the choice for bilingual secondary education more plausible (European Platform, 2013).

To be able to offer a bilingual education program, schools have to follow strict regulations set by the Dutch government. At least 50% of the lessons must be given in English, the program may not cost too much and the students' Dutch language proficiency may not suffer (Nuffic, n.d.; Rijksoverheid, n.d.b; SLO, 2017). Also, students must still take the national end-of-school exams in Dutch, which leads to most schools offering less classes in English during the last two or three years of school. These national exams are often supplemented by more international tests such as the International Baccalaureate (European Platform, 2013) or a certificate explaining that they successfully completed a bilingual secondary education (Rijksoverheid, n.d.b). By the third year of secondary school, students following a bilingual program are expected to reach level B1 (HAVO) or B2 (VWO) on the Common European Framework of References for Languages. Furthermore, students are expected to reach certain International Baccalaureate Diploma certificates by the time they finish school. For VWO students this is the *Language and Literature Higher Level* or the *Standard Level*, for HAVO students this is the *English B Higher Level* or the *Language and Literature Standard Level* (Nuffic, n.d.).

## **2.6 Research on bilingual education in the Netherlands**

A rather extensive study on Dutch bilingual secondary education was conducted by Verspoor, Schuitemaker-King, van Rein, de Bot, and Edelenbos (2010). The focus of their research project was studying how the English language acquisition process of students following bilingual education differs from students learning English through regular foreign language classes and discovering how student, class, and school characteristics related to learning language in bilingual education can be used to improve both bilingual education programs as well as regular foreign language lessons. This resulted in two research questions, the first of

which focused on language learning processes: How does the development of English language proficiency in bilingual education differ from that in regular education? The second focused on the analysis of the education system, population and classroom instruction: What is the unique composition of characteristics of the education system, population and learning processes that determines the added value of bilingual education over regular foreign language lessons?

Verspoor et al. (2010) sought to answer these questions by conducting three different studies on bilingual secondary education. The first was a longitudinal study on language proficiency levels. Students from bilingual and regular education routes were followed for a period of one or two years, with three testing moments per year. This resulted in results from the first three years of secondary school, with somewhere between 19-98 students being tested at each testing moment. Participants took two tests: an English vocabulary test (the *English as a Foreign Language Vocabulary Test*, a yes/no test with real and pseudo-words) and an English writing assignment (150 words on an everyday subject). The writing assignments were evaluated by linguists, English teachers and English and Dutch native speakers, on a scale of 0-7 that was developed by the evaluators during the process. The main conclusion of this study was that students following a bilingual education perform better on the English vocabulary test as well as the writing assignment. This result holds when correcting for the students' CITO score. This result is not seen for the first testing moment in the first year, when students have just started or are about to start their bilingual education.

The second study Verspoor et al. (2010) conducted was a study on aspects of language acquisition in bilingual education, to see if students following a bilingual education do not only acquire English faster but also in a different way. This was tested with a cross-sectional test with 500 students from different levels and school years, from both bilingual and monolingual education routes. The students were given the same writing assignment as in the first study. The written texts were scored on the same scale of 0-7 and also analyzed on more than 60 language aspects using CLAN. The main conclusion was that students from the bilingual education route use authentic and idiomatic language sooner than students from the regular monolingual education route.

Verspoor et al.'s (2010) third study focused on the didactic actions shown by teachers in bilingual education. Teachers from two bilingual secondary schools filled in a questionnaire on their views on didactics in bilingual education. Additionally, 75 bilingual classes and 10 regular education classes were filmed, with observations from the films being analyzed with an observation form. This study showed that the quality of English input given is sufficient and that teachers almost exclusively use English in class. There were large differences in the use of classroom activities and giving feedback to students.

The main conclusions that Verspoor et al. (2010) describe are as follows: they conclude that students following a bilingual program have a higher proficiency in English - especially in vocabulary and writing skills - than students following the standard, monolingual program, even when correcting for student characteristics such as the CITO score. During the third year the bilingual students' language growth slows down, but an overall positive learning effect can be seen. The studies show that the bilingual students' language acquisition is mainly implicit and they learn more *chunks* of language than monolingual students (for example in the use of idiomatic language). The schools that have bilingual programs offer high quality education, and teachers consequently use English when speaking with students. The

introduction of bilingual education does not always lead to a significant difference in the teachers' use of activating class activities.

There are a few aspects that were not covered in Verspoor et al.'s (2010) research. First of all, the research only covers the first three years of bilingual secondary education and so does not go into the students' language development after those first three years, or the level of language proficiency they ultimately reach at the end of secondary school. Furthermore, the researchers only focused on the English language development, without investigating the effect of a bilingual education on the students' Dutch language proficiency or on their other classes. Both of these aspects are addressed in the research for this thesis, as participants were selected from all six secondary school classes and a Dutch vocabulary test and exam results were included.

In 2011-2012 Verspoor, Xu and de Bot (2013) conducted a study on the effectiveness of bilingual education in Dutch secondary education, in which one of the main questions was whether bilingual education is as effective in HAVO level classes as in VWO level classes. The goal of their study was to gain a more complete view of the effect of bilingual education in HAVO classes, to gain more insight in the language proficiency levels that students reach, and to study the effect of factors such as motivation, preference for classroom methods, 'willingness to communicate', and scholarly predisposition. The main methods of testing were a receptive vocabulary test, a productive writing test, and a questionnaire. Verspoor et al. (2013) conclude that bilingual education on the HAVO level is as effective as on the VWO level and that students reach the set language proficiency goals. Additionally they provide some advice for improving the quality of bilingual education at the school where the research was conducted. As with Verspoor et al.'s 2010 research, this research project only tested the students' English language proficiency, and not their Dutch language proficiency or other school results. In this current study we intend to fill this gap by including a Dutch language test and students' exam results.

Most of the research conducted on bilingual secondary education in the Netherlands focuses on its effectiveness, but some research has been conducted on other aspects of bilingual education. Sieben & van Ginderen (2014) studied the role of social background in students' choice for bilingual education. As more and more schools offer bilingual education programs, what kind of students and parents choose to follow this course? Sieben & van Ginderen hypothesized that the positive interaction between on the one hand the language climate at home and the parents' involvement and on the other hand the choice for a bilingual VWO education is stronger for children from lower social environments than for children from higher social environments. They measured this through structured questionnaires about the students' social background and the language climate at home. The results showed that children from higher social environments are more likely to follow a bilingual education. However, this cannot be explained by the parents' involvement in school or the language climate at home. The parents' (Dutch) reading behavior plays a role for children from higher social environments, but not for children from lower social environments. The reasons for this last effect are unclear. Taking into consideration the additional factor of parent involvement, there was no correlation between the choice for a bilingual school and the parents' involvement with school or the use of English at home. Parental cultural and social behavior had less of an effect than the researchers thought. The researchers themselves write that further research should not only involve students but ask parents questions about their resources and ambitions as well. They also mention that conducting the research at a broader

range of schools would be useful, especially to study a larger number of students with an immigrant background, and to include schools that do not offer bilingual education.

In addition to parents' cultural and social background and behavior affecting their children's school choice, there is a socio-economic factor that plays a role. A bilingual secondary education is more expensive than mainstream monolingual education due to extra costs for the school and extra activities. This leads to most schools asking parents for a larger contribution (Ik Kies TTO, 2012). For parents from a lower social circle, with a lower income, this may be too high a cost.

A different study on bilingual education is Mearns' research on motivation in students following bilingual secondary education (2016). Mearns investigated whether students who choose for a bilingual secondary education are more or differently motivated than students who choose for a monolingual secondary education, or whether they become more motivated by the education they follow. The research focused on the opinions and experiences of the learners and not on the observation of classrooms. The researchers conclude that on the one hand students seem to be motivated when they start bilingual secondary education and that on the other hand bilingual education seems to motivate them further. Additionally, the results show that students in bilingual and monolingual schools may have differing needs when it comes to motivation.

Studies on the effect of bilingual secondary education in the Netherlands use a number of (language) tests to measure students' language proficiency and motivation. These include vocabulary tests (Verspoor et al., 2010; Verspoor et al. 2013), writing assignments (Verspoor et al., 2010; Verspoor et al., 2013), classroom observations (Verspoor et al., 2010), questionnaires (Verspoor et al., 2013; Sieben & van Ginderen, 2014; Mearns, 2016), and discussion sessions (Mearns, 2016). The language tests primarily test students' vocabulary (passive and active) and writing skills. In this study we have a similar approach in using the PPVT, which is a written vocabulary test. The OPT slightly broadens the approach, as it also tests students' grammar. As written above, one of the requirements of bilingual secondary education in the Netherlands is that students are required to reach CEFR level B1 (HAVO) or level B2 (VWO) by their third year and pass certain International Baccalaureate tests in their final year. OPT scores are converted to CEFR levels, which enables us to compare students' results with the requirements.

In summary, there are two important points that are missing in research that has been conducted on bilingual secondary education in the Netherlands. The first is that studies so far have concentrated on the first three years of secondary school, without including the last three years of secondary school. In this study we will include measurements from all six years of secondary school, through which we hope to gain more insight into the effects of following bilingual education throughout secondary school. The second point is that previous research has mainly focused on the English language proficiency of the students, with little attention paid to their language proficiency in Dutch. As one of the requirements for bilingual education set by the Dutch government is that students' Dutch proficiency may not suffer, one would expect that there has been some research on whether this requirement is met, but I could not find clear results for this. In this study we will include testing Dutch language proficiency through the PPVT-NL, as well as comparing bilingual and monolingual students' Dutch exam results. Through these two measurements we hope to form a first impression of the effect of bilingual education on students' native language.



### 3. Methodology

#### 3.1 School and participants

The data was collected at Varendonck College, a secondary school in Asten, in the south of the Netherlands. Varendonck College offers monolingual (Dutch) and bilingual (Dutch & English) secondary education. The school uses the CLIL approach described in Chapter 2.2.

Varendonck College offers all levels of secondary education. The bilingual education program, however, is only offered in the pre-university route (VWO), both athenaeum and gymnasium. In the first three years, students who choose for mainstream monolingual education are placed in a HAVO-VWO mixed ability class, which is split into HAVO and VWO after the third year.

Bilingual participants were selected from the bilingual athenaeum and gymnasium classes and monolingual participants were selected from the monolingual VWO-HAVO (years 1-3) and athenaeum (years 4-6) classes. Participants from years 1-3 were selected if they had a VWO advice (usually with a CITO score of 545 or higher). From years 4-6 all athenaeum and gymnasium students were tested. Students from all school years (year 1-year 6) participated. *Technasium* classes are also offered at Varendonck college. Some of this study's participants from the VWO-HAVO group followed the technasium curriculum in their third year; as this does not affect their language curriculum this was not taken into account in the analysis.

For students in the bilingual program 60% of the curriculum is delivered in English for the first three school years. From the fourth year onward, English instruction time drops to 30%, as end of school examinations have to be taken in Dutch. Bilingual subjects taught in years 1-3 are Mathematics, geography, physical education, biology, chemistry, history, religious studies, economics, European and International Orientation, and English. Bilingual subjects taught in years 4-6 are the International Baccalaureate English A: Language and Literature syllabus, civics, physical education, religious studies and the extended essay. In addition, a two-week internship abroad is compulsory in the fifth year and counts towards the teaching periods for the bilingual route. Classes given in Dutch include tutor group, Latin and Greek (for the gymnasium students), modern foreign languages (French, Spanish, German), and of course Dutch. During the modern foreign language classes, instruction in the target language is encouraged.

In addition to the students, a group of teachers was tested as well. In 2014-2015 and in 2016-2017 a number of teachers who teach bilingual classes took the Oxford Placement Test.

#### 3.2 Test instruments

The Peabody Picture Vocabulary Test (PPVT) and the online Oxford Placement Test (OPT) were used to measure the students' language proficiency. For the PPVT we used both the English and the Dutch version, as described below. Additionally, the students' CITO scores and end-of-school exam results for Dutch, English, and Mathematics were taken into account. The PPVT was chosen because it is a test of receptive vocabulary, and vocabulary is an important part of language acquisition and an indication of proficiency. The Oxford Placement Test is a more general test of language proficiency. These two tests combined give a general impression of a student's English language proficiency. Some language factors - such as

pronunciation, fluency, communication skills and writing skills - have not been tested in this research project due to contextual, time, and financial restrictions. In addition to the PPVT and OPT tests, students' CITO scores and exam results were taken into account. Only one language test - the PPVT-NL - was used to measure Dutch proficiency. However, the exam results for Dutch can also be used for this purpose.

### **3.2.1 Peabody Picture Vocabulary Test (PPVT)**

One of the tests used in this research is the Peabody Picture Vocabulary Test (PPVT), designed by Dunn & Dunn (2007). The PPVT is designed to measure receptive vocabulary for respondents of all ages starting from 2,5 years (Campbell, 1998). It can also be used to screen for factors such as verbal ability, giftedness or language difficulties, but is not a "comprehensive test of general intelligence" (Williams, 1999, p.68).

When taking the PPVT, the respondent is shown four pictures while hearing a spoken stimulus word. The respondent is asked to choose the picture that best fits the stimulus word, and may answer verbally or through pointing. In the English version the pictures were in color, in the Dutch version they were in dual color but not black and white. The stimuli are ordered in 17 sets of increasing difficulty, with 12 items per set. The raw score can be converted to a normative score such as an age equivalent, which locates the performance along the average growth curve of native speakers (Campbell, 1998; Williams, 1999).

The PPVT was originally designed for the English language. The Dutch version, the PPVT-III-NL, was translated and adapted into Dutch by Schlichting (Pearson, n.d.). The test was rated and approved by the Dutch commission on tests, COTAN, in 2006 (Taalexpert, n.d.).

As described above, the PPVT measures the receptive vocabulary. Repeated measurements of the receptive vocabulary give insight into the language development of respondents. Participating students took the PPVT 1-3 times during the three-year testing period. Data from students who took the test multiple times gives us insight into the language development of individuals, while all data together gives us insight into the language development of the group as a whole.

### **3.2.2 Oxford Placement Test (OPT)**

The Oxford Placement Test (OPT) is an English language placement test that is often used to place students in an appropriate level class or to quickly measure language ability in general. It consists of two sections - Use of English (30 questions) and Listening (15 questions) - and results in individual section scores and an overall score. It tests grammar, vocabulary and meaning in context, using multiple choice questions and questions where participants have to type a short answer. The test exists in both a British and an American version.

The OPT is administered online and is a "computer adaptive test" (Oxford English Testing, n.d.a). As the participant takes the test, the questions presented are chosen based on the results so far. This results in the participant only having to answer questions that are "relevant to his or her level of language ability" (Oxford English Testing, n.d.a). The difficulty level of the different items has been determined by pre-testing.

The resulting score is used to place the respondent in the Common European Framework of Reference (CEFR) levels, ranging from A1: *breakthrough* to C2: *mastery*, with A1 being beginner and C2 being native speaker ability. See Table 3.1 for an overview of the CEFR levels.

The Oxford Placement Test was useful in this research project as it gives a more complete indication of the student's language ability (in comparison with the PPVT, which only measures receptive vocabulary). Additionally, the CEFR levels are used by the school to indicate what level students should reach by the end of their school years. These levels are also used by the Dutch education system in general to indicate which level students should reach. By the end of year 3, students following the bilingual education route are expected to reach level B2. A further explanation of the levels students are expected to reach is found in Chapter 2.5.

At Varendonck College, teachers who start teaching lower secondary bilingual classes are expected to have at least level B2, while teachers who teach upper secondary are expected to have at least level C1.

Table 3.1

*CEFR levels and corresponding OPT scores*

OPT score		CEFR level	
0-1	Pre-A1 (A0)		
1-20	A1	Breakthrough	Basic user
20-40	A2	Waystage	
40-60	B1	Threshold	Independent user
60-80	B2	Vantage	
80-100	C1	Proficiency	Proficient user
100-120	C2	Mastery	

*Note.* From Oxford English Testing (n.d.b) and Council of Europe (2001)

### 3.2.3 CITO

The Dutch central institute for the development of tests is the *Centraal Instituut Toetsontwikkeling*, or CITO. Among other things, they develop and administer the national VWO and HAVO exams and the CITO test for the end of primary school. Most Dutch students take the CITO test during the last year of primary school. This is a test on Dutch language, Mathematics, and, optionally, world orientation. The CITO test is developed by testing experts and primary school teachers in collaboration with CITO. The test result is a score between 501 and 550, which gives an indication as to which level of secondary school would be advised. The final advice is based on the CITO result and the primary school teacher's advice (CITO, n.d.b).

To qualify for the bilingual program at Varendonck College, students must have a VWO advice (usually with a CITO score of 545 or higher). Sometimes exceptions are made for students with lower CITO scores, based on the student's background or motivation, particularly so for the very first cohort of students when Varendonck College started the bilingual route. Some of these students are included in our research: the sixth-year students from 2014-2015.

We have included the CITO scores in our analysis because they are an important factor in the school level that students follow and in the choice for a bilingual or monolingual education.

### **3.2.4 Exam Results**

During the final year of secondary school, all students take their final school exams and nation-wide exams (*centraal schriftelijk examen*). The results of these two exams are then averaged to form their final exam result. This final exam result is rounded off to a whole number by the school. In our analysis we have not used this rounded off grade, but the average with one decimal, to create a more detailed analysis. The Dutch school system works with a grade scale of 1-10, with 5.5 being the minimal pass grade.

We have collected the results for three subjects: Dutch, English and Mathematics level A/B. These three subjects have been chosen because they are core subjects and students are not allowed to have a 5 (fail) for any of these core subjects in order to obtain a pre-university (VWO) diploma. Also, Mathematics is one of the subjects taught in English for the bilingual route (during the first three school years).

### **3.3 Data collection**

Data was collected during three consecutive school years: 2014-2015, 2015-2016, and 2016-2017. In the first year, 2014-2015, a group of students from year 1 and year 4 were selected, who were then tested in each consecutive year. This resulted in a group of participants who were tested in school year 1, 2, and 3, and a group of participants who were tested in school year 4, 5, and 6. Furthermore, in each year we tested a group of sixth-year students. In 2014-2015 one additional group of students in year 2 was tested. Permission was granted by the parents for all participating students. Tests were administered during school hours and under the supervision of a teacher.

The PPVT was administered on paper, in a one-on-one setting with a researcher, in a quiet room in the school. The researcher was a (near-)native speaker, or else a recording of a native speaker was used. In the middle year of data collection the test was administered on a laptop with recordings of a native speaker. All PPVT data from teachers was collected in the first year.

For the English tests the PPVT-IV Form A was used. The test was administered starting from the very beginning of the test, and was stopped when the participant made eight or more mistakes in a set of questions (there are 17 sets of 12 questions). For the Dutch PPVT the test was administered starting from the point advised for the participant's age, and was stopped when the participant made eight or more mistakes in a set of questions.

The participants took a version of the OPT in which 50% of the questions were in American English and 50% were in British English. The OPT was administered digitally in a classroom setting. Some students took the test individually if they had been absent at the time their class took the test. Teachers took the test individually. Exam results and CITO scores were taken from the school records.

### 3.4 Data analysis

In preparation of the analysis all data was checked for inconsistencies. The following variables were included: student number, test cycle, CITO score, bilingual/monolingual, number of years of bilingual education, class, school level, PPVT scores, OPT scores, and exam results. One group of participants was not included in the data: the students who switched from bilingual to monolingual education at some point during their secondary school years. They were excluded because they switched at different points during their education, causing any conclusions about their language progress to be unreliable.

For the analysis we first described the data, including which different groups there were and how many participants were in each group. We then studied the data from three different perspectives, or three selections of data. The first perspective was analyzing all collected data, including participants from all school years and participants who were tested one, two, or three times. The second perspective was analyzing the data from participants who were measured multiple times to gain insight in individual growth curves: the longitudinal data. For the PPVT we selected participants who took the PPVT three times. For the OPT we selected participants who took the OPT twice, as it was administered in the first and last year of the research project. The third perspective consisted of all data from students in their final school year, including their school exam results: the exam year data. The teacher data was included in all three perspectives. All data was analyzed using means, bar-graphs, and scatter plots. Statistical tests including linear mixed models were used to analyze the longitudinal data and the exam year data.

### 3.5 Collected data

Over the course of the three school years (2014-15, 2015-16, 2016-17) a total of 258 students participated in the study. Students were tested once per school year, either in November/December or in March/April. 98 of these students have been tested three times, 31 have been tested twice and 129 students have been tested once. Of the students who were tested twice some were tested in 2014-15 & 2015-16, some in 2014-2015 & 2016-17, and some in 2015-16 & 2016-17.

All participants have been tested 1, 2, or 3 times. However, due to practical restraints, they did not participate in all tests every time. Therefore it is possible that a participant was tested three times but only took the PPVT-NL or PPVT-EN once or twice. 61 participants (41 bilingual, 20 monolingual) took the PPVT-NL two or three times and 97 participants (76 bilingual, 21 monolingual) took the PPVT-EN two or three times. The OPT was administered twice, in 2014-15 and 2016-17. 98 participants took the OPT twice: 69 bilingual and 29 monolingual. This resulted in a different number of measurements for each school year, group and test. An overview of the number of measurements is laid out in Table 3.2.

179 of all participants followed the bilingual education route (69%), this is the experimental group, and 79 followed the monolingual education route (31%), this is the control group. For the students who were tested three times the proportion bilingual : monolingual was 75 : 23. The number of participants in the monolingual group was smaller than the number of participants in the bilingual group because there were less students following the monolingual education route at Varendonck College, especially in the first three years of secondary school.

Varendonck College offers all the different secondary school levels (VMBO, HAVO, and VWO athenaeum/gymnasium). The participants in the experimental group were students from the athenaeum (n=142) and gymnasium (n=37) routes. The participants in the control group were students from the athenaeum (n=58) and VWO-HAVO (n=21) classes. As mentioned in Chapter 3.1, the VWO-HAVO students followed the additional technasium curriculum in the third year. These levels are not included as a factor in the analysis, as the majority of the students are from the VWO level. We do include students' CITO score, which is the basis for placement in these levels.

For most participants, Dutch was their first language. Four students had a different mother tongue, of which one had English as their first language. Because these students were also fluent in Dutch they were included in the data. Compared to other students of the same age, the English native speaker scored at the high end of the range (for the PPVT-EN), but not highest of all.

A total of 36 teachers were tested in 2014-2015 and 2016-2017. In 2014-2015, 14 teachers took the PPVT-NL and 27 teachers took the PPVT-EN. 30 teachers took the Oxford Placement Test, with almost half (n=14) taking it twice. In the case of teachers who were tested twice, their two scores were averaged for the analysis (see Table 3.2).

Table 3.2

*Number of results per test and experimental group*

<b>Control group: monolingual</b>				
	<b>PPVT-EN</b>	<b>PPVT-NL</b>	<b>OPT</b>	<b>Exam Results</b>
<b>1</b>	17	21	20	0
<b>2</b>	0	10	0	0
<b>3</b>	7	0	18	0
<b>4</b>	10	2	14	0
<b>5</b>	10	13	0	0
<b>6</b>	57	42	40	59
<b>Experimental group: bilingual</b>				
	<b>PPVT-EN</b>	<b>PPVT-NL</b>	<b>OPT</b>	<b>Exam Results</b>
<b>1</b>	22	55	51	0
<b>2</b>	62	59	36	0
<b>3</b>	39	0	40	0
<b>4</b>	34	14	36	0
<b>5</b>	31	19	0	0
<b>6</b>	69	64	45	78
<b>Teachers</b>				
	<b>PPVT-EN</b>	<b>PPVT-NL</b>	<b>OPT</b>	<b>Exam Results</b>
<b>Teachers</b>	27	14	30	0

## 4. Results

As explained in Chapter 3.4, we analyzed the data from three perspectives: all data, longitudinal data, and exam year data.

First, two notes on terminology and labeling. The term ‘monolingual’ is used for the mainstream education route, where students follow classes in Dutch, but do have foreign language lessons, including English. In all graphs, the monolingual control group is labeled ‘niet-tto’ and the bilingual experimental group is labeled ‘tto’, after the Dutch term for bilingual education, *Tweetalig Onderwijs* and the Dutch word for ‘no(t)’.

### 4.1 All measurements

We will first analyze all data from all participants, whether they were tested once, twice, or thrice. Participants who were tested more than once were tested in years 1-2-3 or years 4-5-6.

#### 4.1.1 PPVT-EN

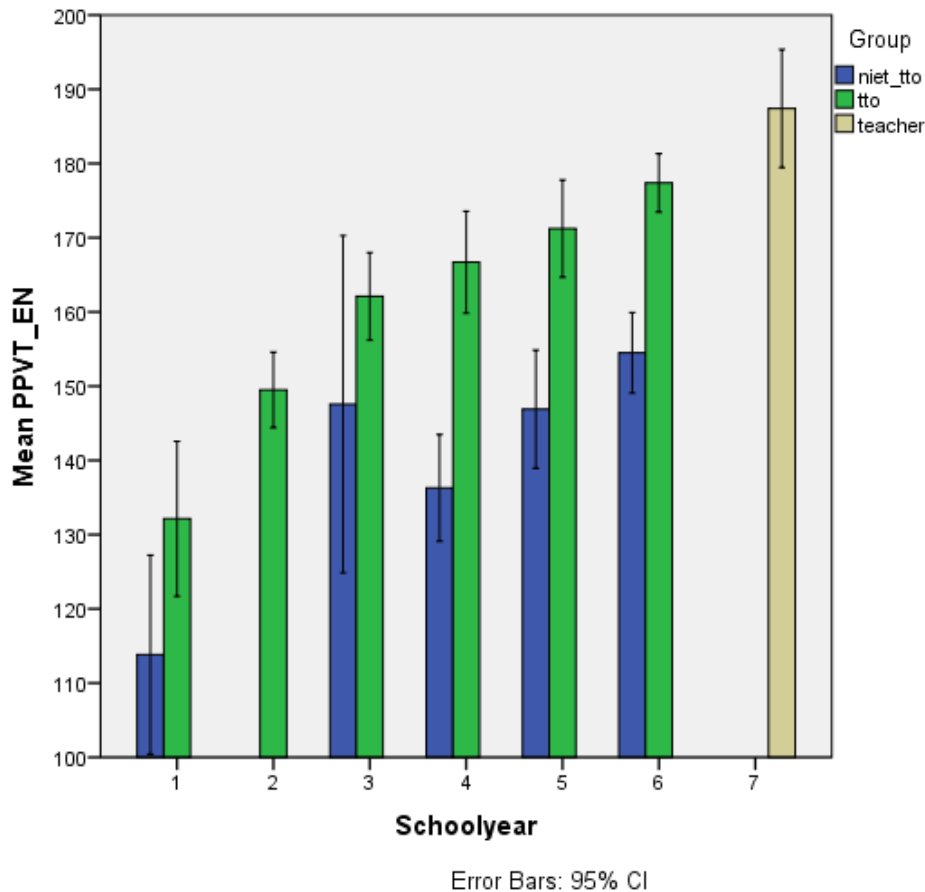


Figure 4.1. Mean PPVT-EN scores per school year and experimental group

Table 4.1

<i>Mean PPVT-EN scores per school year and experimental group</i>							
Group	School year	Mean	N	Std. Deviation	Minimum	Maximum	Range
Monolingual	1	113.82	17	26.097	79	175	96
	2	-	0	-	-	-	-
	3	147.57	7	24.569	122	190	68
	4	136.30	10	10.067	117	153	36
	5	146.90	10	11.120	131	165	34
	6	154.49	57	20.494	104	200	96
Bilingual	1	132.14	22	23.552	79	173	94
	2	149.50	62	20.035	89	189	100
	3	162.10	39	18.197	118	201	83
	4	166.71	34	19.700	115	203	88
	5	171.23	31	17.826	141	206	65
	6	177.39	69	16.366	141	211	70
Teachers	n.a.	187.41	27	20.083	147	215	68

The average PPVT-EN scores for each year are shown in Fig. 4.1, split according to test group. Over time the average scores rise for both the bilingual and the monolingual group. For the monolingual group we see a drop in scores between the third and fourth year, this is probably affected by the fact that the participants in years 4-6 are a different longitudinal group than those in years 1-3. In the monolingual group no participants took the PPVT-EN during their second year of secondary school. Bilingual students from year 1 to year 6 consistently score higher than monolingual students from the same years.

In addition to the students' scores, Fig. 4.1 also shows the teachers' PPVT-EN scores (year '7'). On average, teachers score higher than students, as can be seen in the figure. Table 4.1 shows that there is overlap between students' and teachers' scores in each age group of each test group, particularly in the higher grades.

Table 4.2

<i>Age Equivalents PPVT-EN</i>			
Age	Range	Age	Range
6	98 - 115	14	181 - 185
8	128 - 141	16	190 - 193
10	152 - 158	18	197 - 198
12	168 - 173	20	200 - 201

*Note.* From Dunn & Dunn, 2007.

The PPVT-EN manual (Dunn & Dunn 2007) includes information on the age equivalents for English native speakers, a selection of which is shown in Table 4.2. The monolingual group has an average PPVT-EN score of 113.8 in year 1, which is in the range of a 6-year-old native speaker. By year 6 their average score has risen to 154.5, which is in the range of 10-year-old native speaker. The bilingual group has an average PPVT-EN score of 132.1 in year 1, which is in the range of an 8-year-old native speaker. By year 6 their average score has risen to 177.4, which is in the range of a 13-year-old native speaker. On average the teachers score 187.41, on the level of 15-year-old native speakers.

There is quite a bit of variation within the different groups (see Table 4.1). In the first-year monolingual group there are students who score at the level of a 4-year-old native speaker, but also students who score at the level of 13-year-old native speakers. In the sixth year



monolingual group there are students who score at the level of 21-year-old native speakers, but also students who are at the level of 6-year-old native speakers. This variation is also present in the bilingual group: first-year bilingual students' proficiency ranges from the level of 4 to 12-year-old native speakers, while the proficiency of sixth-year students ranges from 8-year-old native speaker proficiency to that of native speakers older than 24. The school years in between show the same variation. The teachers' scores show quite some variation as well: their scores range from the level of 9-year-olds to that of adult native speakers.

#### 4.1.2 PPVT-NL

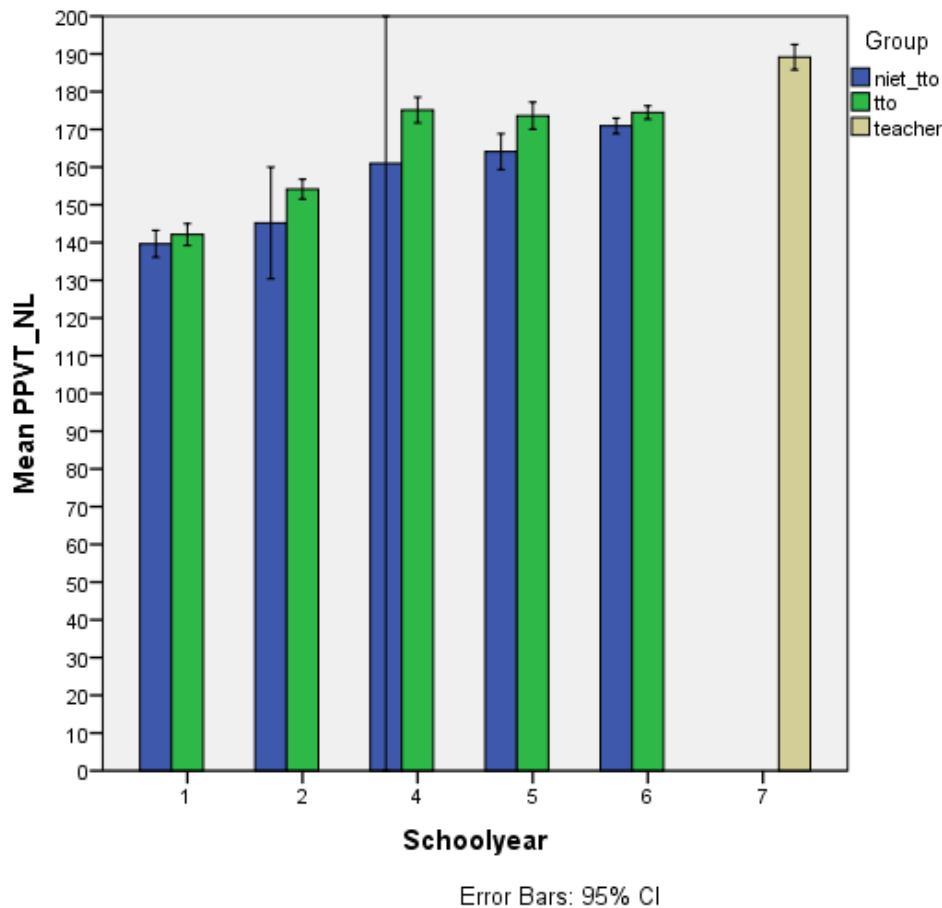


Figure 4.2. Mean PPVT-NL scores per school year and experimental group

Table 4.3

<i>Mean PPVT-NL scores per school year and experimental group</i>							
Group	School year	Mean	N	Std. Deviation	Minimum	Maximum	Range
Monolingual	1	139.67	21	7.832	122	154	32
	2	145.20	10	20.676	100	171	71
	3	-	0	-	-	-	-
	4	161.00	2	21.213	146	176	30
	5	164.08	13	7.889	151	175	24
	6	170.93	42	6.649	156	184	28
Bilingual	1	142.13	55	10.738	119	168	49
	2	154.17	59	10.014	134	173	39
	3	-	0	-	-	-	-
	4	175.14	14	5.908	165	188	23
	5	173.63	19	7.380	166	190	24
	6	174.45	64	7.006	155	193	38
Teachers	n.a.	189.14	14	5.829	179	200	21

The average PPVT-NL scores for each year, split according to test group, are shown in Fig. 4.2. There are no PPVT-NL results for year 3 for both the monolingual and bilingual group. For the monolingual group we can see a rise in scores over time. The error bar that stretches across the graph in year 4 is an error due to the fact that there are only two results for that group in that year. For the bilingual group we see a rise in average scores which levels off after year 4. The average scores seem to fall in year 5 and 6, but this is a small difference that is due to the varying number of results and the varying participants per year. Starting from year 1, the students in the bilingual education route score slightly higher on average than the students in the monolingual education route.

In addition to the students' scores, Fig. 4.2 also shows the teachers' PPVT-NL scores (year '7' in the figure). As can be seen in the figure, on average the teachers score higher than the students, including sixth-year students. Table 4.3 shows that there is overlap between teachers' and students' scores starting from year 4 upwards. However, there is less variance within the group of teachers than for the PPVT-EN. Additionally, the difference between teachers and students is more pronounced: there is less overlap.

Table 4.4

<i>Age Equivalents PPVT-NL</i>			
Age	Range	Age	Range
6	81 - 91	14	143 - 147
8	101 - 108	16	153 - 157
10	117 - 123	18	162 - 165
12	130 - 136	20	169 - 170

*Note.* From Schlichting, 2008.

Table 4.4 shows a selection of age equivalents for Dutch native speakers, taken from the PPVT-NL manual (Schlichting, 2008). The monolingual group has an average PPVT-NL score of 139.7 in year 1, and the bilingual group has an average score of 142.1 in year 1. Both these scores are in the expected range for a 13-year-old native speaker. First-year students are usually 13 years old, so they are scoring as expected.

By year 6 the monolingual group's average score has risen to 170.9, which is in the range of 20 or 21-year-olds. The bilingual group's score has risen to 174.5, which is in the range of 23-year-olds. Students in year 6 are usually 17 or 18, so these scores are above average. As these

students are following the highest level of Dutch secondary education which prepares them for university, this is not abnormal. All teachers score above the range of 23-year-olds, which is to be expected.

There is less variation in the PPVT-NL scores than in the PPVT-EN scores, but there are still significant differences (see Table 4.3). In the first year, monolingual students' scores range from that expected of 10-year-olds to that of 16-year-olds. By the sixth year, their scores range from that expected of 16-year-olds to that expected of adults in their late thirties. For first-year bilingual students, scores range from that of 10-year-olds to that of 19-year-olds, while in the sixth year some score at the level of 16-year-olds and others score off the age equivalency charts. This variation is also seen in the school years in between.

#### 4.1.3 Oxford Placement Test

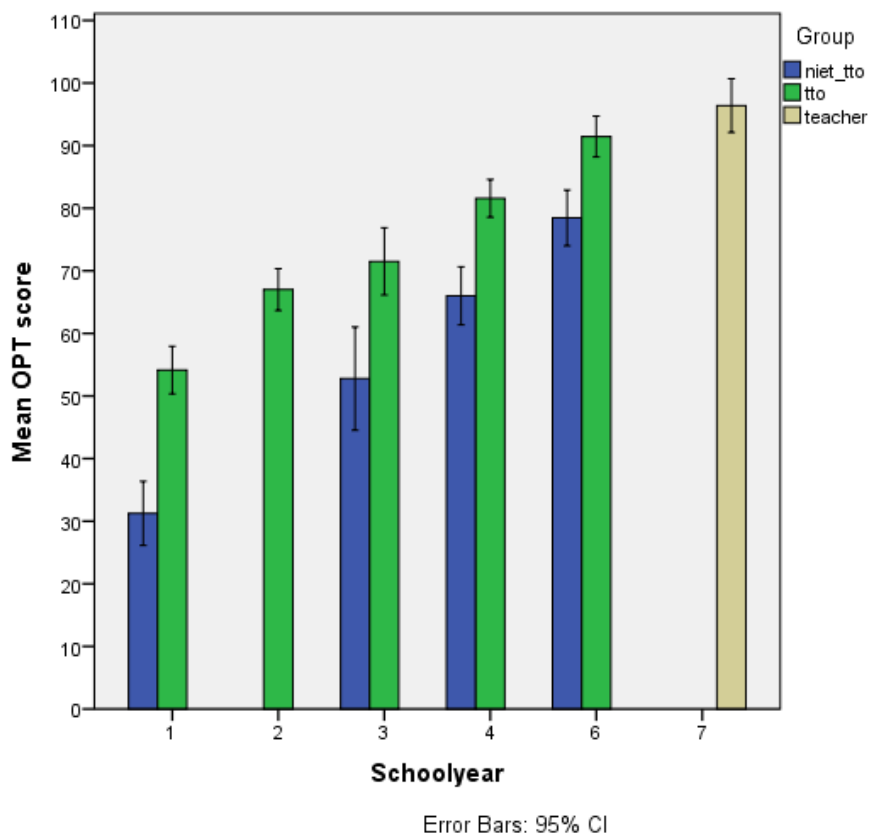


Figure 4.3. Mean OPT score per school year and experimental group

Table 4.5

<i>Mean OPT score per school year and experimental group</i>							
Group	School year	Mean	N	Std. Deviation	Minimum	Maximum	Range
Monolingual	1	31.25	20	10.939	8	55	47
	2	-	0	-	-	-	-
	3	52.78	18	16.566	30	87	57
	4	66.00	14	8.019	50	77	27
	5	-	0	-	-	-	-
	6	78.45	40	13.904	42	101	59
Bilingual	1	54.16	51	13.478	32	91	59
	2	67.00	36	9.827	49	90	41
	3	71.50	40	16.796	32	100	68
	4	81.58	36	8.917	61	103	42
	5	-	0	-	-	-	-
	6	91.44	45	10.874	74	116	42
Teachers	n.a.	96.38	30	11.472	73	119	46

Fig. 4.3 shows the students' and teachers' average scores for the Oxford Placement Test (OPT), with year '7' being the teachers. These are the general OPT results, not the separate scores for Use of English and Listening. There are no OPT results for the monolingual second year and no OPT results for the fifth year for either test groups.

The figure shows that the students' scores in both groups rise over time, with the bilingual group consistently scoring higher than the monolingual group, including the first year of secondary school.

The teachers' average OPT scores are included in Fig. 4.3 (year '7'). This is the average of all 30 teachers' scores; for teachers who were tested twice their two scores were averaged first. 14 teachers were tested twice; 9 of them had a better score on the second test, 5 of them had a slightly lower score on the second test.

Table 4.6

<i>CEFR levels and corresponding OPT scores</i>					
CEFR level	OPT score	CEFR level	OPT score	CEFR level	OPT score
A1	1-20	B1	40-60	C1	80-100
A2	20-40	B2	60-80	C2	100-120

Note. From Oxford English Testing (n.d.b) and Council of Europe (2001)

As described in Chapter 3.2.2, OPT scores can be translated into CEFR levels, which indicate the level of the subject's language proficiency (see Table 4.6). The average OPT score for monolingual students in the first year is 31.3, which translates to CEFR level A2. By year 6, their average score has risen to 78.5, which translates to a high level B2. Bilingual students in year 1 have an average OPT score of 54.16, which translates to level B1. By year 6, their average score has risen to 91.4, which translates to CEFR level C1. Monolingual students are expected to reach level B2 by the time they graduate, so those participants score as expected. Bilingual students are expected to reach level B2 by year 3. As students were tested at different moments in the school year it is not possible to say if they all reached this by the end of the third year, but in the fourth year they do all score on level B2 or higher. The average OPT score for teachers was 96.4. This score translates to CEFR level C1. That both the teachers and the year 6 students score on level C1 on average and that there is overlap in both groups' scores shows that by year 6 a number of students have reached the same level of English as their teachers. In fact, this overlap is seen in all school years, and

there are even some first-year students who have scores in the same range as the teachers. This overlap is partly explained by the wide range of results (see Table 4.5).

#### 4.1.4 Comparing PPVT & OPT scores

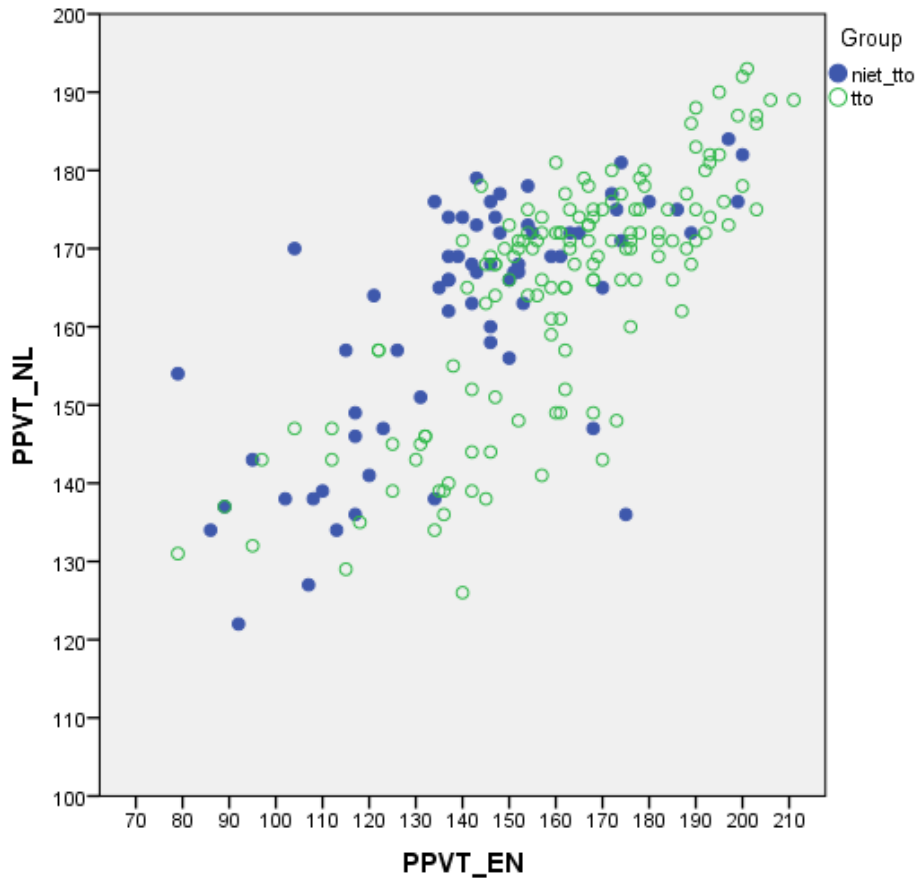


Figure 4.4. Individual PPVT-NL score vs. PPVT-EN score

Comparing students' PPVT-NL scores with their PPVT-EN scores results in Fig. 4.4. Overall, students who score higher on the PPVT-NL also score higher on the PPVT-EN. Statistical testing for correlation between PPVT-NL and PPVT-EN results in a strong correlation between the two (Pearson's Correlation=.739,  $p=.000$ ). The range for the PPVT-NL is broader than the range for the PPVT-EN, which is to be expected as this graph includes data from all school years as well as data from the monolingual and bilingual groups.

When comparing the PPVT-NL scores with the PPVT-EN scores, a number of participants lie further away from the group. Two monolingual students have high PPVT-NL scores compared with their PPVT-EN scores. The monolingual student with a PPVT-NL of 154 and a PPVT-EN of 79 (high NL, low EN) is a first-year student. The monolingual student with a PPVT-NL score of 170 and a PPVT-EN score of 104 (high NL, low EN) is a sixth-year student. Additionally, two students have high PPVT-EN scores compared with their PPVT-NL scores. The monolingual student with a PPVT-NL score of 136 and a PPVT-EN score of 175 (low NL, high EN) is a first-year student. The bilingual student with a PPVT-NL score of 126 and a PPVT-EN score of 140 (low NL, high EN) is also a first-year student. For the monolingual students, it is not odd that some students, especially first-year students, have a relatively low PPVT-EN score. For the

monolingual and bilingual first-year students with a relatively high PPVT-EN score for their PPVT-NL score there do not seem to be any special circumstances, it may just be students who like / are good at English. The PPVT-NL score by itself is not abnormally low.

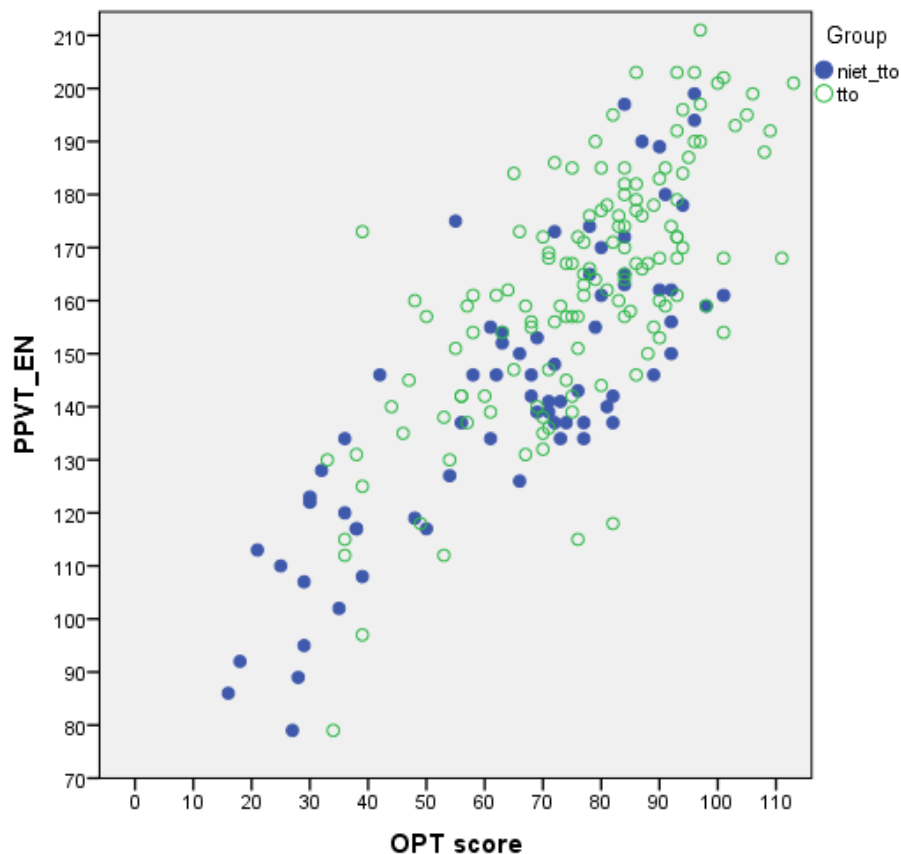


Figure 4.5. Individual PPVT-EN score vs. OPT score

Comparing the participants' PPVT-EN scores with their OPT scores results in Fig. 4.5. The scatterplot shows that in general, students with higher PPVT-EN scores have higher OPT scores and students with lower PPVT-EN scores have lower OPT scores. Statistical testing for correlation between PPVT-EN and OPT results in a strong correlation between the two (Pearson's Correlation=.788,  $p=.000$ ). In general, bilingual students score higher than monolingual students, which reflects their higher English language proficiency. Both groups show a wide range of results, this is also due to the fact that this graph includes data from students from all school years.

When comparing the PPVT-EN scores with the OPT scores, a number of participants lie further away from the group. One bilingual student has a relatively high PPVT-EN score compared to their OPT score and two bilingual students have a relatively low PPVT-EN score compared to their OPT scores. As the two tests measure different aspects of the English language and none of these students score extremely low/high on one test, this may mean that these students are more proficient in one area, for example in vocabulary or in using language in context.

## 4.2 Longitudinal data

The second perspective from which the data was analyzed was selecting participants who were tested multiple times, to see how the language proficiency of individual students progresses over time. From the PPVT data we selected participants who were tested in three consecutive years. This analysis only includes the PPVT-EN scores as there were too few results for the PPVT-NL. From the OPT data we selected participants who were tested twice, as the OPT was administered twice.

### 4.2.1 Longitudinal PPVT-EN

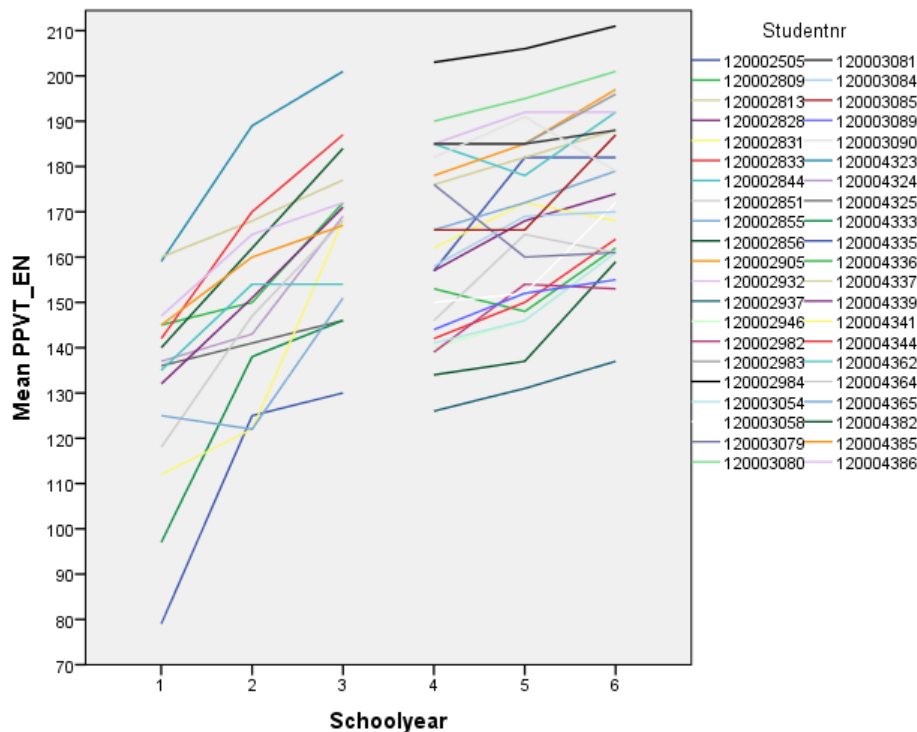


Figure 4.6. Bilingual students' individual PPVT-EN scores over time

Fig. 4.6 shows the progress in PPVT-EN scores for participants in the bilingual group who were tested in three consecutive years. The graph shows that these students were tested either in years 1 - 3 or years 4 - 6. Most students clearly make progress in their English vocabulary.

There are some notable cases in which a student's score decreases in the second year and then increases in the third year, as well as a number of cases in which students' scores increased in the second year but decreased in the third year. Varendonck College was able to provide some extra information on these students, such as their performance on an intelligence test and significant life events. Due to privacy reasons, we could not collect much of this information but the information we were able to consult showed no clear pattern or link between these factors and a student's score. Some students' performance could be explained by these factors, but others could not.

As could be seen in the analysis of all data, there are a number of first-year students who score on the same level as fourth, fifth, or even sixth-year students. This raises the question of whether the level of incoming first-year students is increasing over time.

Using linear mixed models to analyze the longitudinal PPVT-EN data, including both the bilingual and monolingual group, yielded the results shown in Tables 4.7 and 4.8. There is a significant effect of both experimental group ( $p=.003$ ) and school year ( $p=.000$ ). The bilingual group scores higher on the PPVT-EN than the monolingual group. As the students progress to higher school years, their scores increase. However, there is no significant interaction effect between group and school year, and the difference between the two groups stays constant. The difference between school years does change: it decreases over time. Between year 1 and year 2 the difference is 18.625, while between year 5 and year 6 it is only 6.095. This pattern could be due to a number of reasons, such as the test design or that second language learners' proficiency grows faster at first and then slows down. The difference between school years is especially small between year 3 and year 4, which is the transition from one group of participants to the other.

Table 4.7

*Type III Tests of Fixed Effects: PPVT-EN<sup>a</sup>*

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	39.013	1663.807	.000
Group	1	39.013	10.438	.003
Schoolyear	5	48.038	39.939	.000
Group * Schoolyear	2	56.269	.458	.635

a. Dependent Variable: PPVT\_EN.

Table 4.8

*Estimates of Fixed Effects: PPVT-EN<sup>a</sup>*

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	179.523810	3.833506	49.938	46.830	.000	171.823749	187.223870
Group=niet_tto	-23.523810	8.741738	49.938	-2.691	.010	-41.082649	-5.964970
Group=tto	0 <sup>b</sup>	0	.	.	.	.	.
Schoolyear=1	-47.711310	5.829576	49.938	-8.184	.000	-59.420720	-36.001899
Schoolyear=2	-29.086310	5.829576	49.938	-4.989	.000	-40.795720	-17.376899
Schoolyear=3	-13.086310	5.829576	49.938	-2.245	.029	-24.795720	-1.376899
Schoolyear=4	-11.619048	2.431069	40.958	-4.779	.000	-16.528842	-6.709253
Schoolyear=5	-6.095238	2.239456	66.782	-2.722	.008	-10.565480	-1.624997
Schoolyear=6	0 <sup>b</sup>	0	.	.	.	.	.

a. Dependent Variable: PPVT\_EN.

b. This parameter is set to zero because it is redundant.



### 4.2.2 Longitudinal OPT

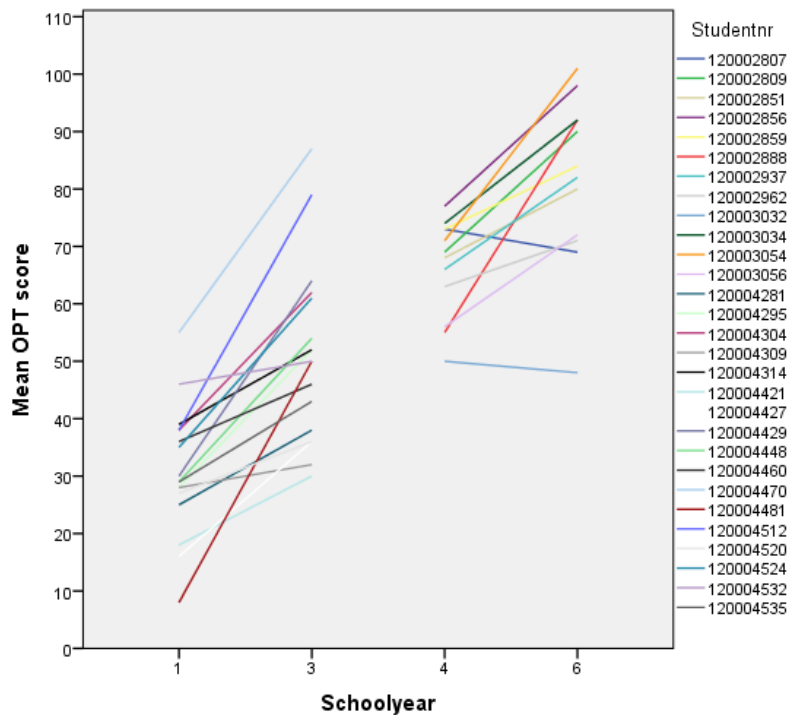


Figure 4.7. Monolingual students' individual OPT scores over time

Fig. 4.7 shows the progress in OPT scores for participants in the monolingual group who took the OPT twice. The graph shows that these students were tested either in years 1 - 3 or years 4 - 6. Most students clearly make progress in their English proficiency.

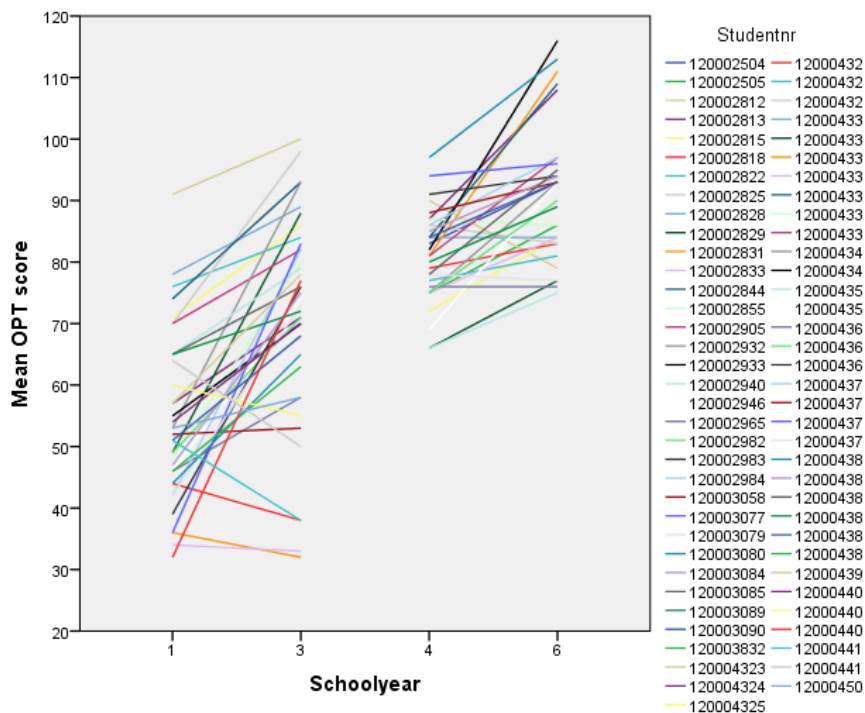


Figure 4.8. Bilingual students' individual OPT scores over time

The progress in OPT scores for bilingual students who took the OPT twice is shown in Fig. 4.8. The graph shows that these students were tested either in years 1 - 3 or years 4 - 6. Most students clearly make progress in their English proficiency.

As with the longitudinal PPVT-EN results, there are a number of both bilingual and monolingual students whose OPT score decreased from the first to the second year. As with the PPVT-EN results, we tried to see if there was a clear connection between students' OPT score and factors such as intelligence tests or significant life events but no clear patterns were observed. Some students' performance could be explained by these factors, but others could not. As with the PPVT-EN results, there are some first-year students who score on the same level as fourth or sixth-year students, confirming the question of whether the language proficiency of incoming first-year students is increasing.

Using linear mixed models to analyze the longitudinal OPT data for both the bilingual and monolingual group yielded the results shown in Tables 4.9 and 4.10. There is a significant effect of both experimental group ( $p=.000$ ) and school year ( $p=.000$ ). The bilingual group scores higher than the monolingual group on the OPT and students' scores increase as they progress to higher school years. However, there is no significant interaction effect between group and school year: the difference between groups stays constant over the years. Other than with the PPVT-EN data, the difference between school years does not decrease, with the difference between the year 1 and year 3 being 16.805 and the difference between year 4 and year 6 being 19.995. The fact that the OPT was only administered in the first and last year may have affected this. The difference between year 3 and year 4 is smaller than between the other years, as with the PPVT-EN data this is the transition point from one group of participants to the other.

Table 4.9

*Type III Tests of Fixed Effects: OPT<sup>a</sup>*

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	186.745	975.435	.000
Group	1	93.990	44.102	.000
Schoolyear	4	134.036	62.341	.000
Group * Schoolyear	3	127.026	1.902	.133

a. Dependent Variable: OPT score.

Table 4.10

*Estimates of Fixed Effects: OPT<sup>a</sup>*

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	91.258065	2.358728	148.615	38.690	.000	86.597088	95.919041
Group= niet_tto	-9.674731	4.465000	148.615	-2.167	.032	-18.497818	-.851645
Group=tto	0 <sup>b</sup>	0	.	.	.	.	.
Schoolyear=1	-36.800368	3.192630	149.703	-11.527	.000	-43.108806	-30.491931
Schoolyear=2	-22.192817	11.579628	157.050	-1.917	.057	-45.064715	.679080
Schoolyear=3	-19.994907	3.178415	148.615	-6.291	.000	-26.275630	-13.714183
Schoolyear=4	-10.258065	2.331296	93.356	-4.400	.000	-14.887323	-5.628806
Schoolyear=6	0 <sup>b</sup>	0	.	.	.	.	.

a. Dependent Variable: OPT score.

b. This parameter is set to zero because it is redundant.

### 4.3 Exam year students

For the third and final perspective we selected the results from students in their sixth and final year of secondary school, from both the monolingual and bilingual group: the exam year students. This data was collected in 2014-15, 2015-16, and 2016-17.

#### 4.3.1 Exam year data

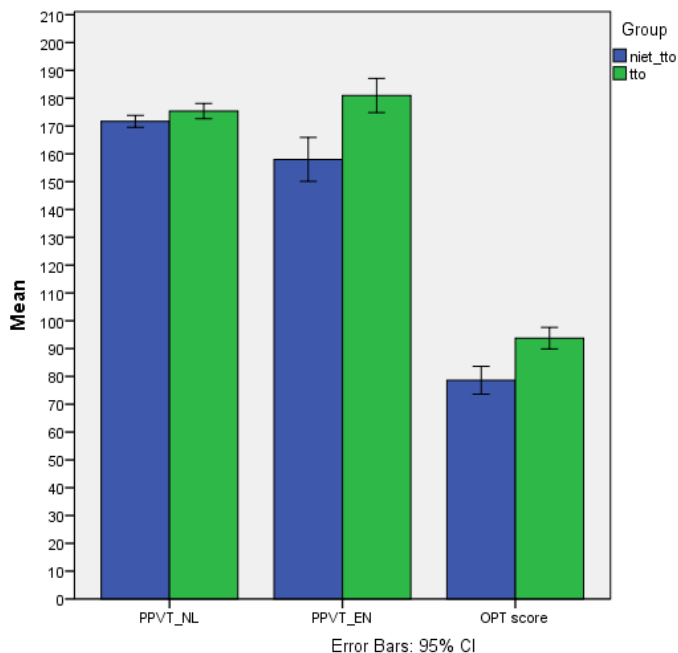


Figure 4.9. Exam year students' mean PPVT-NL, PPVT-EN, and OPT scores per experimental group

Fig. 4.9 shows the average PPVT-NL, PPVT-EN and OPT scores for students in the final school year. In all three cases the bilingual students on average score higher than the monolingual students, though the difference is minimal for the PPVT-NL.

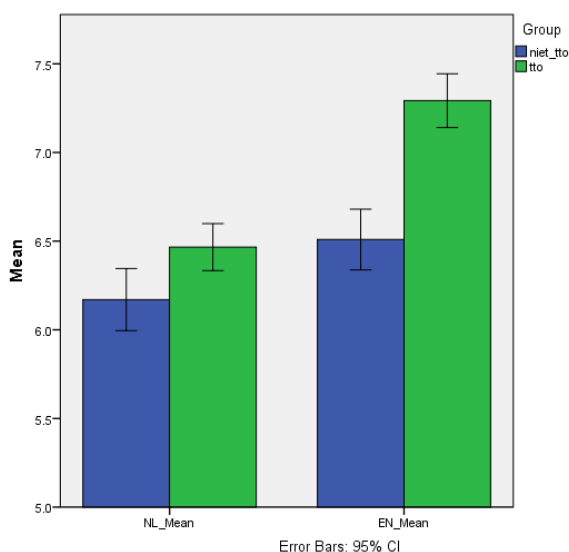


Figure 4.10. Exam year students' mean Dutch and English exam scores per experimental group

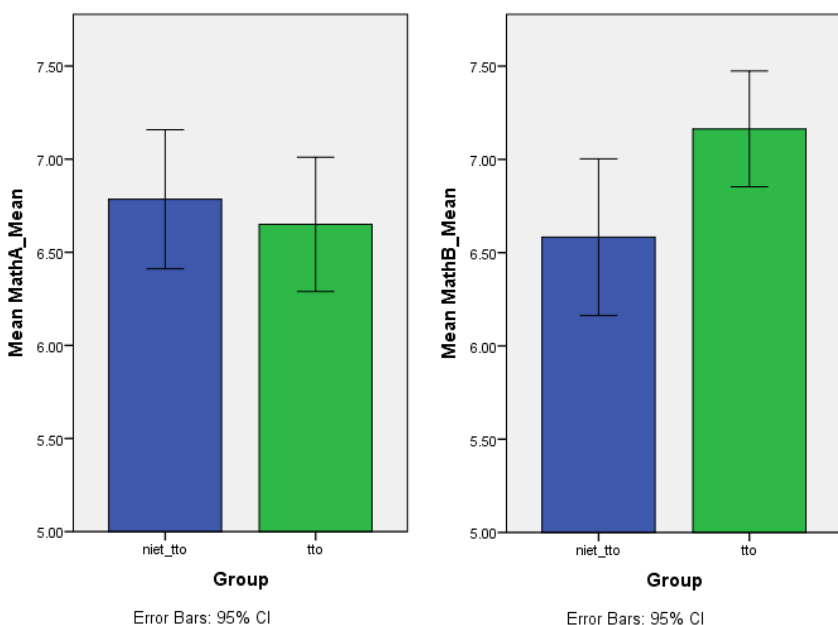


Figure 4.11. Exam year students' mean Mathematics-A and Mathematics-B exam scores per experimental group

Students' average grades for their exams in the subjects Dutch, English, and Mathematics A/B are shown in Fig. 4.10 and Fig. 4.11. The Dutch school system uses a 1-10 grade scale, with 5.5 being the minimal pass grade. For the Dutch exam, bilingual students on average score less than 0.5 point higher than the monolingual students. The difference is more marked for the English exam, with bilingual students scoring on average almost 1 point higher than monolingual students. For the Mathematics exam, monolingual students following Mathematics A score slightly higher than bilingual students, while for Mathematics B the bilingual students score about 0.5 point higher than their monolingual counterparts.

Table 4.11

*Exam year students' mean exam scores per experimental group*

Group		Dutch	English	Mathematics A	Mathematics B
Monolingual	Mean	6.170	6.513	6.7846	6.5833
	N	59	60	26	33
	Std. Deviation	.6726	.6521	.92539	1.18445
	Minimum	4.5	5.1	5.15	4.50
	Maximum	7.9	8.0	8.30	9.80
	Range	3.4	3.0	3.15	5.30
Bilingual	Mean	6.467	7.280	6.6500	7.1632
	N	78	80	25	53
	Std. Deviation	.5876	.6697	.87381	1.12537
	Minimum	5.4	5.9	5.40	4.95
	Maximum	8.0	8.8	8.20	9.30
	Range	2.6	3.0	2.80	4.35

The ranges of exam results are shown in Table 4.11. The cut-off to pass exams is 5.5; students who did not pass are included in these results. The broadest range of results is seen in the Mathematics B results, for both the monolingual (5.30 points difference between the highest and lowest scores) and bilingual (4.35 points) groups. For the other subjects the scores range between 2.6 and 3.4 points, with the monolingual groups having slightly broader ranges.

Table 4.12

*Exam year students' & teachers' CEFR levels*

OPT CEFR	Teachers	Monolingual	Bilingual	Total
B1	0	4	0	4
B2	2	14	7	24
C1	16	19	27	69
C1/C2	1	0	0	0
C2	11	1	10	29
Total	30	38	44	126

Table 4.12 shows the number of students and teachers that have reached the different CEFR proficiency levels. The students' results are from their exam year. The table shows that the majority of the teachers have reached C1/C2, but that 2 teachers have only reached level B2. One teacher scored exactly between level C1 and C2. Teachers who teach in school years 4-6 are expected to reach level C1, but teachers in school years 1-3 may have level B2. As for the students, the majority of students following the monolingual route have level B2/C1 when leaving secondary school. The majority of students following the bilingual route reach level C1, with most of the remainder reaching level C2.

### 4.3.2 Effect of students' CITO scores

Finally, we carried out a number of statistical tests to look at possible correlations between the results and students' CITO scores. This was done with the exam year students' data<sup>1</sup>.

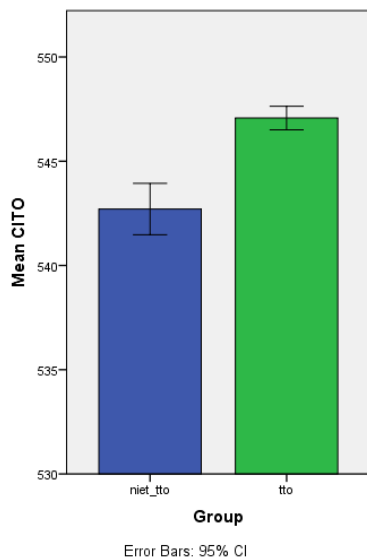


Figure 4.12. Exam year students mean CITO score per experimental group

Fig. 4.12 shows the average CITO score for the monolingual and bilingual exam year students. It shows that the bilingual students, on average, have a significantly higher CITO score than their monolingual counterparts. As the CITO test is one that tests both Mathematics and (Dutch) language skills, it is interesting to see if there are any correlations between students' CITO scores, whether they followed the monolingual or bilingual route, and their exam results for Dutch, English and Mathematics.

The results in Table 4.13 show that there are significant correlations between the different factors. To further explore the relationship between the CITO scores and exam results, we analyzed the difference in exam results between the experimental and control groups and the effect of their CITO scores on these differences, using linear regression. The independent variables were the experimental/control group and the CITO score, the dependent variables were the average exam results per subject. The most important results are shown in Table 4.14.

Without correction for CITO, bilingual students achieved higher results for English (+.795), Dutch (+.267), and Mathematics B (+.467), though this last difference was not significant ( $p=.085$ ). For Mathematics A, bilingual students did not score significantly lower than monolingual students ( $-.078$ ,  $p=.776$ ). Correcting for CITO shows a different pattern. The difference in results for English is smaller but stays significant: bilingual students score higher than monolingual students (+.566). Bilingual students do not score different from monolingual students for Dutch (+.04,  $p=.774$ ) or Mathematics B ( $-.058$ ,  $p=.858$ ). For Mathematics A, the difference becomes larger but is not significant, therefore bilinguals do not score higher or lower than monolinguals ( $-.275$ ,  $p=.34$ ).

<sup>1</sup> Linear mixed models (including fixed effects and Akaike's Information Criterion) were used to test if the same effect of CITO score can be seen in the longitudinal PPVT and OPT data. Though there seems to be some effect, this is not significant.

Table 4.13

*Correlations: Exam year students' experimental group, exam scores & CITO*

		Group	CITO	Dutch	English	Mathematics A	Mathematics B
<b>Group</b>	Pearson Correlation	1	.543**	.230**	.500**	-.076	.241*
	Sig. (2-tailed)		.000	.007	.000	.596	.025
	N	140	120	137	140	51	86
<b>CITO</b>	Pearson Correlation	.543**	1	.330**	.468**	.259	.349**
	Sig. (2-tailed)	.000		.000	.000	.112	.002
	N	120	120	118	120	39	79
<b>Dutch</b>	Pearson Correlation	.230**	.330**	1	.621**	.227	.519**
	Sig. (2-tailed)	.007	.000		.000	.110	.000
	N	137	118	137	137	51	86
<b>English</b>	Pearson Correlation	.500**	.468**	.621**	1	.072	.417**
	Sig. (2-tailed)	.000	.000	.000		.617	.000
	N	140	120	137	140	51	86
<b>Mathematics A</b>	Pearson Correlation	-.076	.259	.227	.072	1	. <sup>c</sup>
	Sig. (2-tailed)	.596	.112	.110	.617		.
	N	51	39	51	51	51	0
<b>Mathematics B</b>	Pearson Correlation	.241*	.349**	.519**	.417**	. <sup>c</sup>	1
	Sig. (2-tailed)	.025	.002	.000	.000	.	
	N	86	79	86	86	0	86

\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

c. Cannot be computed because at least one of the variables is constant.

Table 4.14

*Correcting exam year students' exam scores for CITO score*

	<b>English</b>		<b>Dutch</b>	
	Not Corrected	Corrected	Not Corrected	Corrected
<b>difference: bilingual vs. monolingual</b>	+.795	+.566	+.267	+.040
<b>p</b>	.000	.000	.029	.774
<b>R<sup>2</sup></b>	.26	.312	.201	.110
	<b>Mathematics A</b>		<b>Mathematics B</b>	
	Not Corrected	Corrected	Not Corrected	Corrected
<b>difference: bilingual vs monolingual</b>	-.078	-.275	.467	-.058
<b>p</b>	.776	.34	.085	.858
<b>R<sup>2</sup></b>	.002	.091	.038	.122

## **5. Discussion and Conclusion**

In this thesis I have studied the Dutch and English language development of students following bilingual and monolingual programs in a Dutch secondary school. Over a period of three years, participating students and teachers took the PPVT in English and Dutch, and the Oxford Placement Test. In addition to this test data, we took into account the students' CITO scores and their end-of-school exam results for Dutch, English, and Mathematics. We analyzed the data from three different perspectives: all data, longitudinal individual student data, and exam year students' data. In this chapter I will first summarize the results found in this study, followed by further discussion and the final conclusions.

### **5.1 Summary of results**

#### **5.1.1 All data**

When looking at all the data, we see that both the monolingual and the bilingual students make progress in their PPVT-EN scores, with the bilingual students consistently scoring higher. Monolingual students reach the level of a 10 year old native speaker while the bilingual students reach the level of a 13 year old native speaker. In both groups there is a lot of variation, with a clear overlap between all school years. On average teachers score higher than the students, but there is overlap between the teachers' scores and students' scores from all school years. I will come back to the overlap in students' and teachers' scores further on in this chapter.

As for the PPVT-NL scores, we see that both groups progress, but their progress levels off after their third year. The bilingual group scores only slightly higher than the monolingual group. Both bilingual and monolingual students reach levels above what is expected for their age, which is to be expected for students preparing for university. We see significant within-group variation, but this is less than with the PPVT-EN. On average the teachers score higher than the students. There is some overlap between the teachers' and students' scores, starting from the fourth-year students.

The OPT results show both bilingual and monolingual students making progress over the years, with the bilingual group consistently scoring higher than the monolingual group. With a few exceptions, teachers tested on level C1/C2, as expected. By the time they reach year 6, bilingual students have, on average, reached the same CEFR level as their teachers, though their actual OPT score is slightly lower. By year 6 monolingual students have reached level B2 on average. For both groups there is overlap in scores between all school years and with the teachers' scores.

Overall, students' PPVT-NL scores match their PPVT-EN scores. This is also the case for students' PPVT-EN and OPT scores. There is a strong and significant correlation between the PPVT-NL and PPVT-EN scores and between the PPVT-EN and OPT scores.

#### **5.1.2 Longitudinal data**

Subsequently, we looked at the longitudinal student data, which consists of data from students who were tested multiple times over the three test years. Both the bilingual students' PPVT-EN scores as well as the bilingual and monolingual's OPT scores show that in



general individuals show an increase in scores over time. Statistical analysis with linear mixed models for the PPVT-EN scores and OPT scores showed that there is a significant effect of experimental group and of school year, with scores increasing over the years and bilingual students scoring higher than monolingual students. There is no significant interaction between the two factors: the difference between groups stays the same over the years. For the PPVT-EN the difference between school years decreases over time.

For both the PPVT-EN and the OPT there is an especially small difference between year 3 and year 4, which is the transition point from one group of participants to the other. This transition point also shows up in all the PPVT and OPT data, and may be due to cohort differences or a shift in first-year students' abilities over the years. Further on in this chapter I will come back to this point.

### **5.1.3 Exam year data**

The third perspective from which we analyzed the data was studying only the data from year 6 students. These results show that for the PPVT-NL, the PPVT-EN, and the OPT, bilingual students end up with higher results (on average). This difference is minimal for the PPVT-NL. The end-of-school exam results show a similar pattern. For the subjects Dutch, English and Mathematics B, bilingual students score higher than monolingual students. For Mathematics A however, monolingual students score slightly higher than bilingual students.

Testing for correlations showed that there is a significant correlation between the year 6 students' CITO scores, their exam results, and their test group (bilingual/monolingual). Correcting for students' CITO scores resulted in a different pattern for the exam results. When correcting for CITO scores, there is no significant difference between bilingual and monolingual students' Dutch, Mathematics A or Mathematics B exam results. The difference in exam results for English becomes smaller but does not disappear. This ties in to Verspoor et al.'s (2013) research on bilingual education in HAVO and VWO classes. These are two levels of Dutch education in which students have a different range of CITO scores. Verspoor et al. (2013) conclude that despite this difference bilingual education is as effective for both levels.

## **5.2 Discussion**

### **5.2.1 Monolingual vs. bilingual groups**

Age equivalents for the PPVT results showed at which age level students scored. For the PPVT-EN, monolingual students progress from the level of native speaker 6-year-olds to the level of 10-year-olds. Bilingual students progress from the level of 8-year-olds to the level of 13-year-olds. These results reflect that bilingual students reach a higher level of English, but also that the difference in scores starts from the first year.

The fact that the difference between monolingual and bilingual students is seen starting from the first year reflects the fact that in this study students were not tested right at the beginning of their first year of bilingual education. Therefore, there is no real base measurement of students' level of English when they start secondary school. However in Verspoor et al.'s (2010) study, which is similar to this study, students were tested right at the beginning of the school year. At that point, there was no difference in English language proficiency between students from the monolingual and bilingual group. As both Verspoor et al.'s (2010) study and this study concern students from similar schools in the Netherlands, we

assume that for our participants there was no great difference between the two test groups at the beginning of secondary school either.

As for the age equivalents of the PPVT-NL scores, both the monolingual and bilingual first-year students score as expected for their age. By the time they graduate secondary school, both groups score above average for their age group. As these students follow the highest level of Dutch secondary education, this can be expected. The fact that they do score on average levels in their first year raises the question of the effect of the choice of education level vs. the effect of intelligence on students' achievements. Studying levels of achievement (for example with the PPVT-NL) for students from all levels of education could give more insight in this factor.

### **5.2.2 Teachers' language proficiency**

When considering the teachers' results, we see that on average, they score on the level of 15-year-old native speakers, but their range spans from the level of 9-year-olds to adult native speakers. This differs from their OPT scores and CEFR levels, where most teachers have reached level C1 or C2 (two teachers score on level B2). These results raise two questions. First of all, what level of language proficiency should teachers have to teach in that language? At Varendonck College teachers are required to be at level B2 to teach lower secondary school and level C1 to teach upper secondary classes. Their OPT scores confirm that they have reached these levels. But the PPVT-EN scores call into question if this says enough about their proficiency. This ties into the second question: how much do test results from specific tests such as the PPVT and the OPT say about someone's language ability and their ability to teach in that language? The PPVT is a receptive vocabulary test, while the OPT focuses on grammar and language use. Therefore one could say that someone's skill as measured by the OPT is more significant for using English in an everyday classroom setting. However, one could also argue that a more extensive vocabulary is needed to teach. This could be studied further by taking into account exactly which words are tested in the PPVT and whether they are words needed in a classroom setting.

Both the PPVT and OPT are written tests, which test knowledge of vocabulary, grammar, and use of English. Participants' spoken language proficiency was not tested in this study. Additionally, teachers' have a more extensive knowledge of the subject they are teaching than students' do. It is possible that these two factors compensate for the overlap between teachers' and students' scores in the results measured in this study. The question remains if requiring teachers to have a certain CEFR level says enough about their ability to teach in English. Additionally, as some students reach level C1 in the first three years of secondary school but teachers for those classes are required to have (at least) level B2, should this requirement be reconsidered?

### **5.2.3 Transition between cohorts**

As discussed earlier in this chapter, the transition between the group of students who were tested in years 1-3 and those who were tested in years 4-6 can be seen in the PPVT and OPT results. The difference between the third and fourth year is relatively small, and in some cases a drop in scores can be seen between those years. Additionally, there is quite a lot of overlap in scores between students from the first three years and the second three years.

This effect could be due to a number of reasons. One is that this is simply a difference between two groups of students. As the number of participants is not very large (2-69 measurements per test per year per group), it is possible that in a larger sample this transition between year 3 and 4 would be less significant. Another factor that may have some effect is the moment at which we see this effect. As described in Chapter 3, less subjects are given in English in the last three years of secondary school, due to end-of-school exams being in Dutch. This decrease in everyday use of English may have affected students' English language proficiency.

On the other hand it is possible that first-year students are starting secondary school with a higher level of English proficiency than in earlier years. As Rys et al. (2017) and Gerritsen et al. (2016) write, English is being used more and more in Dutch everyday life. Therefore it can be expected that students who start secondary school have been exposed to more English than their peers a few years ago, resulting in a higher level of English at that age. If this is the case, this has an effect on the teachers: if their students have higher levels of English language proficiency, they may have to increase their own language proficiency to meet their students' needs.

One way to find out more about the transition that we see in these results would be to study one group of students during all six years of secondary school, to make sure that there are no cohort differences.

#### **5.2.4 Aspects of language proficiency**

As mentioned in Chapter 1, this study did not include testing participants' pronunciation or fluency in spontaneous speech as all the tests that were used were written tests. One of the main differences between the monolingual and bilingual education routes is that in the bilingual route students practice their English in everyday classroom settings outside of English class: they practice "genuine communication" (Eurydice, 2006, p.8). It would be interesting to see if this positively affects their pronunciation and fluency in spontaneous speech compared to their peers who mainly use English in the context of English class. When I visited Varendonck College myself, I did observe that the students in bilingual classes easily communicated in English with their teachers and peers in classroom interactions. Further observations or standardized testing could give more insight into their actual fluency and proficiency.

Apart from these two aspects, there is still a clear difference between the monolingual and bilingual group when it comes to English language proficiency. When correcting for CITO score, students following a bilingual education score higher on the PPVT-EN and OPT. They also attain higher results on their English final exams: corrected for CITO the difference with the monolingual group is 0.56 point. Though it is hard to evaluate how significant or substantial this difference is, on the 1-10 grade scale used in Dutch education it still makes quite a difference.

#### **5.2.5 Native vs. non-native**

The PPVT-EN and OPT data show a lot of overlap between the teachers' and the students' scores, while with the PPVT-NL data this overlap is much smaller and only includes the students' in school years 4-6. This shows a difference between first and second language proficiency in both groups. For both groups Dutch is their native language, so it is to be

expected that adults have a higher language proficiency, including vocabulary, than teenagers. However, both groups are still learning English. Though teachers are expected to have a certain level of English, they too are still learning English. Therefore, it is not unusual for students and teachers to have similar levels of English language proficiency.

The CEFR level C2 is sometimes described as native/near-native. By the sixth year of secondary school, almost a quarter (10/44) students and one third of the teachers (11/30) have reached this level (as measured by the OPT). However, according to the PPVT-EN results many of the students and teachers have not reached the level expected of 18-year-olds. This calls into question what we understand under the terms 'native', 'near-native', and 'non-native'. When it comes to language proficiency, what have students actually learned by the time they leave school? What is the real gain of a bilingual education? These are questions that remain to be explored.

### **5.3 Further Research**

Further research could expand on this study by including a number of additional factors. This thesis was part of a larger study at Varendonck College that included a questionnaire on motivation and attitude towards bilingual education. Including this data may shed new light on some of the results. To be able to draw more solid conclusions the study could be repeated at multiple schools, possibly including different levels of secondary education. Extending the study to follow students for the full extent of their six years of secondary school would shed more light on the longitudinal effects of bilingual education. Finally it would be interesting to include more external and background factors such as English language use outside the classroom or family and socio-economic background.

As discussed in earlier chapters, English has an increasingly prominent role in the Netherlands, with English being used more and more in daily life and the number of primary and secondary schools offering Dutch-English bilingual education increasing (de Graaf, 2015). In this study we have not included external factors such as time spent using English outside of class, as the focus was on the language proficiency tests administered. However, taking into account the prominent role of English in (social) media in the Netherlands (Rys et al., 2017), it is very well possible that both the experimental and control groups are exposed to and use English outside of the school setting. The remaining questions are to what extent this is true and whether there is a difference between monolingual and bilingual students in this aspect.

In Chapter 2 I mentioned that one of the discussion points concerning the CLIL education approach is its effect on the students' proficiency in the national language (Eurydice, 2006). The results of this study show that following a Dutch-English bilingual education program using CLIL does not seem to negatively affect the students' Dutch language proficiency. As the participants of this study follow a VWO level education, and are partly selected based on their motivation, this study does not answer the question of whether bilingual education and CLIL should be available for all students.

### **5.4 Issues with the study**

There are a number of possible issues with the data collected. Though it was possible to collect data from a large group of students over multiple years, this data was not always as complete as it was planned to be due to practical issues and restraints. A large group of students was tested only once, or if they were tested multiple times not every test was taken

every time. The data was collected from participants from all school years and from different school levels. However, this was not the case for every test. For example, no second year monolingual students took the PPVT-EN. The data was conducted at one school, which limits the effect of environmental factors. It also means that the sample size is at times quite small. The sample size also differs significantly between groups.

As mentioned in Chapter 2.1, there is some discussion about whether it is possible to compare monolingual and bilingual speakers. From the fractional viewpoint, a bilingual is two monolinguals in one, and it is therefore possible to compare them with a monolingual. From a holistic viewpoint, bilinguals have one unique linguistic profile and it is therefore not possible to compare them to monolinguals (Baker, 2006). However, we are not actually comparing monolinguals and bilinguals here, as the “monolingual” group is also being tested on their second language. We are therefore comparing two groups of bilingual students, who differ in the way they are learning the second language. The two groups do have a different approach to language learning, with the bilingual classes using the CLIL method of learning language through using it in different contexts and the monolingual classes primarily learning English in a foreign language class setting.

## **5.5 Final conclusions**

In the studies conducted by Verspoor et al. (2010; 2013), results showed that the students’ English language proficiency was positively influenced by following a bilingual education stream. The results of this study mirror this, with bilingual students scoring higher (on average) on the English language tests during all school years. This study expands on the research done before by including a test of Dutch language proficiency, to test if Dutch language proficiency is negatively affected by a bilingual education. The results show that, when correcting for students’ CITO scores, students’ Dutch language proficiency is not affected negatively by a bilingual education and bilingual students score on similar levels as their monolingual counterparts.

The three main conclusions of this research can be summarized as follows. First, both the monolingual and bilingual groups progress in their English language learning, with the students following bilingual education reaching a higher level of English. This difference is seen starting from the first school year and stays consistent in all six school years. Second, we can conclude that following a Dutch-English education did not negatively affect the participants’ Dutch language proficiency. When correcting for CITO score, bilingual students score on the same level as monolingual students for the PPVT-NL and their Dutch exams. This is also true for their results in Mathematics. Finally, the results have shown the effect of the CITO score on the language test results.

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