

# **Bilingualism is more than just the sum of two parts**

**The family context of language development in  
ethnic minority children**

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# **Bilingualism is more than just the sum of two parts**

*The family context of language development  
in ethnic minority children*

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# Chapter

# 1

## **General introduction**





## GENERAL INTRODUCTION

All over the world, many children with an immigrant background grow up bilingually, because their ethnic or first language (L1) is different from the language of their host country, their second language (L2). The ethnic language is important for ethnic identity formation and interacting with family members (Oh & Fuligni, 2010), whereas the host language is the language of education for most bilingual children with an immigrant background and is thus important for a successful school career (Davison, Hammer, & Lawrence, 2011; Verhoeven, 2007). Although bilingualism can have certain cognitive advantages (Adesope, Lavin, Thompson, & Ungerleider, 2010), many bilingual children with an immigrant background show less favorable school outcomes compared to their monolingual peers (e.g. Aud et al., 2012; Fleischman, Hopstock, Pelczar, & Shelley, 2010), which may be due to disadvantages in proficiency in the language of education.

Family SES, ethnic constellation of the neighborhood, and the use of child care facilities can directly and indirectly influence language use and development. Bilingual children with an immigrant background are more likely to live in families with a lower socioeconomic status (SES) in which the host language is used less (L. Q. Dixon, Wu, & Daraghmeh, 2012), and home literacy activities are less common (Hindman & Morrison, 2012). In addition, certain language-stimulating activities that are common in Western-European cultures, may be exhibited to a lesser extent or in a different way in immigrant-background families (Bus, Leseman, & Keultjes, 2000; Scheele, Leseman, & Mayo, 2010). These bilingual children are also more likely to live in neighborhoods with higher percentages of immigrants, where they use the ethnic language more (Arriagada, 2005). When children are introduced into childcare services such as playgroups and daycare centers, they start using the host language more (Leseman, 2000), which might also impact the family language use pattern.

The contrasting findings regarding the cognitive advantages of bilingualism and less favorable school outcomes of bilingual children with an immigrant background raise questions about the importance of language proficiency in both languages for school outcomes. Also, the previous findings about the differential language stimulation in immigrant-background families and the effects of family- and community-level factors on language outcomes raise questions about the strength, direction and interconnection of relations between

these contextual factors, language use within these families, and children's language proficiency. The current dissertation aims to answer these questions.

### **Bilingualism**

Over the years, many theories have been proposed and studies have been conducted on the development of bilingual children's two languages. Children infer meaning and language rules from the language input that they are exposed to and build their knowledge of the language on previous and current exposure (Ellis, 2002; Hoff, 2006; Hoff & Naigles, 2002). The relation between input and proficiency is cyclic, with more input leading to increased proficiency and more proficient children in turn inviting more language input (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Pearson, Fernández, Lewedeg, & Oller, 1997; Yeung, Marsh, & Suliman, 2000). However, after a certain *critical mass* of input, more input does not seem to add anything (Pearson et al., 1997; Thordardottir, 2011). The *revised hierarchical model* assumes that children make use of a translational route of language processing in the early phases of L2 development, but that the influence of L1 translation diminishes with increasing L2 proficiency (Sunderman & Kroll, 2006).

The *interdependence hypothesis* (Cummins, 1979) assumes that the development of L2 skills is partly based on the skills already developed in L1. The *interdependence continuum* adds to this hypothesis that interdependence is likely to be stronger for language skills that require less learning challenge (Proctor, August, Snow, & Barr, 2010). Evidence for linguistic interdependence has been shown by several previous studies (e.g., Ordóñez, Carlo, Snow, & McLaughlin, 2002; Proctor et al., 2010; Uccelli & Pérez, 2007; Verhoeven, 2007). Neuroimaging studies also confirm this view. The same neural structures are active in language tasks in L1 and L2 for both low and high proficient bilinguals, although low proficient bilinguals show additional brain activity in the prefrontal areas and basal ganglia that are involved in controlling the languages (Abutalebi, 2008; Buchweitz & Prat, 2013). Regarding the neural representation of concepts, some concepts may be culture-bound and therefore differ in their neural representation in each of the two languages (Buchweitz & Prat, 2013). This is in line with the idea that vocabulary can vary with context (Hoff, 2006; Oller & Eilers, 2002).

Transfer between L1 and L2 can also take the form of the wrongful application of certain language rules or constructions from L1, which will happen

more if languages are typologically more similar and leads to errors in L2 (Kellerman, 1995). As L2 develops further, cross-linguistic influence can become bidirectional (Pavlenko & Jarvis, 2002). According to the *threshold hypothesis* (Cummins, 1979), a certain proficiency level is necessary to avoid negative effects and experience positive effects of bilingualism. In line with this hypothesis, previous research found that cross-language effects occurred only after children had developed sufficient proficiency in both languages (Yeung et al., 2000).

The balance between two languages is not stable over time. If both languages are supported and children acquire proficiency in each of them, this leads to *additive bilingualism*, whereas insufficient attention for ethnic language proficiency and replacement of the ethnic language with the host language is referred to as *subtractive bilingualism* (McCabe et al., 2013). Some bilingual learners will learn both of their languages only to a limited amount and end up in a situation of *semilingualism* (MacSwan, 2000). Many studies have shown that in L2-dominant societies, L1 is the language most at risk for insufficient development (e.g., August et al., 2006; De Houwer, 2007; Mancilla-Martinez & Vagh, 2013). Despite the importance of the ethnic language for parent-child relationships and ethnic identity (Oh & Fuligni, 2010; Phinney, Romero, Nava, & Huang, 2001; Tseng & Fuligni, 2000), internal forces, such as the desire for social inclusion, and external forces, such as sociopolitical forces operating against outsiders, emphasize the importance of the host language for being successful in the host country, and can eventually lead to loss of the ethnic language (Fillmore, 1991, 2000). This loss is generally stronger for younger children and for children whose parents are both born outside the host country (Hakuta & D'Andrea, 1992; Hammer et al., 2012). In line with this shift in proficiency, an increase in their use of the host language over the course of their children's school career can be seen in most bilingual families (Mancilla-Martinez & Kieffer, 2010). The shift towards increased preference of the host language progresses within and across immigrant generations, and is stronger in case of more native peers and a weaker orientation towards the heritage culture (Hakuta & D'Andrea, 1992; Michel, Titzmann, & Silbereisen, 2012).

Proficiency in two languages can have several cognitive advantages. The control of two languages required in bilingualism, enhances the development of more general cognitive skills outside of the language domain (Adesope et al., 2010; Carlson & Meltzoff, 2008). Bilinguals generally show increased attentional

control, inhibition, shifting, flexibility, working memory, and metalinguistic awareness (Adesope et al., 2010; Barac & Bialystok, 2011; Bialystok & Martin, 2004; Bialystok & Viswanathan, 2009; Carlson & Meltzoff, 2008). These cognitive advantages are more likely to occur for early than for late bilinguals (Adesope et al., 2010; Carlson & Meltzoff, 2008) and can, for example, be of advantage in solving mathematical word problems (Kempert, Saalbach, & Hardy, 2011). In addition, neuroimaging studies show that bilinguals have an increased density of grey matter in the left inferior parietal cortex compared to monolinguals, which is related to increased L2 proficiency (Mechelli et al., 2004).

### **Social-contextual correlates of language proficiency in bilingual children**

Several social-contextual factors that can contribute or hinder use and proficiency in the ethnic and the host language have been identified by previous studies. On the level of the family, SES is an important factor that influences children's language proficiency both directly and indirectly. Children from families with a higher SES are generally more proficient in the host language than children from low-SES families (e.g., Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010; L. Q. Dixon, 2011; Golberg, Paradis, & Crago, 2008). The achievement gap between SES groups increases over time (Kloosterman, Notten, Tolsma, & Kraaykamp, 2011). High-SES families use the host language more than the ethnic language, whereas the opposite is true for low-SES families (Pearson, 2007). Language-stimulating activities are conducted more in high-SES families (e.g., Conger & Donnellan, 2007; Crosnoe et al., 2010; Jäkel, Schölmerich, Kassis, & Leyendecker, 2011), and high-SES mothers speak in longer utterances with a richer vocabulary (Hoff, 2003). The financial, human, and social capital available in high-SES families, and the stressors present in low-SES families can explain these SES-based differences in child-directed speech and stimulating activities, and in turn also the differences in child language outcomes (Conger & Donnellan, 2007; Farver, Xu, Eppe, & Lonigan, 2006; Guo & Harris, 2000; Mistry, Biesanz, Chien, Howes, & Benner, 2008).

Another important family-level factor is the language use in the home. Both the quantity and quality of ethnic language use of family members in the home can facilitate children's ethnic language proficiency and development (e.g., Duursma et al., 2007; Hoff & Core, 2013; Mancilla-Martinez & Lesaux, 2011; McCabe et al., 2013). The picture is less clear for host language use and

proficiency, for which some studies found positive relations, provided that parents have sufficient proficiency in the host language (e.g., Becker, 2010; Byers-Heinlein, 2013; Duursma et al., 2007; Mancilla-Martinez & Lesaux, 2011), whereas others found that home exposure to the host language was not related to host language proficiency (Gutiérrez-Clellen & Kreiter, 2003; Hammer, Davison, Lawrence, & Miccio, 2009). If only one parent speaks the ethnic language or both parents are fluent bilinguals, chances decrease that the child receives sufficient ethnic language input from the home environment for proper development of the language (Pearson, 2007). Parents can support their children's language development best when they speak in a language in which they are proficient and talk about objects or topics of interest to the child (McCabe et al., 2013). Language mixing – switching between L1 and L2 or using words from one language when speaking in the other language – is a specific pattern of parental language input that results in smaller vocabularies of the children (Byers-Heinlein, 2013). Furthermore, the amount of language output that a child produces in a certain language is important for proficiency in that language, because a child can practice a language when using it and speaking in the language requires more profound processing than only hearing it (Bohman et al., 2010; Hammer et al., 2012).

Other family-level factors that may be beneficial to children's language development are high parental responsiveness and acceptance, high availability of well-organized and varying learning materials in the home, parents' communication with their children about school-related activities, and personal literacy support (Arriagada, 2005; C.-J. Chen, Hsu, Chu, Han, & Chien, 2012; Duursma et al., 2007). Cognitive stimulation in the home is an essential form of language stimulation that serves as a base for other sources of stimulation to produce an effect (Crosnoe et al., 2010). Home reading is a characteristic of the home environment that is particularly beneficial for monolingual as well as bilingual children's language development within and across languages (e.g., Bus, Van IJzendoorn, & Pellegrini, 1995; Collins, 2010; Farver et al., 2006; Kalia, 2007; Mol & Bus, 2011; Roberts, 2008). Book reading in L2 by parents can compensate for low levels of host language use in the home and parents can use this as a means to prepare their children for schooling in L2 (Kalia & Reese, 2009). Furthermore, parental school involvement, library use and exposure to the host language via TV programs also positively influence host language development (L. Q. Dixon, 2011; Gonzalez & Uhing, 2008; Kloosterman et al., 2011). Besides the

parents, extended family members and other interaction partners can also make valuable contributions to children's ethnic language development (Gonzalez & Uhing, 2008; Place & Hoff, 2011).

On the level of the community, the ethnic language is used more in neighborhoods with higher numbers of immigrants (Arriagada, 2005). The limited host language exposure in such communities is a possible reason for the sharp loss of vocabulary over the summer that language minority students tend to experience (Lawrence, 2012). The SES of the people in the neighborhood can also affect children's expectations and motivation and eventually their educational achievement (Ainsworth, 2002). Also, positive effects of preschool or kindergarten enrollment on host language proficiency have been reported by several previous studies (Silvén & Rubinov, 2010; Uchikoshi, 2006).

Regarding outcomes of language proficiency, within- and cross-language relations between L1 or L2 proficiency and early literacy and reading skills have been found in several previous studies (e.g., Davison et al., 2011; Kalia & Reese, 2009; Proctor, August, Carlo, & Snow, 2006; Verhoeven, 2007). The relation between language proficiency and reading comprehension is mediated by listening comprehension (August et al., 2006). Furthermore, the relation between L1 vocabulary and L2 reading comprehension is stronger for fluent readers, which suggests that L1 skills can be used as a resource in L2 reading comprehension once the reading itself does not require too much cognitive energy (Proctor et al., 2006). L2 proficiency is also related to other school outcomes, such as spelling, math, science, and history (August et al., 2006; Strand & Demie, 2005; Yeung et al., 2000), whereas L1 proficiency is unrelated to these school outcomes (Yeung et al., 2000).

### **Turkish-Dutch bilingual children in the Netherlands**

In the Netherlands, people with a Turkish background form the largest ethnic minority (Central Bureau of Statistics, 2013), and most of them grow up bilingually. In comparison to monolingual Dutch children, Turkish children show delays in language development (Cornips, Van der Hoek, & Verwer, 2006; Verspoor & Cremer, 2008), and a lag in school outcomes that starts in primary school and continues into secondary and later education (Hartgers, 2012). Turkish-background parents might experience difficulties in supporting their children's school careers because of language difficulties or unfamiliarity with the

school system in the host culture (Extra & Yağmur, 2010). Although the gap with native peers is decreasing, Turkish-background children still belong to the ethnic minority groups that are furthest behind in educational level (Hartgers, 2012).

The Turkish language in the Netherlands has a remarkably high vitality (Extra & Yağmur, 2004, 2006). The importance of the Turkish language in ethnic identity contributes to this strong language maintenance (Extra & Yağmur, 2010). However, Turkish language proficiency does not add to psychological adaptation in the Netherlands and use of the Turkish language, even in combination with a high Dutch proficiency, is not widely accepted by the general public in the Dutch society (Vedder & Virta, 2005). The introduction into preschool can propel Dutch vocabulary development of children with a Turkish background, but the early introduction into this all-Dutch environment can at the same time jeopardize the development of the Turkish language (Leseman, 2000).

Turkish-background parents generally read less frequently to their children and interact differently with their children during joint book reading than native mothers, because joint book reading is not part of their traditional cultural repertoire (Bus et al., 2000; Jäkel et al., 2011; Leseman & De Jong, 1998; Scheele et al., 2010). Other oral language activities such as personal conversations, oral storytelling, or undertaking activities outside the home are also less common in Turkish families than in native families (Becker, 2010; Scheele et al., 2010). During joint book reading Turkish mothers are more likely than Dutch mothers to ask their children to repeat or complete sentences, or to focus on the procedure, and less likely to evaluate or extend the narrative, to talk about own experiences, to use the pictures in the book as a support, or to make textual changes (Bus et al., 2000; Leseman & De Jong, 1998). Still, Turkish parents may gradually adopt book reading practices that are common in Western-European cultures (Jäkel et al., 2011). Book reading is less important in the explanation of language and literacy outcomes for bilingual Turkish than for native children (Becker, 2010; Netten, Droop, & Verhoeven, 2011). Besides book reading, there are several other sources of interaction through which parental input in Dutch and Turkish explains differences in Dutch and Turkish proficiency (Scheele et al., 2010).

Both monolinguals and bilinguals are often unaware of the possible advantages of bilingualism and perceive monolingualism as advantageous above bilingualism, which leads to monolingualism being implicitly and explicitly

promoted by society (Agirdag, 2010). Regarding the Dutch situation, a shift in the education for bilingual children can be seen. From 1970, ethnic language instruction was supported in line with the idea that Turkish immigrants would eventually return to their home country, and later on also with goals related to ethnic identity, cognitive heritage, family contacts, and host language learning (Driessen & Van der Grinten, 1994; Extra & Vallen, 1997; Vedder & Virta, 2005). However, in the early 2000s the Dutch political discourse started to change and became more antipluralist, and since 2004 home language instruction is no longer supported by the government (Extra & Yağmur, 2004, 2006; Verspoor & Cremer, 2008). Currently, most schools have an educational model that focuses only on learning Dutch (Extra & Yağmur, 2004, 2006; Vedder & Virta, 2005).

### **Aim and outline of the dissertation**

The overall aim of this dissertation is to unravel the interrelations between social-contextual factors at the family and community level, home language use, bilingual children's language proficiency and their school outcomes. Insight into the relation between language proficiency and school outcomes of bilingual immigrant-background children can provide support as to whether promoting language proficiency can be the key to closing the achievement gap between immigrant-background and native children, and insight into home language use, home literacy environment, and language proficiency in both languages can in turn yield important information on how the language development of these children can be supported and how this support can be tailored to the needs of this specific group. To reach this aim, the following research questions are investigated in this dissertation:

1. How strong and robust are the relations between the oral language proficiency of bilingual children with an immigrant background in both L1 and L2 and the school outcomes of early literacy, reading, spelling, mathematics, and general academic achievement?
2. To what extent is the amount of Dutch and Turkish that mothers use when communicating with their toddlers and the stability or change of that language use over time related to mothers' ethnic identity, the start of child care use, and the ethnic constellation of the neighborhood?



3. To what extent is the relation between SES and vocabulary in both Dutch and Turkish mediated by the language and reading input in the home in each of the languages?
4. To what extent does the interdependence between Turkish vocabulary and Dutch vocabulary growth vary as a result of the contextual factors language use with others and family SES?

To examine the strength, direction and robustness of relations between language proficiency and school outcomes in both L1 and L2 for bilingual children with an immigrant background, a meta-analytical approach is particularly powerful. Our studies with Turkish-Dutch samples can add to the knowledge about language use and proficiency in this ethnic minority group, which is still limited despite the fact that they form the largest ethnic minority in the Netherlands. In addition, the investigation of cross-language relations between oral language proficiency and school outcomes and of the hypothesis of context-dependent linguistic interdependence can add to the theoretical knowledge base in the ongoing discussion and specification of the linguistic interdependence hypothesis (Cummins, 1979).

In Chapter 2, the results of a meta-analytical study on within- and cross-language relations between oral language proficiency and the school outcomes of early literacy, reading, spelling, mathematics, and general academic achievement are presented. In Chapters 3 to 5, factors related to language use and proficiency are further explored in a specific group of immigrant-background children, namely Turkish-Dutch bilingual children in the Netherlands. In Chapter 3, a longitudinal study on maternal language use patterns in Turkish-Dutch families during early childhood and the role of the ethnic constellation of the neighborhood and the use of child care facilities in the change or stability of these patterns is described. For the studies in Chapters 4 and 5, potential predictors of children's vocabulary outcomes in Turkish and Dutch were studied before, during and after the children's transition to formal education. Chapter 4 focuses on the differential pathways from SES to vocabulary in Dutch and Turkish, with maternal language input and home reading input as possible mediating variables. In Chapter 5 the linguistic interdependence between Turkish vocabulary and Dutch vocabulary growth is studied from a context-dependent perspective. Finally, Chapter 6 provides an integration and discussion of the results from the previous

chapters, and an overview of limitations, suggestions for future research, and implications.



# Chapter 2

**Within- and cross-language relations between  
oral language proficiency and school outcomes in  
bilingual children with an immigrant  
background:**

**A meta-analytical study**

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*Manuscript submitted for publication*

## ABSTRACT

A series of sixteen meta-analyses was conducted to examine within- and cross-language relations of bilingual immigrant-background children's oral language proficiency in L1 and L2 with the school outcomes of early literacy, reading, spelling, mathematics and academic achievement. Moderate to strong within-language relations were found for all school outcomes, and cross-language relations for early literacy and reading. Additional meta-analyses showed that within-language relations were stronger than cross-language relations. Our findings were robust, with only six significant moderator effects out of 96 effects tested. Stronger relations were found when vocabulary was used as proficiency measure. Based on our findings, we propose a *task-dependent bidirectional transfer hypothesis*; the strength of cross-language transfer depends on the type of oral language proficiency task and the type of school outcome. Stimulating oral language proficiency in both languages can be a key factor in improving the school outcomes of bilingual children with an immigrant background.

**Keywords:** oral language proficiency, school outcomes, bilingual, immigrant, meta-analysis

## INTRODUCTION

Bilingualism – competence in two languages – is a widespread phenomenon (Edwards, 2004), with the percentage of language minority students in the U.S. expected to increase to 40 percent in 2030 (W. Thomas & Collier, 2002). The number of bilingual children with an immigrant background is increasing worldwide. These children often show less favorable school outcomes compared to their monolingual peers (e.g., Aud et al., 2012; Fleischman, Hopstock, Pelczar, & Shelley, 2010), which may be due to disadvantages in proficiency in the language of education. Several studies with bilingual children with an immigrant background have reported positive associations between language proficiency and the school outcomes of early literacy, reading, spelling, mathematics and general academic achievement in both the first language and the second language (e.g., Atwill, Blanchard, Christie, Gorin, & Garcia, 2010; Bang, Suárez-Orozco, Pakes, & O'Connor, 2009; Barrett, Barile, Malm, & Weaver, 2012; Hammer, Lawrence, & Miccio, 2007; Reynolds & Uhry, 2010), whereas others failed to find these positive associations (e.g., S. Y. Kim & Chao, 2009; Scarpino, Lawrence, Davison, & Hammer, 2011). These associations can differ depending on whether language proficiency and the school outcome are measured for the same language (within-language relations) or for different languages (cross-language relations). Insight in the strength and direction of these relations can add to the theoretical knowledge base on cross- and within-language relations, and inform interventions targeted at bilingual children with an immigrant background to improve their school outcomes. In the current study, a set of meta-analyses on 86 studies including 23,049 children is performed to test the hypotheses that in bilingual children with an immigrant background, oral language proficiency is positively related to school outcomes within and across both the ethnic and the host language, and that within-language relations are stronger than cross-language relations.

All over the world, children with an immigrant background grow up bilingually, because their first language (L1) is different from the language of their host country, their second language (L2). Numbers of immigrants are increasing worldwide, mainly due to labor migration as a result of globalized economic activity (United Nations Population Fund, 2006). In the United States (U.S.), most of the language minority children are Hispanic (Klein, Bugarin, Beltranena, &

McArthur, 2004). In recent years, the number and percentage of Hispanic and Asian students in the U.S. has increased, with Hispanic students now covering 23 percent of the total school enrollment (Aud et al., 2012). The percentage of language minority students in the U.S. is expected to increase to 40 percent in 2030 (W. Thomas & Collier, 2002). The increasing flow of immigrants is also one of the main factors behind multilingualism in European countries (Tabouret-Keller, 2004). Overall, 12% of the inhabitants of the 27 countries of the European Union (EU) are first-generation and 5% second-generation migrants (Eurostat, 2011). These migrants are likely to be language minorities in their host countries. In Canada, 20 percent speaks a language other than English or French, with most of the language minorities speaking a Chinese language (Statistics Canada, 2006).

Several studies have shown that bilingual children generally perform better than monolingual children on executive control tasks, working memory, metalinguistic awareness, abstract and symbolic representation skills, and spatial perspective-taking (Adesope, Lavin, Thompson, & Ungerleider, 2010; Barac & Bialystok, 2012; Bialystok, 2007; Greenberg, Bellana, & Bialystok, 2013; Poulin-Dubois, Blaye, Coutya, & Bialystok, 2011). The need to switch between two languages is thought to be responsible for these cognitive advantages. Brain areas related to cognitive control are also engaged in L2-related brain activity (Abutalebi, 2008). The advantages can differ dependent on the degree of balanced bilingualism and the age of onset of bilingualism (Bialystok & Barac, 2012; Luk, De Sa, & Bialystok, 2011). The cognitive skills in which bilinguals generally excel, might support them in their academic performance (Best, Miller, & Jones, 2009; Yeniad, Malda, Mesman, Van IJzendoorn, & Pieper, 2013). However, despite the cognitive advantages of bilingualism, most bilingual children with an immigrant background generally score lower on standardized reading and math assessments (Aud et al., 2012; Entorf & Minoiu, 2005; Fleischman et al., 2010), and are more likely to have repeated a grade or drop out of high school (Child Trends Data Bank, 2012, 2013). This disadvantage in school achievement can be partly explained by the less favorable socioeconomic status (SES) of many immigrant families. Asian-American students are an exception, both in terms of achievement as well as of SES, because they generally score higher than their monolingual counterparts on standardized assessments and their families' SES is comparable to that of native families (Aud et al., 2012; C. Chen & Stevenson, 1995; Fleischman et al., 2010). For bilingual children with an immigrant background, the possible

cognitive advantages of bilingualism apparently do not outweigh their less favorable position in education compared to their monolingual counterparts.

In addition to differences in academic achievement between bilinguals and monolinguals, there is also substantial variation within bilingual groups. Children's oral language proficiency – their proficiency in speaking and understanding spoken language (in their L1 or L2) – is one of the variables related to these achievement differences. Previous research with bilingual children has shown that oral language proficiency is positively related to the early literacy skills of phonological awareness, letter knowledge, and early awareness of literacy concepts (e.g., Atwill et al., 2010; Dickinson, McCabe, Clark-Chiarelli, & Wolf, 2004; Hammer & Miccio, 2006), and to reading (e.g., Marx & Stanat, 2012; Melby-Lervåg & Lervåg, 2011), spelling (e.g., Abu-Rabia & Siegel, 2002; Reynolds & Uhry, 2010), mathematics (e.g., Barrett et al., 2012; Kleemans, Segers, & Verhoeven, 2011), and general academic achievement (e.g., Garnett, 2012; Hoff, 2013). However, some studies found no relation of oral language proficiency with these school outcomes (e.g., Abu-Rabia, 1999; Buriel & Cardoza, 1988; Durgunoğlu, Nagy, & Hancin-Bhatt, 1993; S. Y. Kim & Chao, 2009).

Furthermore, there are also studies that found negative effects of L1 proficiency on school outcomes (e.g., Liu, Benner, Lau, & Kim, 2009; Scarpino et al., 2011; Swanson, Rosston, Gerber, & Solari, 2008). The effects of oral language proficiency in L1 or L2 on school outcomes can differ depending on whether the outcome measure is in the same language or the other language. According to the *interdependence hypothesis* (Cummins, 1979), L1 competence positively relates to L2 competence, because competence in L2 is partly based on competence in L1. In other words, cross-language transfer takes place. More recently, an *interdependence continuum* (Proctor, August, Snow, & Barr, 2010) has been suggested, in which the strength of the interdependence is hypothesized to be dependent on the resemblance in languages and the type of L1 and L2 skills. This idea of interdependence between languages is confirmed by neuroimaging studies, in which the same neural structures (particularly the left inferior frontal gyrus and superior temporal gyrus) were found to be responsible for both L1 and L2 processing (Abutalebi, 2008; Buchweitz & Prat, 2013). However, according to the *threshold hypothesis* (Cummins, 1979), L1 proficiency has to be of a sufficient level for this positive transfer to take place. Neuroimaging studies have also shown that the similarity in brain activation between L1 and L2 was higher for

more proficient bilinguals (Buchweitz & Prat, 2013). In addition, the *script-dependent hypothesis* (Geva & Siegel, 2000; Ryan & Meara, 1991) assumes that the type of errors made in L2 are influenced by L1 and dependent on the degree of similarity between the scripts of the two languages. Furthermore, the relation between oral proficiency in one language and school outcomes in the other language could also take the form of *subtractive bilingualism*, which refers to learning L2 skills at the expense of L1 skills (Butler & Hakuta, 2004).

In North-America as well as in Europe, language education policies have frequently changed, and it is still subject of debate whether the ethnic language should be incorporated in education or whether the focus should be on education in and of the host language (Mackey, 2004; Tabouret-Keller, 2004). Insight in the strength and directions of the relation between proficiency in L1 and L2 and school outcomes in both languages can inform future decisions on language policies. A meta-analytic approach is particularly powerful to examine the relations between language proficiency and school outcomes in both L1 and L2 for bilingual children with an immigrant background, and the potential moderators of these relations. In addition, meta-analyses in which within- and cross-language relations between oral proficiency and school outcomes are compared, can add to the theoretical knowledge base on interdependency between two languages in bilinguals and the generalizability of these findings to different samples of bilingual children with an immigrant background.

### **Moderators**

Divergent findings between studies regarding the relation between language proficiency and school outcomes may result from differences in sample and procedural characteristics, that therefore need to be tested as moderators in the meta-analyses. Relevant sample characteristics that could serve as potential moderators include SES, whether or not it is a Spanish sample in the U.S., immigrant generation, gender, age or grade level, and L1 education.

Immigrant-background families are more likely than native families to have a low SES or live in poverty (Aud et al., 2012), though the magnitude and direction of this SES difference is dependent on their immigration history (Entorf & Minoiu, 2005). There is evidence that part of the difference in school outcomes between bilingual children with an immigrant background and monolingual non-migrant children – the achievement gap – can be accounted for



by SES (Barrett et al., 2012; Glick & Hohmann-Marriott, 2007; Hammer & Miccio, 2006). However, the influence of SES on school performance has been shown to differ strongly between countries (Entorf & Minoiu, 2005), and the achievement gap does not always disappear when SES is controlled for (Marx & Stanat, 2012).

Most of the studies in which the relation between language proficiency and school outcomes was investigated have been conducted with Hispanic children in the U.S., which is not surprising given the (increasing) size of this immigrant background group (Aud et al., 2012; Klein et al., 2004). Findings of these studies cannot be generalized to other bilingual samples in other countries without caution, because countries differ in their immigration policies and history (Entorf & Minoiu, 2005). In addition, Spanish and English are orthographically comparable. In accordance with the *script-dependent hypothesis* (Geva & Siegel, 2000; Ryan & Meara, 1991) studies with Spanish-English bilinguals might therefore show different outcomes than studies with other L1-L2 combinations that show less resemblance in their orthographies.

Regarding the immigrant generation that children belong to, one might expect that the gaps in academic achievement are smaller for children from later immigrant generations. However, there is an *immigrant paradox*, referring to the phenomenon that the achievement gaps with monolingual peers widen for later generations. Paradoxical associations between length of residence or immigrant generation and adjustment outcomes have been found in several domains, and SES-related stressors and segregation into low-SES schools and neighborhoods might play a role in that paradox because these SES effects are more pronounced in later generations (Fuligni, 1998; Suárez-Orozco, Rhodes, & Milburn, 2009). First- and second-generation youth are more likely to complete secondary school than their peers from third or later immigrant generations (Glick & White, 2004). Second-generation students are less motivated to work hard for school success than their first-generation peers (Kaufman, 2004).

The framework of the Simple View of Reading (Hoover & Gough, 1990) suggests that the importance of language proficiency for reading increases in later grades, when the focus of reading instruction moves from word recognition to comprehension. The same might be true for other school outcomes, for which the importance of language proficiency might increase with increasing linguistic complexity of the educational instructions and tasks and the effects might thus be moderated by age or grade level.

The effects of language proficiency on school outcomes might be related to whether or not the child receives some form of L1 education. L2 proficiency has been shown to be positively influenced by monolingual as well as two-way immersion programs, whereas L1 proficiency fares better in a two-way immersion or transitional bilingual program (Barnett, Yarosz, Thomas, Jung, & Blanco, 2007; Slavin, Madden, Calderón, Chamberlain, & Hennessy, 2011).

Procedural characteristics that are relevant to test as potential moderators in the meta-analyses of the relations between oral language proficiency and school outcomes, include the language proficiency measure, the type of language proficiency, language modality, type of school outcome (early literacy, reading, spelling, mathematics, or general academic achievement), the outcome measure, and the type of early literacy, reading or spelling that is measured. We expect that the relation between oral language proficiency and school outcomes is stronger for proficiency measures that show larger resemblance to the skill measured in the outcome, and for outcome measures that are more language-related, such as early literacy, reading and spelling (as opposed to mathematics and general academic achievement).

### **Hypotheses**

In sum, bilingual children with an immigrant background show less favorable school outcomes, despite the possible cognitive benefits of bilingualism. Oral proficiency in both L1 and L2 might have an effect on these children's school outcomes, but the strength and direction of these effects might be different for L1 and L2. In addition, whether these effects are also present across (rather than within) different languages needs further investigation. In this study we synthesize the available findings on the relation between oral language proficiency and school outcomes of bilingual children with an immigrant background by means of meta-analyses. We aim to test the following hypotheses:

- (1) L1 and L2 oral language proficiency are positively related to school outcomes measured in the same language (within-language relations).
- (2) There are positive cross-language relations between L1 or L2 oral language proficiency and school outcomes.
- (3) Relations are expected to be stronger when the sample is larger, when SES is higher, when respondents are from an earlier immigrant generation,

and when respondents are older. Also, relations are expected to be stronger when L1 is also incorporated in education, when the proficiency measure shows higher resemblance to the skill measured in the outcome, and when the outcome measure is more language-related. The potential moderating effects of whether or not it is a Spanish-English sample in the U.S., gender, publication year, and use of covariates will be tested in an exploratory way.

- (4) The strengths of L1 and L2 within-language relations between oral language proficiency and school outcomes are similar.
- (5) The strengths of L1-L2 and L2-L1 cross-language relations between oral language proficiency and school outcomes are similar.
- (6) Within-language relations between oral language proficiency and school outcomes are stronger than cross-language relations.

## METHOD

### Literature search

To identify relevant studies, we searched the electronic databases Web of Science, ERIC, and PsycINFO by using the keywords immigrant, bilingual\*, “second language learn\*”, “dual language learn\*”, multilingual\*, “foreign language learn\*” combined with “language proficiency”, “language fluency”, “verbal fluency”, “language development”, “language ability”, “language skill\*”, lexic\*, vocabulary, grammar, syntax, semantics, “language competenc\*”, “language acquisition”, “language knowledge”, “language attainment”, “language learning”, “language achievement”, “language score”, “verbal score”, “language performance”, “expressive language”, “receptive language”, “language outcome”, “language grade”, “oral expression”, “language progress”, and with child\*, infan\*, adolescen\*, toddler, preschooler, baby, babies, youth. To exclude articles concerning children bilingual in sign language and a spoken language, we added NOT “sign OR gesture”. This search was finalized in August 2013. In addition, we checked the reference lists of the collected articles and of relevant review articles (August et al., 2006; Bialystok, 2007; Costigan et al., 2010; Figueredo, 2006; Garnett, 2012; Hammer & Miccio, 2006; Hoff, 2013; Kristen et al., 2010; Marx & Stanat, 2012; Schmid, 2001; Sheng et al., 2011) and a meta-analysis (Melby-Lervåg & Lervåg, 2011) for relevant studies.

Studies were included if they reported on the relation between oral language proficiency and any type of school outcome in a sample of bilingual children with an immigrant background. The following inclusion criteria were used: (1) the study was reported in a journal article written in English; (2) respondents had a maximum mean age of 18 years; (3) respondents had an immigrant background (studies with, for example, adoptees, returnees, or children living in a bilingual area were excluded); (4) respondents were bilingual, and outcome data were available specifically for the bilingual (sub)sample; (5) respondents were developing typically (studies with children with, for example, dyslexia, specific language impairment, or learning disabilities were excluded); (6) the child's oral receptive and/or expressive language proficiency in their first language (L1), second language (L2) or both, was analyzed as a predictor of one or more school outcomes, or both constructs were measured concurrently. To make sure that the inclusion criteria could be interpreted unambiguously, 50 articles were assessed for eligibility by two raters in each phase of the screening process (screening of abstracts and screening of full-texts). In case of disagreement, the coders discussed and reconsidered the criterion to get to a full consensus on the in- or exclusion of these 100 articles.

We found 95 studies reported in 98 articles that met our search criteria. However, nine of these studies (from 10 articles) could not be included in our meta-analyses, because they did not report usable effect size data (see Figure 1). The studies included in the meta-analyses had sample sizes ranging from 19 to 2843. Eighty-six studies provided a total of 320 correlations for various within- or cross-language relations of several of the school outcomes early literacy skills, reading, spelling, math, and general academic achievement to be used in the meta-analyses. Fourteen studies provided only early literacy outcomes, 27 only reading outcomes, two only spelling, three only math, and four only academic achievement. All other studies provided results on several school outcomes. Overall, 41 studies reported on oral proficiency and early literacy ( $N = 4589$ ), 61 on oral proficiency and reading ( $N = 18820$ ), nine on oral proficiency and spelling ( $N = 1405$ ), nine on oral proficiency and math ( $N = 6811$ ), and nine on oral proficiency and general academic achievement ( $N = 5094$ ).

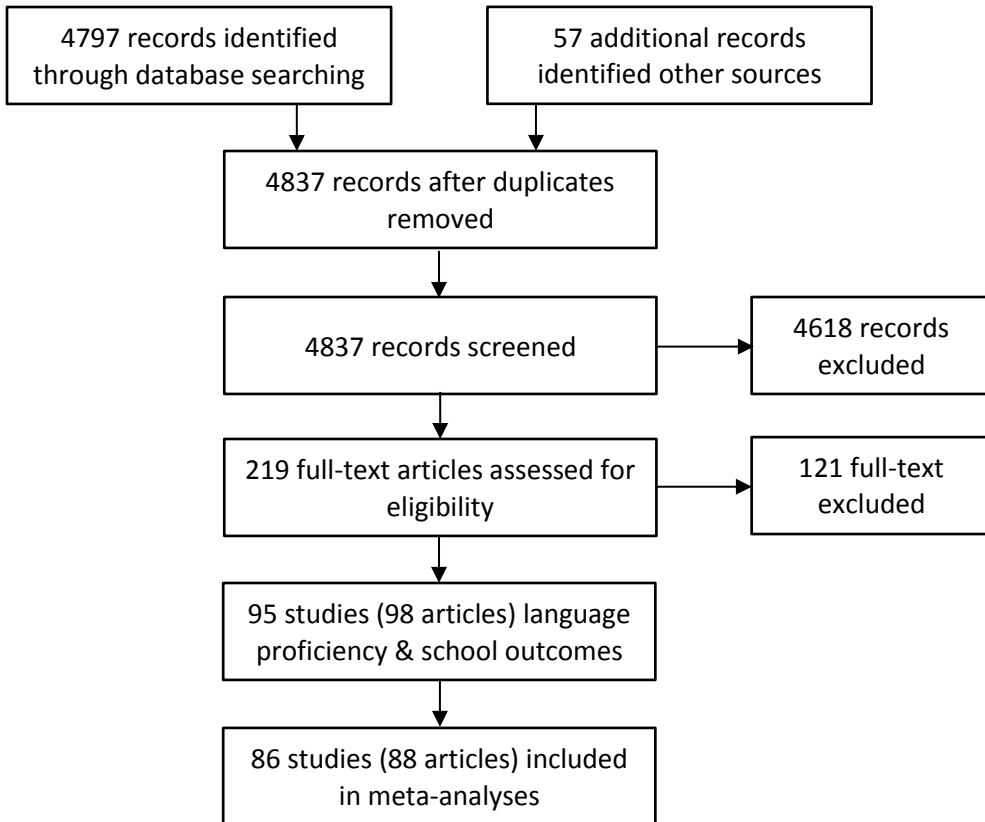


Figure 1. Flow chart of literature search and selection

**Moderators**

The coding scheme for characteristics of studies, samples, predictors and outcomes is presented in Table 1. For each scale a minimum of 20 studies (23%) were coded by two coders to assess intercoder reliability. Cohen’s kappa was computed for categorical variables, and intraclass correlations for continuous variables. The average agreement was .96 (range .88-1.00) for both the categorical and the continuous variables.

Two types of moderators were coded: sample and procedural characteristics. Sample moderators included sample size, SES, whether or not the sample consisted of Spanish-English bilinguals in the U.S., L1 education, immigrant generation, gender, and age or grade level at the first measurement.

Table 1. *Coding system for studies on language proficiency and school outcomes*

<b>Variable</b>	<b>Codes</b>	
<u><i>Sample characteristics</i></u>		
Sample size	<i>N</i> of total bilingual sample	
SES	1 = predominantly low SES 2 = other	3 = unclassifiable
Spanish-English U.S. sample?	0 = no	1 = yes
L1 education	1 = ≥ 75% separate L1 classes 2 = ≥ 75% bilingual/transitional program	3 = ≥ 75% L2 immersion 4 = unclassifiable
Immigrant generation	1 = ≥ 75% first 2 = ≥ 75% second or later	3 = unclassifiable
Gender	1 = ≥ 75% female 2 = ≥ 75% male	3 = unclassifiable
Age/grade level	1 = preschool/kindergarten (0-6 yrs.) 2 = grades 1-3 (6-9 yrs.)	3 = grades 4-8 (9-14 yrs.) 4 = grades 9-12 (14-18)
<u><i>Procedural characteristics</i></u>		
Publication year	Year in which the paper was published	
Use of covariates	0 = zero-order correlations	1 = partial correlations/regression
Measurement of language proficiency	1 = tested 2 = self-reported	3 = teacher-reported
Type of language proficiency	1 = vocabulary 2 = grammar/syntax/morphology	3 = general proficiency*
Language modality	1 = receptive 2 = expressive	3 = both
Type of outcome	1 = early literacy skills 2 = reading 3 = spelling	4 = mathematics 5 = academic achievement
Measurement of outcome	1 = tested 2 = school grade	3 = both
Type of early literacy (if relevant)	1 = phonological skills 2 = letter knowledge	3 = early awareness of literacy concepts 4 = general early literacy*
Type of reading (if relevant)	1 = (pseudo)word reading 2 = reading comprehension	3 = general reading score*
Type of spelling (if relevant)	1 = receptive 2 = expressive	3 = both
Cross-/within-language relation	1 = L1-L1 2 = L2-L2	3 = L1-L2 4 = L2-L1

\*general measures are measures that used a combination of aspects of the overall construct, or were based on a combined effect size of different specific measures of the overall construct

Initially, we also coded whether L1 had the same or a different script as L2 or whether a combination of various L1s was present in the sample. However, because the subcategories for this variable were too small, we decided to combine this variable with L2 and the country of origin into one variable indicating whether the study used a Spanish-English bilingual sample in the U.S. Procedural moderators included publication year, use of covariates, measurement of language proficiency, type of language proficiency, language modality, type of outcome, measurement of outcome, type of early literacy (if relevant), type of reading (if relevant), type of spelling (if relevant), cross-/within language relations. These procedural characteristics were coded separately for each combination of predictor and outcome variables. Outliers of continuous moderator variables were winsorized to be one higher than the next highest value or one lower than the next lowest value of the particular variable (W. J. Dixon, 1960).

### **Statistical analyses**

Using the program Comprehensive Meta-Analysis (CMA) (Borenstein, Rothstein, & Cohen, 2005), a total of 16 meta-analyses were performed for all possible within- and cross-language relations for each of the five school outcomes. In addition, the differences between correlations across and within L1 and L2 were also meta-analyzed for each school outcome. An overview of all these analyses is provided in Figure 2. For each cross- or within-language relation of each school outcome, an effect size (correlation) was computed. For the additional analyses of the differences between correlations, the standardized differences ( $d$ ) were computed for each school outcome as effect size to compare within- and cross-language relations in one language with the same relations in the other language, and to compare within-language relations with cross-language relations.

For studies that reported a non-significant finding without providing the exact statistics, a conservative non-significant zero effect size was used (Mullen, 1989). For studies that reported several correlations for one cross- or within-language relation between language proficiency and a school outcome, combined effect sizes were computed using CMA. Random effect models were used as the mode of analysis for significance tests and moderator analyses (Borenstein, Hedges, & Rothstein, 2007). Random effect models allow for random differences between studies because of variations in procedures, measures, or settings, that

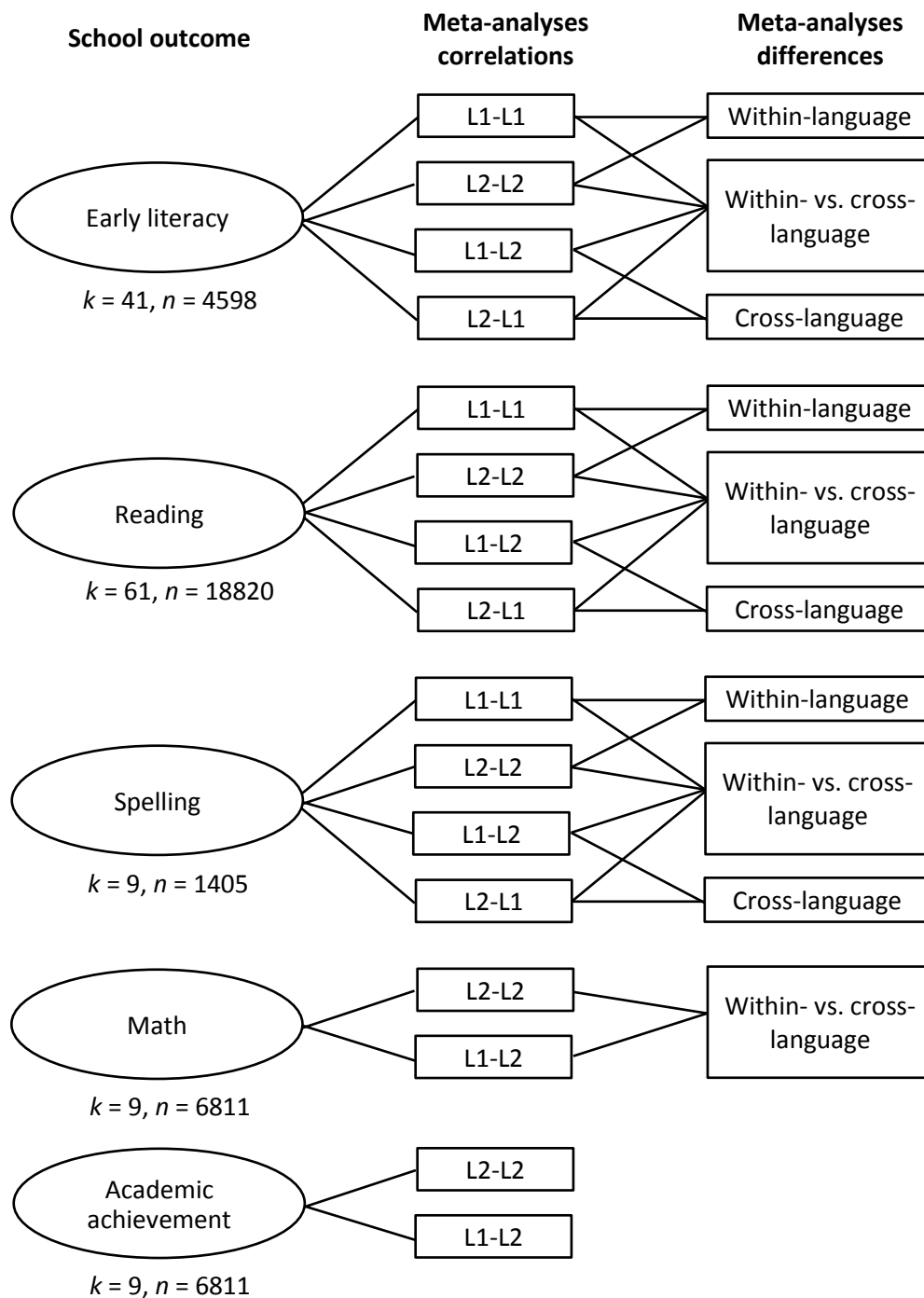


Figure 2. Overview of meta-analyses



go beyond sampling errors on the subject level (Lipsey & Wilson, 2001). *Q*-statistics were computed to test the homogeneity of effect sizes (Borenstein et al., 2005). Also, 95% confidence intervals (CIs) were computed for all effect sizes. To test the influence of possible adjustments of the sample for publication bias, the trim and fill method was used (Duval & Tweedie, 2000).

To assess differences between effect sizes for specific subsets grouped by moderators, *Q*-statistics and their *p*-values were computed. Contrasts were only tested when at least two of the subsets consisted of at least four studies (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003). Therefore, type of measurement of language proficiency and of school outcomes could not be tested as moderators. Furthermore, for moderators that had a category 'unclassifiable', this category was not included in moderator analyses. As a result, gender could not be tested as a moderator.

## RESULTS

### Language proficiency in relation to early literacy and reading

The results of the meta-analyses for within-language relations between language proficiency and early literacy are presented in Table 2, and the results for cross-language effects in Table 3. Overall, there were moderate within-language correlations for both L1 and L2 between language proficiency and early literacy ( $.33 < r < .37$ ), which corroborates Hypothesis 1 for this outcome. The cross-language correlations were weaker ( $.21 < r < .22$ ), though still significant. Hypothesis 2 is thus also confirmed for early literacy. Regarding the moderators listed in Hypothesis 3, type of proficiency was a significant moderator for L1 within-language and L1-L2 cross-language relations, with studies in which vocabulary was used as language proficiency measure showing a stronger correlation than studies in which a general language proficiency measure was used. No other moderator effects were significant.

The results of the meta-analyses for within-language relations between language proficiency and reading are presented in Table 4, and the results for cross-language effects in Table 5. Overall, there were strong within-language correlations for both L1 and L2 between language proficiency and reading ( $r = .40$ ), which is a confirmation of Hypothesis 1 for this outcome. The cross-language correlation from L1 to L2 was weaker ( $r = .12$ ), though still significant,

whereas there was no significant effect of L2 proficiency on L1 reading ( $r = .07$ ), so Hypothesis 2 only partly holds true. Regarding the moderators from Hypothesis 3, L1 education was a significant moderator of the L2 within-language relation between oral proficiency and reading, with a less strong correlation for children in L2 immersion compared to children following separate L1 classes or a bilingual or transitional education program. Also, the within-language correlations between oral proficiency and reading were higher with increasing age, as shown by the significant moderator effect of age or grade level for these relations. For the L1 within-language relation, type of reading was also a significant moderator, with a less strong effect in studies in which (pseudo)word reading was used as reading proficiency measure compared to studies that measured reading comprehension. None of the other moderator effects were significant.

In Figure 3 the correlations of oral language proficiency with early literacy and reading and the 95% confidence intervals of these correlations are presented. The outcomes of the trim and fill procedure (Duval & Tweedie, 2000) showed no indication for publication bias.

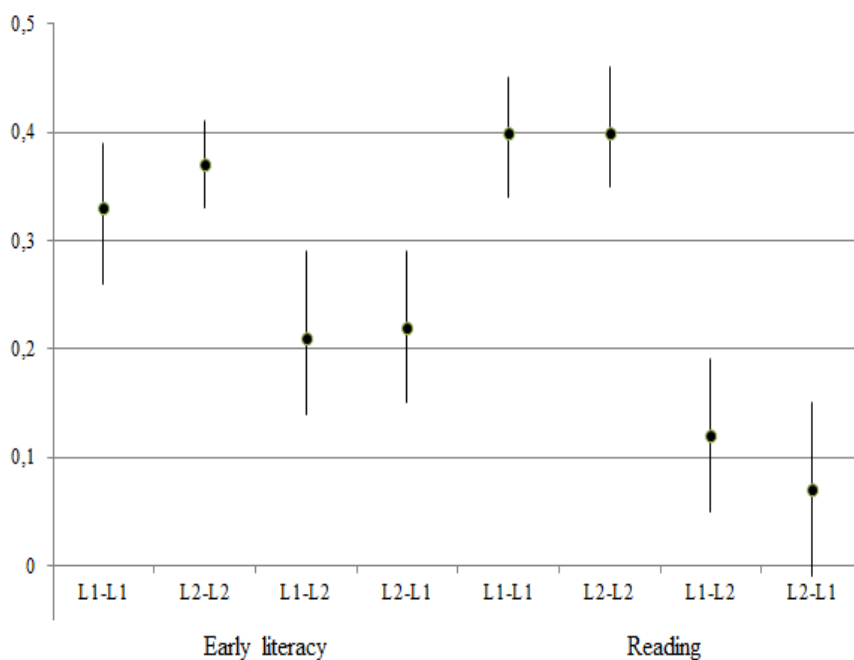


Figure 3. Correlations and 95% CIs of oral proficiency with early literacy and reading for each combination of languages

Table 2. Meta-analytic results of studies of within-language relations between oral proficiency and early literacy

	L1 relations					L2 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>
<b>Total set</b>	25	2704	.33**	.26-.39	71.96**	42	4075	.37**	.33-.41	76.90**
<i>Sample characteristics</i>										
SES <sup>c</sup>										1.81
Low						27	2808	.38**	.34-.43	
Other						4	382	.30**	.17-.43	
Unclassifiable						11	885	.36**	.27-.44	
Spanish-English US					0.83					0.12
No	9	482	.37**	.26-.48		21	1604	.36**	.30-.42	
Yes	16	2222	.31**	.23-.38		21	2471	.38**	.32-.43	
L1 education <sup>d</sup>					1.68					2.52
Separate classes	6	345	.42**	.28-.54		7	449	.43**	.32-.52	
Bilingual/transitional	6	980	.32**	.19-.43		9	1061	.36**	.27-.45	
L2 immersion	5	472	.29**	.15-.42		9	964	.32**	.24-.40	
Unclassifiable	8	907	.30**	.18-.42		17	1601	.39**	.32-.45	
Immigrant generation <sup>c</sup>										0.92
First						8	606	.41**	.31-.50	
Second or later						10	1135	.33**	.25-.42	
Unclassifiable						24	1708	.37**	.32-.43	
Age/grade level <sup>d</sup>					0.01					0.46
Preschool/kindergarten	17	2212	.31**	.23-.38		17	1533	.39**	.33-.45	
Grades 1-3	5	336	.32**	.17-.46		20	2153	.36**	.31-.42	
Grades 4-8						4	329	.39**	.25-.51	
<i>Procedural characteristics</i>										
Use of covariates <sup>c</sup>										0.05
Zero-order correlations						38	3600	.37**	.33-.42	
Partial corr./regression						4	475	.36**	.24-.47	
Type of proficiency <sup>e</sup>					13.40**					0.79
Vocabulary	12	1238	.40**	.33-.47		19	1871	.38**	.33-.43	
General proficiency	10	1310	.19**	.11-.28		20	2048	.35**	.30-.40	
Language modality					0.38					1.87
Receptive	11	1082	.32**	.21-.41		14	1181	.33**	.26-.40	
Expressive	4	655	.37**	.21-.52		7	1083	.40**	.32-.48	
Both	10	967	.33**	.21-.43		21	1811	.38**	.32-.43	
Type of early literacy <sup>f</sup>					0.00					0.00
Phonological skills	20	1744	.32**	.25-.39		29	2565	.37**	.32-.42	
General early literacy	4	932	.32**	.17-.45		10	1112	.37**	.29-.45	

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup>  $Q$ -statistic for total set stands for homogeneity ( $df = k - 1$ ),  $Q$ -statistic for moderator for effect of contrasts ( $df = \text{number of subgroups} - 1$ )

<sup>b</sup> For moderators that have a category 'unclassifiable', the  $Q$ -statistic reported in this table does not include the unclassifiable category

<sup>c</sup> SES, immigrant generation, and use of covariates could not be tested as a moderator for L1 relations, because group sizes were too small

<sup>d</sup> Studies from grades 4-8 excluded in analysis of L1 relations, from grades 9-12 excluded in both analyses

<sup>e</sup> Studies that used grammar/syntax/morphology as language proficiency indicator excluded

<sup>f</sup> Studies with letter knowledge as early literacy measure excluded

Table 3. Meta-analytic results of studies of cross-language relations between oral proficiency and early literacy

	L1-L2 relations					L2-L1 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>
<b>Total set</b>	28	2726	.21**	.14-.29	100.55**	18	1617	.22**	.15-.29	32.72*
<i>Sample characteristics</i>										
SES <sup>c</sup>					0.05					
Low	19	2022	.22**	.13-.31						
Other	4	259	.25*	.03-.44						
Unclassifiable	5	445	.17	-.02-.34						
Spanish-English U.S.					1.17					0.03
No	10	669	.27**	.14-.39		7	397	.21**	.09-.34	
Yes	18	2057	.18**	.09-.28		11	1220	.23**	.14-.31	
L1 education <sup>d</sup>					2.06					0.89
Separate classes	7	482	.30**	.14-.45		5	285	.24**	.09-.38	
Bilingual/transitional	6	647	.18	-.01-.35						
L2 immersion	7	635	.13	-.03-.29		4	387	.17*	.02-.31	
Unclassifiable	8	962	.24**	.09-.37		7	882	.22**		
Immigrant generation <sup>c</sup>					0.18					
First	5	375	.25**	.06-.43						
Second or later	5	643	.19	-.01-.37						
Unclassifiable	18	1708	.21**	.11-.31						
Age/grade level <sup>e</sup>					1.21					2.97
Preschool/kindergarten	15	1848	.23**	.14-.31		11	1185	.24**	.16-.32	
Grades 1-3	10	722	.15*	.04-.26		4	276	.09	-.06-.24	
<i>Procedural characteristics</i>										
Type of proficiency <sup>f</sup>					10.87**					1.47
Vocabulary	13	1318	.29**	.22-.37		9	678	.25**	.15-.34	
General proficiency	12	1252	.10*	.02-.19		6	783	.16**	.04-.27	
Language modality <sup>g</sup>					1.58					0.34
Receptive	9	668	.24**	.11-.37		7	520	.24**	.12-.34	
Expressive	4	710	.29**	.11-.46						
Both	15	1348	.17*	.06-.27		10	967	.19**	.10-.28	
Type of early literacy <sup>c,h</sup>					0.06					
Phonological skills	19	1456	.24**	.15-.32						
General early literacy	8	1182	.22*	.09-.34						

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup> *Q*-statistic for total set stands for homogeneity ( $df = k - 1$ ), *Q*-statistic for moderator for effect of contrasts ( $df = \text{number of subgroups} - 1$ )

<sup>b</sup> For moderators that have a category 'unclassifiable', the *Q*-statistic reported in this table does not include the unclassifiable category

<sup>c</sup> SES, immigrant generation, and type of early literacy could not be tested as moderators for L2-L1 relations, because group sizes were too small

<sup>d</sup> Studies with bilingual/transitional programs excluded in analysis of L2-L1 relations

Use of covariates could not be tested as a moderator, because group sizes were too small

<sup>e</sup> Studies from grades 4-8 and grades 9-12 excluded

<sup>f</sup> Studies that used grammar/syntax/morphology as language proficiency indicator excluded

<sup>g</sup> Studies with expressive proficiency measure excluded in analysis of L2-L1 relations

<sup>h</sup> Studies with early concepts of print as early literacy measure excluded

Table 4. Meta-analytic results of studies of within-language relations between oral proficiency and reading

	L1 relations					L2 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a,b</sup>
<b>Total set</b>	34	5372	.40**	.34-.45	142.68**	59	16008	.40**	.35-.46	839.46**
<i>Sample characteristics</i>										
SES					0.82					2.78
Low	20	2446	.37**	.30-.44		34	7597	.38**	.31-.44	
Other	8	2583	.31**	.20-.42		13	4333	.47**	.36-.56	
Unclassifiable	6	343	.62**	.50-.71		12	4078	.40**	.28-.51	
Spanish-English U.S.					0.09					0.06
No	11	1872	.41**	.31-.51		28	9994	.41**	.33-.48	
Yes	23	4671	.39**	.33-.46		31	6014	.40**	.32-.47	
L1 education					0.72					10.44**
Separate classes	9	589	.45**	.33-.55		10	600	.46**	.33-.58	
Bilingual/transitional	13	3667	.39**	.30-.48		15	3923	.47**	.37-.56	
L2 immersion	7	512	.41**	.27-.52		18	5711	.30**	.20-.40	
Unclassifiable	5	604	.33**	.17-.47		16	5774	.42**	.31-.51	
Immigrant generation					0.55					0.87
First	4	318	.45**	.29-.58		9	1856	.46**	.32-.59	
Second or later	7	465	.36**	.23-.48		16	5204	.38**	.27-.48	
Unclassifiable	23	4589	.40**	.33-.46		34	8948	.40**	.33-.47	
Age/grade level <sup>c</sup>					15.79**					8.07*
Preschool/kindergarten	10	1559	.29**	.19-.38		7	3581	.29**	.15-.42	
Grades 1-3	14	3227	.41**	.33-.48		36	5738	.39**	.33-.45	
Grades 4-8	8	456	.57**	.47-.66		13	3686	.50**	.41-.58	
<i>Procedural characteristics</i>										
Use of covariates					0.54					1.23
Zero-order correlations	26	2376	.41**	.34-.47		42	6767	.42**	.36-.48	
Partial corr./regression	8	2996	.36**	.25-.47		17	9241	.36**	.26-.45	
Type of proficiency					1.56					0.56
Vocabulary	14	1427	.42**	.33-.50		20	4818	.38**	.28-.48	
Grammar/syntax/morph.	4	193	.48**	.30-.63		4	193	.47**	.23-.66	
General proficiency	16	3752	.37**	.28-.44		35	10997	.41**	.33-.48	
Language modality					3.78					0.42
Receptive	14	1465	.33**	.24-.42		20	5895	.38**	.28-.48	
Expressive	7	2851	.44**	.33-.54		6	2858	.44**	.27-.58	
Both	13	1056	.44**	.35-.53		33	7255	.41**	.33-.48	
Type of reading					6.28*					4.40
(pseudo)word reading	17	1285	.32**	.23-.40		18	4051	.31**	.21-.42	
Reading comprehension	11	3385	.46**	.37-.54		19	5669	.42**	.33-.51	
General reading score	6	702	.46**	.33-.57		22	6288	.55**	.37-.53	

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup>  $Q$ -statistic for total set stands for homogeneity ( $df = k - 1$ ),  $Q$ -statistic for moderator for effect of contrasts ( $df = \text{number of subgroups} - 1$ )

<sup>b</sup> For moderators that have a category 'unclassifiable', the  $Q$ -statistic reported in this table does not include the unclassifiable category

<sup>c</sup> Studies in which language proficiency was measured in grades 9-12 or for which age/grade information was missing excluded

Table 5. Meta-analytic results of studies of cross-language relations between oral proficiency and reading

	L1-L2 relations					L2-L1 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a, b</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a, b</sup>
<b>Total set</b>	33	5221	.12**	.05-.19	184.84**	23	3205	.07	-.01-.15	89.82**
<i>Sample characteristics</i>										
SES					1.28					2.30
Low	19	2990	.11*	.02-.20		15	1821	.05	-.05-.14	
Other	9	1501	.20**	.06-.33		5	1142	.20*	.03-.36	
Unclassifiable	5	730	.01	-.18-.19						
Spanish-English U.S.					0.57					1.07
No	11	1714	.16*	.03-.28		9	571	.13	-.01-.26	
Yes	22	4144	.10*	.01-.19		14	2634	.04	-.06-.14	
L1 education					5.85					4.91
Separate classes	10	633	.22**	.12-.32		7	459	.14*	.01-.28	
Bilingual/transitional	8	1904	.21**	.11-.31		6	1760	.15*	.02-.27	
L2 immersion	10	950	.07	-.03-.17		5	382	-.03	-.18-.13	
Unclassifiable	5	1734	-.08	-.20-.03		5	604	-.03	-.17-.12	
Immigrant generation					3.56					0.00
First	5	375	.27**	.11-.42		4	318	.12	-.18-.39	
Second or later	9	2086	.05	-.07-.16		6	378	.12	-.13-.36	
Unclassifiable	19	2760	.11**	.03-.20		13	2509	.05	-.05-.15	
Age/grade level <sup>c</sup>					1.30					0.30
Preschool/kindergarten	5	1117	.15*	.00-.29		5	557	.05	-.11-.22	
Grades 1-3	17	2186	.13**	.04-.22		13	2320	.09	-.01-.19	
Grades 4-8	7	928	.04	-.10-.18		4	268	.03	-.17-.23	
<i>Procedural characteristics</i>										
Use of covariates <sup>d</sup>					0.00					
Zero-order correlations	26	3003	.12**	.03-.20						
Partial corr./regression	7	2218	.12	-.04-.27						
Type of proficiency					4.30					1.53
Vocabulary	8	2186	.18**	.06-.31		7	873	.04	-.10-.19	
Grammar/syntax/morph.	4	193	.26*	.05-.44		4	193	.20	-.02-.40	
General proficiency	21	3932	.07	-.01-.15		12	2139	.06	-.06-.17	
Language modality <sup>e</sup>					1.68					1.28
Receptive	6	458	.06	-.11-.23		9	867	-.01	-.15-.13	
Expressive	4	1568	.22*	.04-.38						
Both	23	3195	.11*	.02-.19		11	899	.10	-.03-.23	
Type of reading <sup>f</sup>					3.72					0.84
(pseudo)word reading	12	754	.16*	.04-.28		14	1068	.09	-.03-.20	
Reading comprehension	7	1735	.20**	.06-.33						
General reading score	14	2732	.05	-.06-.15		7	953	.00	-.14-.15	

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup>  $Q$ -statistic for total set stands for homogeneity ( $df = k - 1$ ),  $Q$ -statistic for moderator for effect of contrasts ( $df =$  number of subgroups - 1)

<sup>b</sup> For moderators that have a category 'unclassifiable', the  $Q$ -statistic reported in this table does not include the unclassifiable category

<sup>c</sup> Studies from grades 9-12 or for which age/grade information was missing excluded

<sup>d</sup> Use of covariates could not be tested as a moderator for L2-L1 relations, because group sizes were too small

<sup>e</sup> Studies with expressive language proficiency measure excluded in analysis of L2-L1 relations

<sup>f</sup> Studies with reading comprehension as reading measure excluded in analysis of L2-L1 relations

Table 6. *Meta-analytic results of studies of within-language relations between oral proficiency and spelling, math, and academic achievement*

	L1 relations					L2 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a</sup>
Spelling	4	247	.43**	.32-.53	2.03**	9	1405	.42**	.38-.46	16.67**
Math						8	6351	.24**	.13-.34	104.33**
Academic achievement						7	4018	.22**	.08-.36	115.97**

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup> *Q*-statistic stands for homogeneity ( $df = k - 1$ )

### Language proficiency in relation to other school outcomes

Within-language relations for the three other school outcomes – spelling, math, and academic achievement – are presented in Table 6, and cross-language relations in Table 7. For all three outcomes there were significant moderate to strong within-language effects ( $.22 < r < .43$ ), confirming Hypothesis 1, but no significant cross-language effects ( $-.08 < r < .21$ ). Hypothesis 2 does thus not hold true for these school outcomes. With one exception, moderators could not be tested for these school outcomes, because group sizes were too small. The exception was the comparison between Spanish-English samples from the U.S. and other samples, which could be tested for L1-L2 relations of academic achievement. This variable was not a significant moderator of this relation ( $Q = 3.27, p = .07$ ).

Table 7. *Meta-analytic results of studies of cross-language relations between oral proficiency and spelling, math, and academic achievement*

	L1-L2 relations					L2-L1 relations				
	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a</sup>	<i>k</i>	<i>n</i>	<i>r</i>	95% CI	<i>Q</i> <sup>a</sup>
Spelling	5	284	.21	-.01-.41	13.28*	4	247	.08	-.27-.41	22.93**
Math	6	1443	.07	-.07-.21	22.59**					
Academic achievement	9	2372	-.08	-.18-.02	39.05**					

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup> *Q*-statistic stands for homogeneity ( $df = k - 1$ )

Table 8. *Meta-analytic results of differences between correlations of language proficiency with school outcomes*

	Within-language					Cross-language					Within vs. cross				
	<i>k</i>	<i>n</i>	<i>d</i>	95% CI	<i>Q</i> <sup>a</sup>	<i>k</i>	<i>n</i>	<i>d</i>	95% CI	<i>Q</i> <sup>a</sup>	<i>k</i>	<i>n</i>	<i>d</i>	95% CI	<i>Q</i> <sup>a</sup>
Early literacy	21	2142	-.06*	-.11-.00	29.90	18	1617	.01	-.05-.07	22.73	28	2726	.14**	.07-.21	76.87**
Reading	24	3361	-.00	-.08-.07	83.30**	19	2736	.06	-.01-.12	38.01**	35	4889	.20**	.15-.26	91.16**
Spelling	4	247	.01	-.12-.14	2.88	4	247	.11	-.02-.23	0.81	5	284	.24*	.00-.48	15.53**
Math											6	1697	.35**	.13-.56	75.82

Note: \*  $p < .05$ , \*\*  $p < .01$

<sup>a</sup>  $Q$ -statistic for stands for homogeneity ( $df = k - 1$ )



### **Comparison of cross- and within-language relations in L1 and L2**

The results presented above suggest that effects measured in L1 did not differ substantially from the same effect measured in L2, whereas within-language relations between oral language proficiency and school outcomes were stronger than cross-language relations. The results of meta-analyses of the standardized differences between correlations are presented in Table 8. Regarding within-language relations, only one significant difference between L1 and L2 was found, with a stronger within-language relation between language proficiency and early literacy in L2 than in L1 ( $d = -.06, p < .05$ ), so Hypothesis 4 is confirmed for all school outcomes except early literacy. There were no significant differences between within-language relations in L1 versus L2 for reading or spelling. Also, no significant differences between cross-language relations in L1 versus L2 were found, which corroborates Hypothesis 5. For the comparison between within- and cross-language effects all differences that we could test were significant, confirming Hypothesis 6. All effects pointed in the same direction, namely that within-language relations were stronger than cross-language relations between oral language proficiency and school outcomes. The significant moderators for these effects were consistent with the differences in effects between subgroups reported in Tables 2-5.

2

## **DISCUSSION**

The results of the current meta-analyses show that within-language relations between the oral language proficiency of bilingual children with an immigrant background and their school outcomes were substantial and significant. In addition, these relations were significantly stronger than cross-language relations between oral proficiency and school outcomes. Within-language relations between oral proficiency and the school outcomes of early literacy, reading, spelling, mathematics, and academic achievement were moderate to strong. For cross-language relations, only weak positive relations were found for L1 oral proficiency with L2 early literacy and L2 reading, and for L2 oral proficiency with L1 early literacy.

### **Within-language relations**

The positive within-language relations that we found were in line with our expectations. Oral language proficiency, particularly in the language of education, is important to communicate with the teacher and to understand explanations and instructions in class, and is thus likely to support positive school outcomes (Hoff, 2013). The school outcomes in the areas of early literacy, reading and spelling are strongly language-related. For these outcomes, language proficiency does not only play a role in the understanding of instructions, but is also an integral part of the task itself. It is thus not surprising that the relations of oral language proficiency with these outcomes were stronger compared to relations with mathematics and general academic achievement. The number of studies reporting on L1 within-language relations between oral language proficiency and school outcomes was smaller than the number of studies reporting on L2 within-language relations, which is not surprising given that education in L1 is not always provided. For those studies that reported within-language relations in both languages, the strength of within-language relations did not differ significantly for L1 and L2 in the case of reading and spelling outcomes, whereas for early literacy within-L2 relations were stronger than within-L1 relations.

### **Cross-language relations**

The positive cross-language associations between L1 oral proficiency and L2 early literacy and reading found in our meta-analyses are in line with the *interdependence hypothesis* (Cummins, 1979), which states that competence in L2 is partly based on competence in L1. This would converge with findings from neuroimaging studies that the same brain regions are active in L1 and L2 processing (Abutalebi, 2008; Buchweitz & Prat, 2013). However, cross-language relations were less strong than within-language relations. From the cross-language relations that we found, it cannot be inferred whether the *threshold hypothesis* (Cummins, 1979), which states that L1 proficiency has to be of a sufficient level for positive cross-language transfer to take place, holds true. It is possible that the positive cross-language relations we found would have been stronger when only respondents with a certain basic L1 proficiency level had been taken into account or weaker for samples with a more limited L1 proficiency. To test this hypothesis we would need studies that include (sub)samples with L1 proficiency above or below a certain threshold. However, only four of the

studies in our meta-analyses used a basic L1 proficiency level, dominance in L1 over L2 or L2 over L1, or an equal proficiency in L1 and L2 as a selection criterion (Anthony et al., 2009; Arab-Moghaddam & Sénéchal, 2001; Gholamain & Geva, 1999; Gorman, 2012), and none reported relations between oral language proficiency and school outcomes for different levels of L1 proficiency. In addition, there was also a positive correlation between L2 oral proficiency and L1 early literacy, which means that for this school outcome transfer from one language to the other is bidirectional. This might be explained by the fact that early literacy instruction is likely to take place in L2, and that development of this skill in L2 might trigger the acquisition of corresponding skills in L1 (Meisel, 2004).

As we did not find any significant negative cross-language relations, the *subtractive bilingualism* hypothesis was not supported (Butler & Hakuta, 2004). Instead we propose a *task-dependent bidirectional transfer hypothesis* stating that in addition to within-language effects of oral language proficiency on school outcomes, cross-language transfer from L1 to L2, and reversed, can take place and that the strength of this transfer depends on the type of oral language proficiency task and the type of school outcome. This hypothesis should be tested further in future research. With regard to the improvement of school outcomes of bilingual children with an immigrant background, this hypothesis suggests that it is important to consider whether stimulation in L1 will be beneficial for a particular school outcome and for which type of stimulation chances of transfer are highest.

### **Moderator effects**

Only six out of 96 tested moderator effects were found to be significant. The only significant procedural moderator was the language proficiency measure, showing that the within- and cross-language associations of L1 oral proficiency with early literacy in L1 and L2 were generally stronger for studies that used vocabulary as language proficiency measure compared to studies that used a general proficiency measure. A possible explanation for this moderator effect is that vocabulary and early literacy are more strongly related because they are both measured at the word level, whereas a general proficiency measure also includes measures at the sentence or paragraph levels. Neuroimaging studies have shown that word-level conceptual representations converge across languages, whereas at the sentence or paragraph level grammatical rules and representations need to be appropriately selected for the comprehension and production of a certain target

language (Buchweitz & Prat, 2013). Thus, because general oral language proficiency measures also include grammatical aspects whereas early literacy tasks only require word-level skills, general proficiency measures may have less strong within- and cross-language relations with early literacy.

Four significant sample moderator effects were found, including child grade level, type of reading proficiency measure, and participation in L1 language classes or bilingual programs. Within-language relations between oral proficiency and reading were moderated by the grade level or age of the children. Also, the type of reading proficiency measure moderated the relation between L2 proficiency and L2 reading. The relation was stronger when reading comprehension was used as reading proficiency measure compared to (pseudo)word reading. The influence of both of these moderators is in line with the Simple View of Reading (Hoover & Gough, 1990), which suggests that the importance of language proficiency for reading increases in later grades, when the focus in reading instruction moves from word recognition to comprehension. In other words, oral language proficiency is more important for reading comprehension than for word reading, and this type of reading proficiency is more prominent in later grades.

The relation between L2 proficiency and L2 reading was stronger for samples in which the majority of the respondents took part in L1 language classes outside the regular school program or were enrolled in a bilingual or transitional program, compared to samples in which the majority of respondents were in an L2 immersion program. This moderator effect, in which the relation in L2 is less strong when children are educated in L2 only, may seem counterintuitive. A review of effective reading programs for English Language Learners (ELLs) supports the importance of programs emphasizing language development in both languages (Cheung & Slavin, 2005). Reading programs intended for use with English-proficient students are typically adapted and emphasize vocabulary and oral language more when used with ELLs (Cheung & Slavin, 2005). It may thus be that extra attention for language education in general makes children with bilingual educational input profit more. This idea is supported by the trend towards stronger cross-language relations between oral proficiency and reading for subgroups with some form of L1 education, that can be inferred from the correlations coefficients presented in Table 5, that are higher for the sub-categories with some form of L1 education than for the L2 immersion category.

None of the other sample or procedural characteristics (sample size, SES, immigrant generation, whether or not it is a Spanish-English sample in the U.S., gender, publication year, and use of covariates) showed significant moderator effects. For some of these variables this was contrary to our expectations. Based on the literature on achievement gaps (Barrett et al., 2012; Marx & Stanat, 2012) and the immigrant paradox (Fuligni, 1998; Suárez-Orozco, Rhodes, et al., 2009), we expected the relations to be stronger for samples with a higher SES and from an earlier immigrant generation. Our meta-analytic results however, did not confirm these expectations and instead show that the relation between oral language proficiency and school outcomes is very robust and generally not influenced by sample and procedural characteristics.

### **Publication bias**

Despite the fact that publication bias seems common in psychological sciences (Ferguson & Heene, 2012), we did not find indications for such bias, according to funnel plot inspection and the trim and fill procedure (Duval & Tweedie, 2000). Most studies included in our meta-analyses of relations between oral language proficiency and school outcomes reported correlations for more than one language or more than one school outcome. In such studies it is more likely that null findings that otherwise may not have been published and thus would have led to publication bias are now reported in addition to positive relations found for the other language or school outcome. For those studies that compared a bilingual and a monolingual sample (e.g., Burgoyne, Whiteley, & Hutchinson, 2011; Silvén & Rubinov, 2010), such null findings in the bilingual sample are more likely to be reported to show contrasts between bilinguals and monolinguals. Moreover, none of the studies included in our meta-analyses of the differences between within- and cross-language effects reported this difference as a study result, which makes it unlikely to find any publication bias for those findings.

### **Limitations and recommendations**

Some limitations of the input for the meta-analyses and related recommendations for future research can be noted. First, the numbers of studies that included spelling, math or academic achievement as an outcome were relatively low. Therefore, some of the within- and cross-language comparisons and most of the moderator effects could not be tested for these outcomes. The significant relations

that we found in the meta-analyses of the few studies available point to a positive relation between oral language proficiency and these school outcomes. Future research should study these relations further in different immigrant-background samples, so that future meta-analyses on this topic can include more studies and thus draw more firm conclusions and also test moderator effects. Second, many studies did not report details on potentially important moderators, such as for SES, the presence or absence of L1 education, and immigrant generation. Thus for these variables, there were fewer studies to include in the moderator analyses, which have hampered the identification of moderator effects. Future studies in this field could include specific information on these sample characteristics. Third, there were only very few studies that examined a combination of an L1 and L2 with the same script, other than Spanish and English. Therefore, L1 (coded as Spanish/ other language with same script as L2/ other language with different script as L2/ combination of various L1s) could not be taken into account as a separate moderator variable. Future studies could focus on bilingual samples with same-script languages other than English and Spanish, so that future meta-analyses could test the effects of resemblance in scripts on the relation between oral language proficiency and school outcomes.

Despite the rigorous methodology of meta-analysis, there are also some potential weaknesses (Shelby & Vaske, 2008). The so-called *apples and oranges* problem and the issue of mixing studies that differ in methodological quality were dealt with by coding moderators such as sample size, use of covariates and measurement of language proficiency and testing their influence on the meta-analytic results. The random effects model was used to take heterogeneity of study outcomes into account. The risk of error and bias due to inclusion or exclusion of studies on error and bias was reduced by using several search engines and including all studies that reported a statistic reflecting the relation between language proficiency and school outcomes. As described earlier the *file-drawer* problem does not effect our results, as there were no indications of publication bias. Lastly, we never used multiple findings from the same study within a single analysis, to ensure that the effect sizes were independent of one another.

## Implications

The findings of our meta-analyses are relevant to education policies and practices aimed at bilingual children's academic development. We found that stimulation of both L1 and L2 can be supportive for immigrant-background children's educational achievement, which could contribute to narrowing the achievement gap with native-born children, and that L1 skills do not develop at the expense of L2 skills. Among bilingual children with an immigrant background, children who are more proficient in oral language generally have better school outcomes. These children may also be those who profit most from the cognitive advantages of bilingualism (Adesope et al., 2010) and therefore fare better in school. This means that we should not only try to close the achievement gap between immigrant-background and native-born children, but at the same time try to prevent a potential achievement gap within immigrant-background groups, caused by language proficiency differences. The few moderator effects that were found suggest that the attention for oral language proficiency should be continued throughout children's school career, because the importance of oral proficiency is higher at higher grade levels with more focus on reading comprehension. Previous studies have shown positive effects of bilingual education programs on L2 proficiency (Barnett et al., 2007; Slavin et al., 2011). Our analyses add to that knowledge by showing that additional education in L1 can also foster the relation between L2 proficiency and school outcomes. In areas with large communities of a certain language minority in North-America as well as in Europe, there is indeed a call for incorporating L1 in education (Mackey, 2004; Tabouret-Keller, 2004). For the ongoing debate on language education policies our findings suggest that L1 might be included in education in order to obtain the best possible school outcomes in L2.

## Conclusion

In conclusion, our findings show moderate to strong within-language relations between the oral language proficiency of bilingual children with an immigrant background and their school outcomes, and also some weaker but significant cross-language relations. No negative cross-language relations were found. Thus, the meta-analyses do not provide support for the hypothesis of *subtractive bilingualism*. Based on our findings, we propose a *task-dependent bidirectional transfer hypothesis*. In addition to within-language effects of oral language

proficiency on school outcomes, cross-language transfer can take place and the strength of this transfer effect depends on the type of oral language proficiency task and the type of school outcome. Our findings were robust and were found regardless of sample and procedural variations. Stimulating oral language proficiency in both languages can be a key factor in improving the school outcomes of bilingual children with an immigrant background.





# Chapter

# 3

**Bilingual toddlers reap the language they sow:  
Ethnic minority toddlers' childcare attendance  
increases maternal host language use**

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## ABSTRACT

This study investigated the development and correlates of language use in bilingual Turkish-Dutch immigrant mothers and their toddlers. In this short-term longitudinal study 87 mothers completed questionnaires on their Dutch and Turkish language use, ethnic identity, and use of childcare. Observational data were obtained for maternal supportive presence and observed language use with the child. We found evidence that mothers who felt more strongly connected to the Turkish culture spoke more Turkish and less Dutch with their toddlers. The amount of Dutch that was used in mother-toddler communication increased significantly between the ages of two and three years. Mothers of children who started visiting childcare or who lived in a neighborhood with a low percentage of non-Western immigrants showed a larger increase in use of the Dutch language with their toddlers. Our findings emphasize the importance of contextual factors in determining language use in ethnic minority families.

**Keywords:** bilingual; toddlers; childcare; maternal language use; neighborhood

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## INTRODUCTION

Children in immigrant families often grow up with two languages: the language of the country of origin, their 'ethnic language', and the language of the country they are living in, their 'host language'. The extent to which children are exposed to these two languages can vary substantially, as well as with whom and in which situations communication in both languages takes place (Hoff, 2006). Second-generation immigrant parents can be expected to be the most balanced bilinguals as compared to other immigrant generations, because they are likely to have had an early exposure to both the ethnic and the host language (Hakuta & D'Andrea, 1992), and can thus potentially provide exposure to both languages to their own children. The extent to which mothers use the two languages with their children may be influenced by maternal characteristics such as mothers' sensitive responsiveness (Hoff, 2006), education level (Van Tubergen & Kalmijn, 2009), and ethnic identity (Extra & Yağmur, 2010).

Children themselves can also invite more input of a certain language by using this language (Pearson, 2007). This in turn can be dependent on the introduction into childcare services, such as playgroups and daycare centers (Leseman, 2000). In addition, the ethnic constellation of the neighborhood is an environmental factor that can influence language use (Van Tubergen & Kalmijn, 2009). In a sample of second-generation Turkish mothers and their toddlers in the Netherlands, the present study examines (1) the development of ethnic and host language use in mother-toddler interaction between the ages of two and three years; (2) the role of maternal, child, and environmental factors that may explain changes or stability in maternal language use. Insight in the language use in the home situation can facilitate appropriate support of bilingual children's language development.

Mothers provide opportunities for communication to their children: these opportunities are dependent on mothers' responsiveness to children's vocalizations and speech, which in turn influences the children's language development (Hoff, 2006). Children of mothers who are more responsive to their speech and play activities achieve basic language milestones earlier than children of less responsive mothers (Tamis-LeMonda, Bornstein, & Baumwell, 2001). This relation between responsiveness and language development is likely to be affected by more engagement in communicative situations of responsive mothers

as well as more language input by means of verbal responsiveness to the children's signals (Hoff, 2006). Because of this increased verbal responsiveness bilingual mothers who show high sensitivity to their children's signals might adapt the language that they use with their children to the language that their children speak to them. In a sample of Turkish immigrant mothers and their toddlers higher maternal sensitivity was found to be related to more use of the Turkish language (Yaman, Mesman, Van IJzendoorn, Bakermans-Kranenburg, & Linting, 2010c). It should be noted that this latter paper focused on toddlers with externalizing problems (oppositional, aggressive or overactive behavior), but these were unrelated to mothers' language use. To our knowledge there are no studies on the influence of maternal sensitive responsiveness on the language development of bilingual children in a general population sample.

Previous research among Turkish and Moroccan immigrants in the Netherlands showed that a higher educational level of both partners in a relationship increased their mutual use of the Dutch language (Van Tubergen & Kalmijn, 2009). Other studies have shown that a higher socio-economic status (SES) is related to a lower proficiency in the ethnic language (Phinney, Romero, Nava, & Huang, 2001; Oller & Eilers, 2002). Immigrants with a higher SES are likely to be more successful in learning the host language and learning this language will in turn provide them with more economic gains (Van Tubergen & Kalmijn, 2009). As a result the necessity to retain a high level of the ethnic language is lower for immigrants with a higher SES, at least in terms of economic gains. Furthermore, SES has been found to indirectly influence children's language growth through maternal speech (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). Differences in ethnic and host language use and proficiency between mothers with different SES backgrounds could result in differences in the language(s) they speak with their children and the skills they have to adapt to the language use pattern of the children.

Ethnic identity has been found to correlate positively with ethnic language proficiency in adolescents from several ethnic backgrounds (Phinney et al., 2001). A stronger ethnic identity is related to more use of the ethnic language and less use of the host language within the Turkish group in the Netherlands as well as in other ethnic groups (Extra & Yağmur, 2010; Oh & Fuligni, 2010). The ethnic language seems to be an important manifestation of an individual's ethnic identity

(Extra & Yağmur, 2010), and might therefore play an important part in Turkish-Dutch mothers' choice of the language to use with their child.

Looking at the other side of the dyad, children invite more input of a certain language by using this language themselves (Pearson, 2007). This suggests that the language environment of the child outside the family can indirectly influence mother's language use with her child. Indeed, it was found that Dutch language use of Turkish children in the Netherlands increased between ages three and four due to the introduction into childcare and kindergarten. Additionally, the children's Dutch vocabulary was related to Dutch language use in the home environment (Leseman, 2000). This can be explained by the fact that children are exposed to a (predominantly) Dutch environment in childcare or kindergarten; as a result these children will start using the Dutch language more at home as well. Parents' increased use of the Dutch language in the home environment can in turn stimulate the children's Dutch vocabulary in addition to the language stimulation in childcare or kindergarten. Mothers of bilingual English-Spanish children in kindergarten or Head Start preschool programs were found to increasingly communicate in English with their children between the ages of four and six years (Hammer, Davison, Lawrence, & Miccio, 2009). This increase is likely to be influenced by the education system, which may implicitly or explicitly communicate that the host language is important for children's academic success (Hammer et al., 2009). Nevertheless, active language use patterns of parents and children may differ. In the home situation, Turkish children in the Netherlands have been found to exclusively speak Dutch more often than their parents (De Houwer, 2007). The parents tended to use a combination of both the Dutch and the Turkish language.

The ethnic composition of a neighborhood influences the contact of its immigrant inhabitants with either people of their own ethnicity or Dutch people (Dagevos, 2009). Turkish and Moroccan immigrant men in the Netherlands living in areas with a higher percentage of non-Western immigrants have been found to use the Dutch language less frequently with their partner compared to immigrants in neighborhoods with a lower percentage of non-Western immigrants (Van Tubergen & Kalmijn, 2009). Immigrants in neighborhoods with a higher concentration of non-Western immigrants will experience less pressure to use the host language than immigrants in a neighborhood with a lower ethnic

concentration (Van Tubergen & Kalmijn, 2009). These neighborhood characteristics can influence the language use pattern between mother and child.

In the current study we will focus on the language use of Turkish second-generation mothers with their toddlers. The toddler phase is important in language development, as children's abilities to comprehend and produce language emerge between 12 and 24 months, and continue to grow substantially in subsequent years (Zubrick, Taylor, Rice, & Slegers, 2007). By the age of two all children can be expected to be able to comprehend and produce language to some degree. In the specific case of bilingual children, the optimal age for dual language development starts in the second year of life (Meisel, 2004). All children in the current study can be considered to develop two languages simultaneously, because they start acquisition of the two languages within the first three years of life. Also, bilingual toddlers' ability to choose the language they use depending on the person they are speaking to is present from age two onwards (Meisel, 2004). Furthermore, between ages two and three toddlers in the Netherlands are often introduced into either a playgroup or a child daycare center. Playgroups in the Netherlands can be used to let toddlers get experience with peer contact as a preparation for primary school. Children usually visit a playgroup during several mornings or afternoons per week and the groups consist of toddlers only. Child daycare centers, on the other hand, offer parents a place for their children to stay while the parents are at work. Children usually visit a daycare center full days and the groups in these centers can include a broader age range. Both playgroups and daycare centers may have special programs for early childhood education to address possible language and/or educational disadvantages early. During the data collection period of this study approximately 53% of the at-risk children were reached by these preschool education programs (Jepma, Kooiman & Van der Vegt, 2007). The introduction into these types of childcare can have a positive influence on their use of the host language (Leseman, 2000).

The Turkish population is the largest immigrant population in the Netherlands and more than 15% of this group consists of children younger than five years (Central Bureau of Statistics, 2008b). Furthermore, Turkish immigrants report more difficulties with the Dutch language than other non-Western immigrants (SCP, 2009; Van Tubergen & Kalmijn, 2009) and were found to keep to their ethnic language more often, compared to other immigrant groups in the Netherlands (Extra & Yağmur, 2010). Turkish preschoolers have been found to be

far behind in Dutch as well as Turkish vocabulary compared to a monolingual Dutch comparison group (Leseman, 2000). We specifically focus on second-generation Turkish families because second-generation parents are expected to be the strongest bilinguals, which means that they are expected to be equally proficient in both the ethnic and the host language (Hakuta & D'Andrea, 1992). Furthermore, the growth of the number of Turkish inhabitants in the Netherlands is mostly due to the increase of the second-generation population and much less due to migration (Distelbrink & Hooghiemstra, 2005). Insight in the language use at home in this large immigrant population can yield important information to provide appropriate and tailored support of these children's language development.

In this study, we aim to answer the following questions:

- (1) Is the amount of Dutch or Turkish that mothers use in communication with their toddlers related to maternal education, mothers' sensitivity, mothers' ethnic identity, the start of childcare, or the ethnic constellation of the neighborhood?
- (2) Does the amount of Dutch or Turkish that mothers use in communication with their toddlers change between the ages of two and three years?
- (3) Is change or stability in Dutch and/or Turkish maternal language use over time related to maternal education, mothers' sensitivity, mothers' ethnic identity, the start of childcare, or the ethnic constellation of the neighborhood?

In line with previous research, we hypothesize positive relations of Dutch language use with maternal education and start of childcare, and negative relations with mothers' sensitivity, mothers' ethnic identity and the percentage of non-Western immigrants in the neighborhood. Furthermore, we hypothesize that the use of the Dutch language will increase between the age of two and three years, as was the case for the English language in the study of Hammer et al. (2009).

## METHOD

### Participants and procedure

Data for the current study were collected in a research project focusing on Turkish immigrant mothers and their toddlers in the Netherlands (Yaman, Mesman, Van IJzendoorn, & Bakermans-Kranenburg, 2010a). The sample consisted of 87 second-generation Turkish immigrant mothers of two-year-old children who completed questionnaires and extensive home observations at two time points. These mothers were recruited from the municipal registers of several cities and towns in the western and middle region of the Netherlands. Only second-generation Turkish immigrant mothers born in the Netherlands (with at least one of their parents born in Turkey) with a two-year-old child (age 22-29 months) were selected to ensure the homogeneity of the sample and to control for confounding effects of ethnicity and migration.

In total, 384 families were reached of whom 230 (60%) agreed to participate. One-hundred and forty-four of these mothers (63%) filled out questionnaires on child behavior problems and also participated in a video-taped one-hour home visit (Time 1). One year after the first home visit, we contacted the mothers for a second home visit (Time 2). One-hundred and thirty-two mothers (92%) and their children participated in this second visit. One-hundred and five of these mothers (80%) also filled out a questionnaire at Time 2. To prevent biased or indistinctly interpretable results the decision was made to impute only missing data on item level and exclude participants for whom one or more complete scales were missing. For 87 of the families we had a complete dataset for the current analyses. This attrition was mostly due to mothers not completing all parts of the questionnaires. Despite the fact that the mothers included in our analyses filled out all relevant parts of the questionnaires, there were still a few missing values on item level within scales. They were substituted with the mean score of the particular respondent on the remaining items of the scale (Downey & King, 1998).

Mothers who dropped out before the second measurement or who did not provide a complete dataset ( $N = 57$ ) did not differ significantly from mothers who provided a complete dataset at both time points ( $N = 87$ ) in age ( $t(142) = -1.32$ ,  $p = .19$ ), child's gender ( $t(142) = 0.79$ ,  $p = .43$ ), reported use of the Dutch ( $t(130) = 0.33$ ,  $p = .30$ ) or Turkish language ( $t(130) = -1.67$ ,  $p = .35$ ), percentage of



non-Western immigrants in the neighborhood ( $t(142) = -1.06, p = .29$ ) or use of childcare ( $t(143) = -1.48, p = .14$ ).

The children had a mean age of 25.24 months ( $SD = 1.62$ ). Fifty-one percent of the sample consisted of boys. Most children were reared in two-parent families (90%), with mothers who had a mean education of  $M = 2.98$  ( $SD = 0.66$ ) on a five-point scale (1 = primary education, to 5 = higher vocational education or university). The mothers had a mean age of 27.18 years ( $SD = 2.91$ ) at the first home-visit. The majority of the children had no siblings (63%), 35% had one sibling, and 2% had two or more siblings.

### Measures

Questionnaires were available in the Dutch and the Turkish language. Mothers were free to choose the language of the questionnaires. All questionnaires in this study were translated from Dutch into Turkish and back-translated in order to ensure correct wording in the Turkish language. Most mothers (84%) completed the Dutch version of the questionnaire. This may be explained by the fact that all second-generation Turkish mothers have attended school in the Netherlands, and are thus more used to written communication in Dutch, even though they may prefer Turkish for spoken communication (Yaman, Mesman, Van IJzendoorn, & Bakermans-Kranenburg, 2010b)

### Language use

Language use was measured by asking Turkish mothers how often they spoke the Turkish and Dutch language with important others (their children, partner, parents, brothers and sisters, other family members, and friends) (Van Oort et al., 2006) on a five-point scale (0 = never; 1 = occasionally; 2 = sometimes; 3 = often; 4 = very often/ always). An overall score for each language was calculated from the six items, but in the analyses some of the items have also been used separately. The internal consistencies for the overall use of the Turkish and Dutch language were .76 and .78 respectively.

The language use of mothers with their children during the structured tasks of the video observation was also assessed. Language use in these interactions was rated as 1 = predominantly Turkish, 2 = mixed use of Dutch and Turkish, or 3 = predominantly Dutch. Videos were rated in either of the 'predominant' categories if mothers consistently spoke one language or if

sentences in the predominant language included only separate words or expressions in the non-predominant language. In all cases in which mothers alternated between the two languages, videos were rated as 'mixed'. All videos were coded by two researchers. Agreement between the coders was 90.8%. If the coders rated a video differently, this difference was always between 'mixed' and one of the 'predominant' categories. These cases were discussed to obtain a consensus rating that both researchers agreed upon.

### ***Ethnic identity***

Ethnic identity was measured at Time 1 with an adapted version of the Psychological Acculturation Scale (PAS) (G. W. J. M. Stevens, Pels, Vollebergh, & Crijnen, 2004). Emotional connectedness of the mothers to the Turkish culture (six items) and Dutch culture (six items) (e.g., I feel comfortable around Turkish/Dutch people) were rated on a five-point-scale (ranging from 0 = totally disagree, to 4 = totally agree). The internal consistencies for the emotional connectedness to the Turkish and Dutch culture were .73 and .81 respectively.

### ***Percentage of non-Western immigrants in the neighborhood***

The calculation of the percentage of non-Western immigrants in the neighborhood was based on the families' postal codes. The number of non-Western immigrants in the postal code area (Central Bureau of Statistics, 2008a) was divided by the total number of residents in the area and multiplied by 100 to get the percentage of non-Western immigrants. Since the migration of both native Dutch people as well as Turkish immigrants to other neighborhoods was relatively low in the period 2005-2008 as compared to the years before (Kullberg & Nicolaas, 2009), this percentage can be considered as stable over the years that this study took place.

### ***Use of childcare***

We measured use of childcare by asking mothers whether or not the child visited a playgroup and whether or not the child visited a daycare center. An additional variable was computed by subtracting the Time 1 answer to these questions from the Time 2 answers. If the value was positive this meant that the child started using a playgroup and/or daycare center between Time 1 and Time 2, if the value was zero or negative no childcare was used or the child stopped visiting it. The

use of childcare increased significantly between Time 1 and Time 2 (see Table 1). Thirty percent of the children started visiting childcare between Time 1 and Time 2. Of these children, 73% started visiting a playgroup and 27% started visiting a daycare center. One child stopped visiting childcare during this period.

### ***Maternal sensitivity***

Mothers' sensitive responsiveness to their toddlers was measured during three problem-solving tasks at Time 1 and two tasks at Time 2, consisting of a construction task (at Time 1 and 2), a jigsaw puzzle (at Time 1 and 2) and a sorting task (only at Time 1) for five minutes per task. These tasks were somewhat too difficult considering the age of the children and mothers were instructed to help their children in a way they would normally do. The observations were rated with the Erickson scales to measure mothers' supportive presence on a 7-point scale (Egeland, Erickson, Moon, Hiester, & Korfmacher, 1990; Erickson, Sroufe, & Egeland, 1985). Supportive presence refers to the mother's expression of emotional support and positive regard by encouraging, giving support and confidence, reassuring and acknowledging the child's accomplishments on the tasks. Scale scores were computed by averaging the scores for the separate tasks. The scales were coded by two trained coders. The intraclass correlation (single rater, absolute agreement) was .71 for supportive presence.

## **RESULTS**

### **Maternal language use**

Descriptive statistics for the language variables are presented in Table 1. Overall, the mothers reported speaking the Turkish language significantly more often than the Dutch language, at Time 1 ( $t(86) = 8.78, p < .01$ ), and Time 2 ( $t(86) = 7.40, p < .001$ ). Regarding communication with their toddlers, mothers also reported using the Turkish language significantly more often than the Dutch language, at Time 1 ( $t(86) = -3.54, p < .01$ ), but not at Time 2 ( $t(86) = 0.61, p = .55$ ). Sixty-seven percent of the mothers spoke predominantly Turkish during the observation at Time 1, whereas at Time 2 this was only 35%. For both reported and observed language use, a significant increase in the use of the Dutch language was found between Time 1 and Time 2 ( $t(86) = 4.64, p < .001$ ;  $t(86) = -6.48, p < .001$

respectively). Also, a significant increase in use of childcare between Time 1 and Time 2 was found ( $t(86) = -4.30, p < .001$ ).

In a repeated-measures ANOVA language use with the child was compared to language use with others. The results show that mothers spoke significantly more Dutch with their toddlers ( $M = 2.40, SD = 1.02$ ) than with their parents ( $M = 1.01, SD = 1.17$ ), their partners ( $M = 1.83, SD = 1.15$ ), and other family members ( $M = 1.70, SD = 1.17$ ) (all  $p$ -values  $\leq .001$ ), but mothers spoke significantly more Dutch with their brothers and sisters ( $M = 2.86, SD = 1.01$ ) than with their toddlers ( $p < .001$ ).

$T$ -tests showed no significant differences between children whose fathers were also born in Turkey (70.1%) as compared to children whose fathers were born in the Netherlands in use of the Dutch ( $t(74) = 0.92, p = .36$  at Time 1;  $t(74) = 0.55, p = .59$  at Time 2) or Turkish language ( $t(74) = -1.54, p = .13$  at Time 1;  $t(74) = 0.14, p = .89$  at Time 2).

Differences in reported language use between the three groups of observed language use (Predominantly Turkish; Mixed; or Predominantly Dutch) were tested by means of oneway-ANOVAs. Mothers who spoke predominantly Dutch during the observations also reported speaking more Dutch than the other

Table 1. *Descriptives and t-tests of language variables and characteristics of mother, child and neighborhood*

	Time 1		Time 2		$t$ -value	$p$ -value
	Mean	( $SD$ )	Mean	( $SD$ )		
Reported Dutch overall	2.03	(0.74)	2.23	(0.70)	-3.52	<.01
Reported Turkish overall	3.07	(0.60)	3.02	(0.59)	.86	.39
Reported Dutch with child	2.40	(1.02)	2.88	(0.89)	4.64	<.001
Reported Turkish with child	2.98	(0.81)	2.77	(0.81)	2.06	<.05
Observed language use with child					-6.48	<.001
Predominantly Turkish	67%		35%			
Mix Turkish-Dutch	16%		29%			
Predominantly Dutch	17%		37%			
Maternal education	2.97	(0.66)				
Observed sensitivity	3.74	(1.39)	3.99	(1.30)	-1.59	.12
Connection to Dutch culture	2.22	(0.64)	2.19	(0.71)	0.53	.60
Connection to Turkish culture	3.03	(0.64)	3.14	(0.58)	-1.66	.10
Childcare use	30%		53%		-4.30	<.001
% Non-Western immigrants	46.09	(21.52)				

mothers ( $F(2) = 7.59, p < .001$  at Time 1;  $F(2) = 20.20, p < .001$  at Time 2). Mothers who spoke predominantly Turkish during the observations did report speaking more Turkish than the other mothers, but this difference was not significant ( $F(2) = 2.84, p = .02$  at Time 1;  $F(2) = 2.25, p = .11$  at Time 2). Because the direction of change over time is the same for observed and reported language use and the reported language use scale has the advantages of addressing each language separately and including a broader range of scale points, reported use of the Dutch and the Turkish language in mother-toddler communication will be used as language measure in further analyses.

Table 2 shows correlations among the language variables. The more frequently mothers used the Turkish language in communication with their toddlers, the less frequently they used the Dutch language with their toddlers, but only at Time 1 ( $r = -.46, p < .001$ ). Reported language use was significantly stable from Time 1 to Time 2 ( $r = .50, p < .001$  for Dutch;  $r = .36, p < .001$  for Turkish).

### **Correlations between language use and characteristics of mother, child and neighborhood**

Turkish mothers' reported language use with their children was not significantly related to maternal education, percentage of non-Western immigrants in the neighborhood, connection to the Dutch culture or observed sensitivity (see Table 2). Mothers who felt more emotionally connected to the Turkish culture reported using the Turkish language more frequently at Time 1 ( $r = -.32, p < .001$ ), and showed a less frequent reported use of the Dutch language at Time 2 ( $r = .38, p < .001$ ) (see Table 2). The differences in correlations between connection to the Turkish culture and use of either the Dutch or the Turkish language at Times 1 and 2 were not significant ( $p > .89$ ).

Mothers of children who visited childcare differed significantly in use of the Dutch language from mothers of children who did not visit childcare at Time 2, but not at Time 1 (see Table 3). Mothers of children who did visit these facilities reported using more Dutch with their child at Time 2 ( $t(86) = -2.24, p < .05$ ). There was no significant difference in use of the Turkish language between mothers of children who did or did not visit childcare.

Table 2. *Correlations between Turkish mother's language use and characteristics of mother, child and neighborhood*

	1.	2.	3.	4.
1. Reported Dutch with child (Time 1)	-			
2. Reported Dutch with child (Time 2)	.50*	-		
3. Reported Turkish with child (Time 1)	-.46*	-.38*	-	
4. Reported Turkish with child (Time 2)	-.16	-.21	-.36*	-
5. Maternal education	-.07	-.11	.04	.10
6. % non-Western immigrants	.00	-.06	.15	.10
7. Connection to Dutch culture	.21	.05	-.07	-.05
8. Connection to Turkish culture	-.07	-.32*	.38*	.20
9. Observed sensitivity (Time 1)	-.02	.03	.10	-.06
10. Observed sensitivity (Time 2)	.13	.12	-.10	-.13

Note. \*  $p < .001$

### **Relation between changes in language use and characteristics of mother, child and neighborhood**

To find out which variables were related to changes in use of the Dutch language with the child, we used repeated-measures ANOVAs with Time 1 and Time 2 use of the Dutch language with the child as the within-subject dependent variable, and maternal education, percentage of non-Western immigrants in the neighborhood, ethnic identity, maternal sensitivity and the start of childcare respectively as independent variables. The results show that the change of reported language use with the child over time was significantly affected by the start of childcare between Time 1 and Time 2,  $F(1, 85) = 4.00$ ,  $p < .05$ , and the percentage of non-Western immigrants in the neighborhood,  $F(1, 85) = 4.69$ ,  $p < .05$ . The increase in reported use of Dutch with the child was larger for mothers whose children started visiting childcare between Time 1 and Time 2 (Figure 1) and for mothers living in a neighborhood with a low percentage of non-Western immigrants (Figure 2). The same effect was found for the start of playgroup, which includes the majority of the children that started childcare,  $F(1, 85) = 4.13$ ,  $p < .05$ . It should be noted that the group of children who did not start childcare between Time 1 and 2 includes both children who were already in childcare at Time 1 and children who have never been in childcare. Therefore, we also conducted separate analyses for each of these latter two groups. ANOVAs showed that the increase in use of Dutch was significantly larger for children who started childcare between

Table 3. *T*-tests for differences in language use between groups of childcare use

		<u>Reported Dutch language use</u>				<u>Reported Turkish language use</u>			
		Mean	(SD)	<i>t</i> -value	<i>p</i> -value	Mean	(SD)	<i>t</i> -value	<i>p</i> -value
Childcare (Time 1)	Yes	2.65	(1.13)			3.04	(0.92)		
	No	2.30	(0.96)	-1.52	.13	2.97	(0.76)	-0.34	.73
Childcare (Time 2)	Yes	3.07	(0.76)			2.74	(0.86)		
	No	2.66	(0.96)	-2.24	.03	2.85	(0.75)	0.60	.55

Time 1 and Time 2 as compared to children who have never been in childcare,  $F(1, 65) = 5.16, p < .05$ . Differences in the increase of Dutch between the other groups were not significant ( $F(1, 59) = .66, p = .42$  for no childcare vs. already in childcare at Time 1;  $F(1, 44) = 1.33, p = .26$  for start of childcare vs. already in childcare at Time 1).

In subsequent analyses interaction terms for start of childcare and percentage of non-Western immigrants were entered in repeated-measures ANOVAs as well, but this interaction term was not significant ( $F(1, 83) = 2.92, p = .09$ ).

Other factors did not significantly affect the change in reported language use with the child over time; these factors include maternal education ( $F(1, 85) = 0.01, p = .91$ ), mothers' emotional connectedness to the Dutch culture ( $F(1, 85) = 1.72, p = .19$ ), or to the Turkish culture ( $F(1, 85) = 0.32, p = .57$ ), and maternal sensitivity at Time 1 ( $F(1, 85) = 0.04, p = .84$ ) or Time 2 ( $F(1, 85) = 0.42, p = .52$ ). The decrease in reported use of the Turkish language with the child was not significantly affected by any of these factors.

## DISCUSSION

The amount of Dutch used in mother-toddler communication increased significantly between ages two and three. Mothers of children who started visiting childcare or who lived in a neighborhood with a low percentage of non-Western immigrants showed a larger increase in use of the Dutch language with their toddlers. The language use of mothers in communication with their toddlers was not related to maternal education, maternal sensitivity, or percentage of non-Western immigrants in the neighborhood. We did find evidence that mothers who felt more strongly connected to the Turkish culture spoke more Turkish and less

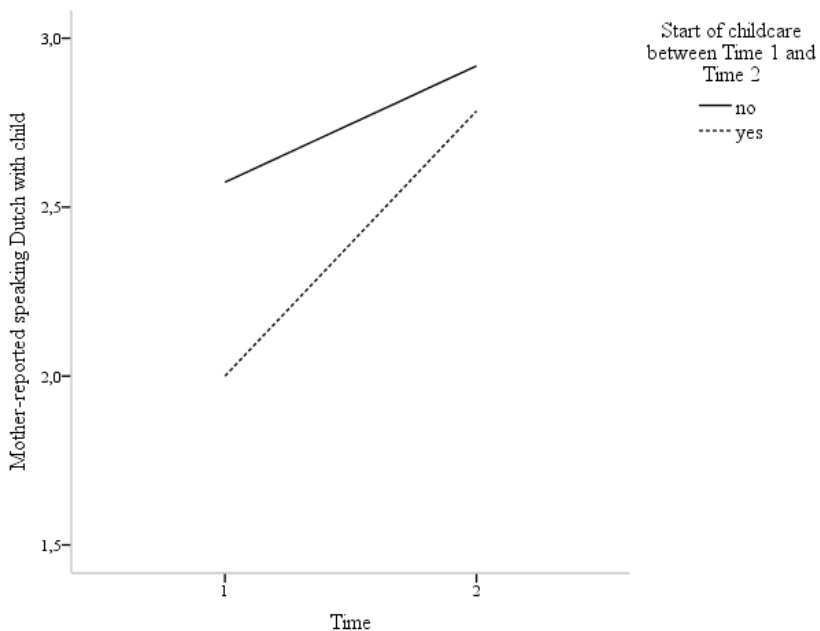


Figure 1. Change in reported Dutch language use with child over time for children who did and did not start childcare between Time 1 and Time 2

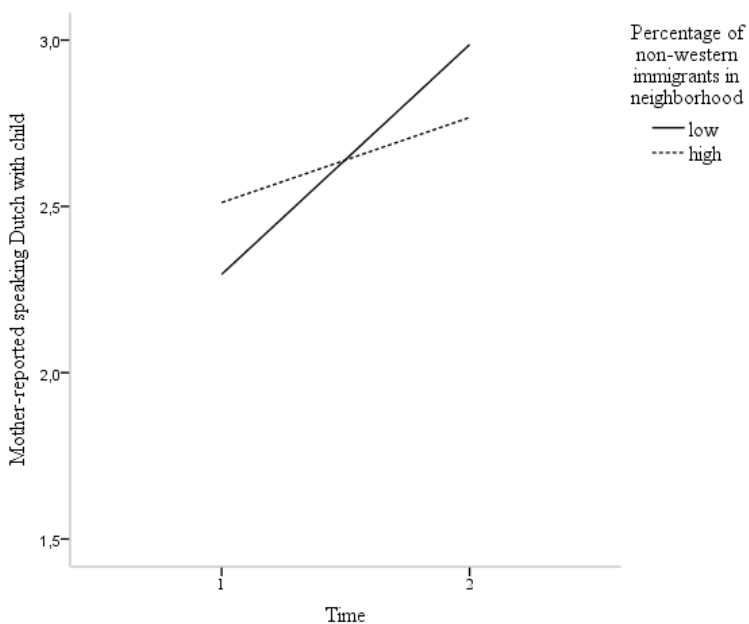


Figure 2. Change in reported Dutch language use with child over time for mothers from neighborhoods with a high or low percentage of non-Western immigrants



Dutch with their toddlers. Language use and ethnic identity were measured independently, since the PAS does not include any questions regarding language nor does the language scale include questions about culture.

The finding that the use of the Dutch language increased between age two and age three is in line with previous studies among Turkish preschoolers and their mothers in the Netherlands (Leseman, 2000) and Spanish bilingual mothers with their toddlers in the United States (Hammer et al., 2009). In these studies and in the current study the start of attending childcare was found to influence the increase in use of the host language. This can be explained by the predominant use of the host language and often deliberately language-stimulating environment that childcare facilities offer. In the Dutch situation, this leads to an increase of use of the Dutch language by the child, not only in the childcare setting, but also in the home situation. That in turn triggers mothers to use more Dutch in the communication with their children (see Figure 3). Thus, even toddlers to some extent create their own home language environments through their choice of language in daily communication, which is influenced by the language context outside the home. This has also been found to be true for Spanish-speaking children in the United States (Fillmore, 1991).

Whether this increase in use of the host language is positive or negative for the children's development is questionable. Increase in use of the host language of mother with her child has been found to have a negative impact on children's vocabulary in the ethnic language (Hammer, Davison, Lawrence, & Miccio, 2009; Fillmore 1991). More specifically, if the exposure to either the host or the ethnic language falls below a certain limit, a bilingual child will not acquire full competence in that particular language (Genesee, 2008). If a child does not develop the ethnic language well, this can have long-term effects on the social, emotional and academic development and family dynamics (Kohnert, Dongsun, Nett, Pui Fong, & Duran, 2005). However, it can be expected that the third-generation toddlers in this study will eventually use the Dutch language more than their second-generation mothers (Hakuta & D'Andrea, 1992). Maternal use of the host language was unrelated to children's vocabulary and emergent literacy development in the host language in a sample of children who were visiting Head Start and kindergarten classrooms (Hammer et al., 2009). Therefore, it might not be desirable if mothers keep increasing their use of the host language with their children, because that might lead to loss of ethnic language development. For host

language development, the children's (pre)school environment is likely to provide sufficient opportunities. To our knowledge, this relation between increase of host language use and ethnic language maintenance or loss has not yet been investigated in the Turkish population in the Netherlands.

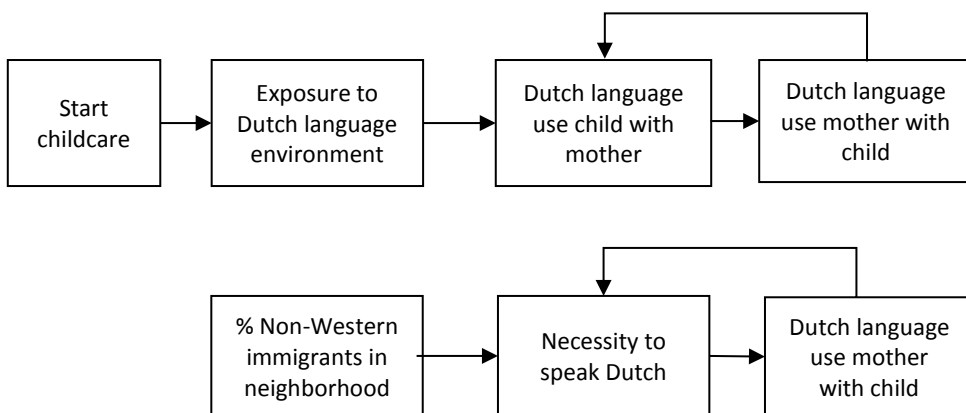
Mothers of children who lived in a neighborhood with a low percentage of non-Western immigrants showed a larger increase in use of the Dutch language with their toddlers; possibly, the Dutch language is more prominent in a neighborhood with a lower percentage of non-Western immigrants. This means that the child is exposed to the Dutch language in a greater variety of situations, which makes it more likely that mother and child will use the Dutch language more often in their communication (see Figure 3).

Education is more strongly associated with an increase in language ability than with language use (Van Tubergen & Kalmijn, 2009), which might be the reason that no relation between education and maternal language use was found in our study. Maternal sensitivity did not significantly affect the increase in Dutch language use. To our knowledge, there are no other studies investigating this association in ethnic minority families. However, one study showed that language use patterns in the ethnic and host language of adolescents and their parents were not related to the quality of the parent-adolescent relationship (Oh & Fuligni, 2010). In other words, although a more sensitive mother might stimulate her child's language development more by making efforts towards verbal engagement and providing language input (Hoff, 2006), this does not necessarily mean that she speaks either the ethnic or the host language more frequently with her child.

The language use of second-generation Turkish immigrant mothers with their toddlers was found to differ significantly from mothers' language use with important others. It is notable that Turkish mothers spoke more Dutch with their own brothers and sisters than with their children. The habit to speak Dutch with their brothers and sisters might originate from mothers' youth; previous research has shown that second-generation adolescents were more likely than first-generation adolescents to speak in the host language with their peers (Oh & Fuligni, 2010) and young Turkish people switched to the Dutch language with their siblings in their home situation (Extra & Yağmur, 2010).

The current study has some limitations. First, the sample size and the response rate were moderate (60%). We could have increased this sample size by imputing missing data if complete scales were missing, but that would have

increased the risk of bias. The moderate response rate may have resulted in low representativeness of the general Turkish population. However, the educational level in our sample was comparable with national data on educational level of the second-generation Turkish immigrant group in the Netherlands. Maternal education was used as an indicator of SES in this study, although it covers only part of the total concept of SES. Another limitation is the fact that only language use by the mothers was measured, and not language proficiency. It is known that language exposure in itself is not sufficient for a child to develop the language well (Meisel, 2004). Furthermore, no child language variables were measured. The potentially mediating role of the children's language use in the association between environmental factors and maternal language use should be addressed in future research. This could be done by looking at the language use of the children in the video observations. Also, language use was measured at just two time points. If three or more time points would have been included in this study, it would be possible to get more insight in the process of change in language use. Lastly, only reported measures of maternal language use were included in the analyses. However, language use reported by mothers converged with observed language use. The reported language use measure had the advantage that it measured both the Dutch and the Turkish language independently and referred to overall language use with the child.



*Figure 3.* Explanation models for the influence of the start of childcare and the percentage of non-Western immigrants on the increase of mothers' Dutch language use with the child

Our findings may help professionals supporting ethnic minority children's language development. It will be helpful for anyone working with bilingual children and/or their parents to have insight in the influence of environmental factors on maternal language use patterns when supporting bilingual children's language development or advising parents about the most optimal language context for their situation. The host language is important for children in their school environment and daily life in the host country, whereas the maintenance of the ethnic language can be important in the home environment and is part of the children's cultural background. Studies in other countries and with other ethnic groups have shown that mothers' increase of the host language use with their children might be at the expense of developing ethnic language skills but without any significant benefit for the children's host language development (Hammer et al., 2009; Kohnert et al., 2005). If the same is true for Turkish mothers in the Netherlands, informing these mothers about such processes is desirable. Parents could be informed about the environmental factors that influence their language use with their children so that they can make a choice which fits their personal situation and find an appropriate balance between the use of the ethnic and the host language. Also, for professionals working in childcare it is important to be aware of their influence on the language use pattern between bilingual mothers and their children, both directly and indirectly.

In conclusion, our findings show an increase over time in maternal language use in communication with their toddlers. This increase is stronger for families that live in neighborhoods with fewer non-Western immigrants and when children have started in childcare in the past year.



# Chapter

# 4

**Predicting ethnic minority children's vocabulary  
from socioeconomic status, home language and  
reading input:**

**Different pathways for host and ethnic language**

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## ABSTRACT

When bilingual children enter formal reading education, host language proficiency becomes increasingly important. This study investigated the relation between socioeconomic status (SES), maternal language use, reading input and vocabulary in a sample of 111 six-year-old children of first- and second-generation Turkish immigrant parents in the Netherlands. Mothers reported on their language use with the child, frequency of reading by both parents and availability of children's books in the ethnic and the host language. Children's Dutch and Turkish vocabulary were tested during a home visit. SES was related to maternal language use and to host language reading input. Reading input mediated the relation between SES and host language vocabulary and between maternal language use and host language vocabulary, whereas only maternal language use was related to ethnic language vocabulary. During transition to formal reading education, one should be aware that children from low-SES families receive less host language reading input.

**Keywords:** bilingual; reading; home literacy environment; SES; ethnic minority

## INTRODUCTION

Parents in bilingual ethnic minority families have the opportunity to expose their children to two languages: the language of their country of origin, the ‘ethnic language’, and the language of the country in which they live, the ‘host language’. Stronger maintenance of the ethnic language at the expense of the host language reflects a stronger ethnic identity (Extra & Yağmur, 2010; Oh & Fuligni, 2010) and enables children to communicate with family members who do not speak the host language. The host language becomes increasingly important once children enter formal education in general, and formal reading education in particular (Uccelli & Páez, 2007). Families with a higher socioeconomic status (SES) engage their children more often in home literacy activities (Kalia & Reese, 2009; Hindman & Morrison, 2012) and are more likely to use the host language (Arriagada, 2005; L. Q. Dixon, Wu & Daraghmeh, 2012). Language input in turn can positively influence the children’s vocabulary levels within the language in which the input is provided (Quiroz, Snow & Zhao, 2010; Mancilla-Martinez & Lesaux, 2011; Hoff, Core, Place, Rumiche, Señor & Parra, 2012) and also across languages (Roberts, 2008). To date, studies on the relation between SES, home language input, and vocabulary have been conducted in a variety of multilingual samples (Arriagada, 2005; Kalia & Reese, 2009; Quiroz et al., 2010; Mancilla-Martinez & Lesaux, 2011; L. Q. Dixon et al., 2012; Hoff et al., 2012). However, none of these specifically focused on the role of reading input in the relation between SES, language input and vocabulary in bilingual children who are about to make the transition to formal reading education. In the current study, we examine the influence of SES on maternal language use, home reading input and children’s vocabulary outcomes, both within and across languages, in a sample of families with a Turkish background and their six-year-old children in the Netherlands.

Children tend to have a larger vocabulary if they receive more learning stimulation in general (Bradley, Corwyn, Burchinal, McAdoo & García Coll, 2001) and reading stimulation in particular (Bus, Van IJzendoorn & Pellegrini, 1995; Hood, Conlon & Andrews, 2008). Reading input at home can also positively influence children’s emergent literacy skills (Bus et al., 1995). Children from families with a higher SES are often raised in more stimulating home environments, with more reading activities and books available (Guo & Harris, 2000; Bradley, Corwyn, McAdoo & García Coll, 2001; Korat, Klein & Segal-Drori,

2007; Crosnoe, Leventhal, Wirth, Pierce, Pianta & NICHD Early Child Care Research Network, 2010; Hindman & Morrison, 2012), and show higher language proficiency (Hoff, 2006). This pattern can be explained by processes described in the Family Stress Model and the Family Investment Model (Conger & Donnellan, 2007). The Family Stress Model proposes that families with a lower SES often have to deal with multiple stressors as a consequence of economic hardship. The Family Investment Model proposes that families with a lower SES have fewer economic and educational resources available than families with a higher SES. Due to the multiple stressors and fewer resources, these families are less likely to engage in shared book reading activities (Hoff, 2003; L. Q. Dixon et al., 2012). In previous research, evidence has been found for a mediating effect of language input in the relation between SES and children's cognitive outcomes, including vocabulary (Guo & Harris, 2000; Hoff, 2003; Mistry, Biesanz, Chien, Howes & Benner, 2008; Kloosterman, Notten, Tolsma & Kraaykamp, 2011).

Children in bilingual families generally receive less exposure to one particular language than children from monolingual families, because their parents need to divide language input between two languages (Hoff et al., 2012). Bilingual children usually show higher vocabulary scores in the language that they are exposed to most frequently (Quiroz et al., 2010; Mancilla-Martinez & Lesaux, 2011; Hoff et al., 2012). A positive influence of reading stimulation on vocabulary in both the ethnic and the host language has also been found for bilingual children (Kalia & Reese, 2009; Quiroz et al., 2010). Storybook reading in the home is effective for promoting host language vocabulary acquisition, independent of the language in which the reading takes place, and the availability of books in the host language is related to vocabulary in that language (Roberts, 2008). Similar to findings in monolingual samples, bilingual families with a higher SES engage their children in more reading activities (Kalia & Reese, 2009).

Not only the frequency of reading activities but also the language that is used for these activities in bilingual families can be related to SES. Low-SES ethnic minority parents are likely to be less proficient in the host language as a result of their lower educational level, which in turn restricts their access to higher-level jobs in the host country (L. Q. Dixon et al., 2012). Because of their lower host language proficiency and the larger likelihood of living in neighborhoods with more non-western immigrants where use of the host language is often not required, low-SES ethnic minority families tend to use their ethnic language more



than high-SES ethnic minority families (Arriagada, 2005). However, because high-SES parents tend to provide more language input overall, their children may be stimulated in the ethnic language more often than children from low-SES families (Arriagada, 2005). Thus, two processes operate in opposite directions in creating SES-related differences in ethnic language use, whereas for host language use the difference between low- and high-SES families are more straightforward. As is the case for language input, effects of SES on language outcomes can also differ for the host and the ethnic language. In previous research involving Spanish-English bilingual children a significant effect of maternal education was found for vocabulary in the host, but not in the ethnic language (Quiroz et al., 2010).

In addition to the influence of SES, and language and reading input on language proficiency, it has been suggested that input and proficiency in the host and the ethnic language can positively influence each other. Evidence for such a cross-language effect has been found in several previous studies with bilingual children (Yeung, Marsh & Suliman, 2000; Verhoeven, 2007; Mancilla-Martinez & Lesaux, 2011). However, in some studies this cross-language effect was restricted to higher-level skills, such as complex syntax, and was not found for specific language elements, such as vocabulary (Verhoeven, 1994; Uccelli & Pérez, 2007). The difference between the skill levels might be explained by the fact that higher-level skills are more dependent on underlying individual differences that are independent of the language that is used, such as cognition, while development of the more specific language elements depends more on aspects that are characteristic of a particular language and is therefore less likely to be transferred from one language to the other (Cummins, 1991).

The Turkish population is the largest ethnic minority in the Netherlands and a relatively large part of this group (more than 10%) consists of children younger than seven years (Central Bureau of Statistics, 2010). In the Netherlands, the ethnic Turkish are overrepresented in the lower socio-economic classes. In this ethnic minority, first- and second-generation immigrants have been found to identify themselves more with their own ethnic culture than with their host culture (Phinney, Horenczyk, Liebkind & Vedder, 2001). Turkish ethnic minorities are mostly in contact with persons with a similar ethnic background and generally marry within their own ethnic group, and about 30 to 40% of first-generation and 10 to 20% of second-generation Turkish immigrants even never have contact with people from the Dutch majority in their leisure time (SCP, 2009; SCP, 2011). It is

thus not surprising that both the Dutch majority group as well as Turkish ethnic minorities themselves judge Turkish ethnic minorities as culturally different from the Dutch majority group (Verkuyten, Hagendoorn & Masson, 1996). The Turkish language is perceived as a core cultural value even after the first immigrant generation (Extra & Yağmur, 2010). The language use pattern in Turkish families is generally characterized by Turkish dominance with a change towards more use of Dutch that starts when children enter childcare or preschool (Leseman, 2000; Prevoo, Mesman, Van IJzendoorn & Pieper, 2011). Dutch primary schools do not provide education in Turkish, and many schools even apply a rule stating that the children should speak Dutch with each other when at school (NVLF, 2006).

For Turkish-Dutch bilingual children research results on the relations between SES, language and reading input and vocabulary are ambiguous. In one study with Turkish-Dutch 3-year-old children, a positive relation between literacy activities in the home and children's cognitive development, including Turkish vocabulary, was found (Leseman & Van den Boom, 1999), whereas in another no relation between reading input and vocabulary in either the ethnic or the host language was found for Turkish-Dutch children of the same age as in the other study (Scheele, Leseman & Mayo, 2010). In a study investigating the language environment and proficiency of Turkish-Dutch children, no relation between SES and language input or vocabulary in either language was found (Scheele et al., 2010). Evidence for cross-language transfer from ethnic to host language has been found in a previous study with Turkish-Dutch children (Scheele et al., 2010).

In our study we focus on the language and reading input and vocabulary in both ethnic and host language of six-year-old children with a Turkish background who are about to make the transition to formal reading education in the Netherlands. The language proficiency level with which a child enters formal reading education is important for the development of reading skills (Roth, Speece & Cooper, 2002; Lonigan, Schatschneider & Westberg, 2008; Davison, Hammer & Lawrence, 2011). For bilingual children it is not only their overall language proficiency, including vocabulary, that is important in this phase of their educational career, but more specifically their proficiency in the language in which they learn to read (Bialystok, 2004). If children enter formal reading education with a host language vocabulary level that is too low, they will certainly encounter difficulties in learning to read (Uccelli & Páez, 2007). Furthermore, insight into the home literacy environment and language proficiency in both

languages of bilingual children who are about to make a major educational transition, can yield important information for the improvement of children's language and literacy development in such a vital phase of their school career.

In this study, we examine to what extent the relation between SES and vocabulary in both ethnic and host language of six-year-old Turkish-Dutch children is mediated by the language and reading input in either language. We hypothesize that family SES and home language and reading input will be positively related to children's Dutch and Turkish vocabulary. More specifically, we expect SES to predict maternal language use, which predicts home reading input in a particular language, which in turn predicts vocabulary in that language. In examining a possible cross-language effect, we take an exploratory approach, because previous research findings are too ambiguous to allow a firm hypothesis.

## METHOD

### Participants and procedure

Data for the current study were collected from ethnic Turkish mothers in the Netherlands with their five- or six-year-old children, who were about to make the transition to formal reading education. The sample consisted of 111 ethnic Turkish mothers and their children. These mothers were recruited from the municipal registers of several cities and towns in the western and middle region of the Netherlands. To make sure that all mothers in our sample had at least part of their education in the Netherlands, we selected second-generation Turkish immigrant mothers who were born in the Netherlands (with at least one of their parents born in Turkey), or first-generation Turkish immigrant mothers who moved to the Netherlands before the age of 11, and who had children who were in the 2<sup>nd</sup> year of Dutch primary school—which corresponds to the kindergarten year in the U.S.—at the time of the home visit (age 5;5-6;10 years). Furthermore, if the child's father had a background other than Turkish, the family was excluded. Fathers could be either first- or second-generation Turkish immigrants and there was no restriction regarding the age of arrival in the Netherlands for fathers.

In total, 639 families were reached of whom 113 (18%) agreed to participate. Two respondents had to be excluded for this study, because Kurdish was spoken at home. A subgroup of mothers that did not want to participate ( $N = 153$ ) provided some general information about their families by filling out a

form. These families did not differ significantly from the participating families in age of father ( $p = .38$ ), mother ( $p = .11$ ) and child ( $p = .36$ ), child's gender ( $p = .13$ ), total number of children in the family ( $p = .81$ ), birth rank of the participating child ( $p = .18$ ), country of birth of mother ( $p = .79$ ) and father ( $p = .86$ ), mother's marital status ( $p = .68$ ), and child's family status ( $p = .75$ ).

The participating parents completed questionnaires and mother and child participated in a two-hour home visit including a mother interview, child testing and video observation. The children had a mean age of 6;1 years ( $SD = 3.7$  months) at the time of the home visit. Forty-one percent of the sample consisted of boys. The mothers had a mean age of 33;1 years ( $SD = 4;3$ ). Thirty-three percent of the mothers and 84% of the fathers were born in Turkey. The mothers who were born in Turkey migrated to the Netherlands at a mean age of 5;7 years ( $SD = 3;10$ ), whereas fathers who were born in Turkey migrated to the Netherlands at a mean age of 19;8 years ( $SD = 8;9$ ). Most children lived in two-parent families with both their biological parents (91%). The majority of the children had one sibling (58%), 11% had no siblings, and 31% had two or more siblings. Fifty-six percent of the children were the first-born child in their family.

Almost half of the mothers (49%) reported speaking an equal amount of Dutch and Turkish with their child, 42% mostly or only Dutch, and 9% reported speaking mostly or only Turkish to their child. On the contrary, most mothers (41%) reported speaking mostly Turkish with their partner, and only 10% of the mothers reported speaking mostly or only Dutch with their partner. Of the 66 fathers who filled out the father questionnaire, 35% reported speaking an equal amount of Dutch and Turkish with their child, 18% mostly Dutch, and 47% reported speaking mostly or only Turkish to their child. In the families where both fathers and mothers filled out the questionnaires, fathers reported speaking significantly more Turkish to their child than mothers did ( $t(64) = 7.13, p < .001$ ). Most mothers reported that they could speak and read Dutch (89% speaking; 94% reading) and Turkish (75% speaking; 76% reading) very well. Most fathers who filled out the father questionnaire also reported that they could speak (86%) and read (83%) Turkish very well. Almost half of the fathers reported that they could speak (42%) and read (49%) Dutch very well.

## Measures

Questionnaires were available in the Dutch and the Turkish language. All questionnaires in this study were translated from Dutch into Turkish and back-translated in order to ensure correct wording in the Turkish language. Most mothers (91%) chose to complete the Dutch version of the questionnaire. This may be explained by the fact that all second-generation Turkish mothers have attended school in the Netherlands, and are thus more used to written communication in Dutch, even though they may prefer Turkish for spoken communication (Yaman, Mesman, Van IJzendoorn & Bakermans-Kranenburg, 2010b).

### *Socioeconomic status (SES)*

Family SES was based on the family's annual gross income and the highest completed educational level of both parents. The annual gross income was measured on a 7-point scale (1 = no income; 2 = less than €10,000; 3 = €10,000-20,000; 4 = €20,000-30,000; 5 = €30,000-40,000; 6 = €40,000-50,000; 7 = more than €50,000). Parents' highest completed education was also measured on a 7-point scale (1 = no qualification; 2 = primary education; 3 = lower vocational education; 4 = intermediate vocational education; 5 = secondary education; 6 = higher vocational education; 7 = university level degree). Because factor analysis showed that maternal and paternal educational levels and annual family gross income loaded on a single factor (loadings of .83, .79, and .81 respectively), SES was computed as the mean of the standardized values of the income and education variables. If one or two of the SES variables were missing, the values of the missing variables were computed based on a regression equation that included the available values as predictors of the missing value, before computing the SES variable. For two families only father's education was missing. Four families had missing values for both father's education and annual income. For 21 families annual income was missing while education levels were available, in most cases because mothers found their family income too confidential to report.

### *Relative maternal ethnic language use*

Mothers reported on a 5-point scale (1 = only Dutch; 2 = more Dutch than Turkish; 3 = equal amount of Dutch and Turkish; 4 = more Turkish than Dutch;

5 = only Turkish) how often they used the ethnic relative to the host language when speaking with their child.

### ***Reading input***

Reading by mother and father, and the availability of children's books in the home were taken as indicators of the reading input the child received. Questions were taken from the questionnaire 'Watching television, reading and computers at home' from the Study of Early Child Care and Youth Development (SECCYD) of the National Institute of Child Health and Human Development (NICHD). Translation into Dutch and back-translation to English were used to ensure correct wording in Dutch of the original English questions. Turkish mothers were asked to indicate on a 5-point scale (0 = never; 1 = once per month or less; 2 = once per week; 3 = several times per week; 4 = every day) how often they themselves and their partners read to the target child. When mothers referred to their partner this was always the child's father, because all children in our sample who lived in a two-parent household lived with both biological parents. The availability of children's books was measured on a 4-point scale (0 = none; 1 = less than 10; 2 = 10-30; 3 = 30 or more). Mothers were asked to indicate which language was used for reading by both parents and what the language was of the available children's books on the same 5-point scale that was used for relative maternal ethnic language use, ranging from 'only Dutch' to 'only Turkish'.

In order to get separate reading input scores for the ethnic and the host language a score of 1 was given if the target language was always used, 0.75 if the target language was mostly used, 0.50 if both languages were used equally, 0.25 if the other language was used more often than the target language, and a score of 0 was given if the target language was never used for the particular indicator, in accordance with the calculation used by Scheele, Leseman, and Mayo (2010). These scores for language use in each of the languages were then multiplied with the frequencies of the three indicators, yielding scores ranging from 0 to 4 for reading by both parents and a score ranging from 0 to 3 for the availability of children's books.

As a result of the multiplication, gaps between possible scores are larger as the frequency becomes higher. To prevent these gaps in the distribution that might cause problems for structural equation modeling, the reading input scores were grouped into four categories (0 = no input; 1 = low input; 2 = medium

input; 3 = high input). Categorical regression analysis (Meulman & Heiser, 1999) with relevant correlates of reading input (language use, SES, vocabulary) on a numerical measurement level was used to determine which scores could be taken together into one category. Categorical regression is comparable to linear regression analysis with transformed variables (for instance, log transformations); the main difference is that, according to criteria controlled by the researcher, the method finds the transformation that best represents the relation between predictors and response. The scores that were shown to represent the same values in the transformation plots were grouped together. Based on these analyses all reading input scores between 0.25 and 1 were taken together in the low input category, 1.5 to 2 in the medium input category, and input scores between 2.25 to 4 constituted the high input category. For the availability of children's books this category division, based on categorical regression analyses, was 0.25-0.75, 1-1.5, and 2-3. Scores of 0 on any of the reading input variables were not recoded, in order to keep the distinction between no reading input and some input. It should be noted that the categorical regression analyses also confirmed that different scores on the two components of reading input that lead to the same outcome (e.g. a score of 2 could be based on  $2*1$  or  $4*0.5$ ) could fall into the same reading input category, because each possible combination was given a different value in the analysis but combinations that lead to the same outcome still appeared at the same level in the transformation plots. Because the scores for both languages were based on multiplication of the same raw variables, input sources in each of the languages were interrelated:  $r = -.29$ ,  $p = .005$  for reading by mother;  $r = .32$ ,  $p = .002$  for reading by father;  $r = -.39$ ,  $p < .001$  for availability of children's books. Interestingly fathers' reading in the two languages was positively correlated, which may be due to the low overall frequency of their reading. However, if they read they tend to do so in both languages.

### ***Dutch vocabulary***

To measure Dutch expressive vocabulary, the Expressive One Word Picture Vocabulary Test (EOWPVT; Brownell, 2000) was translated into Dutch. In this test, a picture is shown and after a prompting question from the researcher the child has to name the picture in one word. All test administrations were audio-recorded to be able to decide on the scoring afterwards in case of ambiguous

answers. Based on pilot assessments of the Dutch translation of this test, the decision was made to replace the map of the United States with a map of the Netherlands and to delete items 118 (*reel*), 146 (*prescription*) and 160 (*monocular*) for which no appropriate Dutch translation was available. Item-response analyses showed that this Dutch version of the test captured basically the same increase in difficulty level that is present in the original English version. The split-half (odd/even) sample reliability was  $> .99$ .

### ***Turkish vocabulary***

Because bilingual children have been shown to have difficulties accessing their productive vocabulary in their ethnic language in the circumstance of immersion in the host language (Gibson, Oller, Jarmulowicz & Ethington, 2012), a receptive vocabulary measure was most appropriate for the Turkish language. To measure Turkish receptive vocabulary, the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 2007) was translated into Turkish (Glück, 2009). In this test, four pictures are shown and the child is asked to select the picture that matches a spoken word. Because not all research assistants administering the child tests spoke the Turkish language, the Turkish pronunciation was recorded beforehand and children heard the Turkish word as soon as the four pictures that they could choose from were shown on the computer screen. If necessary, the child could ask the assistant to play the recorded word one more time. Item-response analyses showed that despite some variance in difference levels within sets, the increasing difficulty level from one set to the other that is present in the original English version was captured in this translation. The split-half (odd/even) sample reliability was .98.

### **Analyses**

First, correlations were computed to explore the relations between SES, maternal language use and reading input in Dutch and Turkish, and children's vocabulary scores in each of the languages. Structural equation modeling (SEM) with EQS 6.1 (Bentler, 2001) was used to test the hypothesized mediations. The chi-square goodness of fit test, the Bentler-Bonnett normed fit index (NFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) were used to evaluate the model fit. Model fit was considered to be satisfactory when the chi-square statistic was not significant at  $p < .05$ , fit indices (NFI and CFI)  $> .95$ , and



RMSEA < .10 (Schermelleh-Engel, Moosbrugger & Müller, 2003). Issues of missing data in the SEM-analyses were dealt with by using Full-Information Maximum Likelihood (FIML) estimation procedures. Outliers were winsorized to be equal to the next highest value of the particular variable (W. J. Dixon, 1960).

## RESULTS

### Descriptives

Descriptive statistics of the main variables are reported in Table 1. The results show that mothers spoke on average somewhat more Dutch than Turkish to their children, as is shown by the mean which is below the scale midpoint. Also, children in our sample received significantly more Dutch reading input as compared to Turkish reading input by their mothers ( $t(95) = 12.47, p < .001$ ), fathers ( $t(94) = 2.41, p = .02$ ) and through the availability of children's books ( $t(92) = 11.28, p < .001$ ). Reading by fathers provided least input in both languages. This is caused by the low overall frequency of reading by fathers, who on average read about once a month ( $M = 1.33, SD = 1.25$ ), which is included in the computation of the input in each of the languages. Despite the low means for the Turkish variables, the entire range of possible reading input scores was present in our sample. There were no differences between first or second immigrant generation mothers in language use with their child ( $t(106) = -0.82, p = .42$ ), nor were there any differences in Dutch reading input between first- and second-generation mothers ( $t(92) = -0.04, p = .97$ ) or fathers ( $t(87) = -0.81, p = .42$ ). For Turkish reading input, there were no differences between first and second generation mothers ( $t(92) = 0.43, p = .67$ ), but there was a difference for fathers. First-generation fathers provided significantly more Turkish reading input to their children than second-generation fathers ( $t(28.20) = 2.20, p = .04$ ). However, in families with fathers born in Turkey there was no difference in the availability of children's books in Dutch ( $t(87) = -0.13, p = .90$ ) or Turkish ( $t(87) = 0.59, p = .56$ ) as compared to families with fathers born in the Netherlands. There were no differences between boys and girls in any of the reading input sources or vocabulary scores in the ethnic or host language ( $0.13 < |t| < 1.57, p > .05$ ).

Table 1. *Descriptive statistics of reading input, vocabulary and SES.*

	<i>n</i>	Range	<i>M</i>	( <i>SD</i> )
Family SES	111	-2.1-1.8	0.01	(0.83)
Mother's highest education	111	1-7	4.27	(1.42)
Father's highest education	111	1-7	4.26	(1.44)
Annual gross income	111	1-7	4.76	(1.53)
Relative maternal ethnic language use	109	1-7	2.63	(0.74)
Reading input				
Dutch reading by mother	95	0-3	2.39	(0.76)
Dutch reading by father	95	0-3	0.95	(1.03)
Dutch children's books	94	0-3	2.25	(0.71)
Turkish reading by mother	94	0-3	0.81	(0.78)
Turkish reading by father	92	0-3	0.68	(0.77)
Turkish children's books	92	0-3	0.88	(0.69)
Vocabulary scores				
Dutch (EOWPVT)	109	22-90	46.70	(12.57)
Turkish (PPVT)	106	11-124	54.65	(25.53)

*Note.* Relative maternal ethnic language use ranges from 1 = only Dutch, to 5 = only Turkish

### Associations between main variables

Before analyzing the proposed models, the correlations between SES, maternal language use, reading input, vocabulary scores, and the child's age were explored (see Table 2). SES showed a significant positive correlation with Dutch reading by mother and availability of Dutch children's books, as well as with the Dutch expressive vocabulary scores, and a significant negative correlation with relative maternal ethnic language use. There were no significant correlations between SES and any of the Turkish input variables or Turkish vocabulary. SES was also positively related to the overall frequency of reading by mother and the overall number of children's books available in the home, but not to the language that was used for these reading activities.

The input variables were almost all significantly and positively intercorrelated within the languages. Relative maternal ethnic language use was positively related to Turkish vocabulary and negatively to Dutch vocabulary, meaning that children's Turkish vocabulary was generally higher and their Dutch vocabulary lower when their mothers spoke relatively more Turkish to them. All Dutch reading input variables showed significant positive correlations with Dutch expressive vocabulary, meaning that more reading input was related to higher Dutch vocabulary scores. For Turkish, only reading by father showed a significant

positive correlation with Turkish receptive vocabulary, while the other correlations were not significant ( $.05 < p < .06$ ). No significant cross-language correlations were present. However, the negative correlation between Dutch and Turkish vocabulary ( $r = -.19, p = .06$ ) indicated a trend towards competition between the languages.

Dutch vocabulary was significantly correlated with the child's age at the day of testing. Because translated versions of both vocabulary tests were used, no norm scores for vocabulary were available and raw scores had to be used. To control for a possible age effect on vocabulary outcomes, the residual scores, obtained after a regression analysis with age as predictor and vocabulary as outcome variable, will be used in further analyses for both the EOWPVT and the PPVT.

### Structural equation models

To examine the relations between SES, maternal language, and reading input and vocabulary, a structural equation model with SES, maternal language use, a latent factor representing reading input (indicated by reading by mother, reading by father, and availability of children's books), and vocabulary was tested in EQS for each of the languages. Because we expected the indicators of reading input to contribute equally to this construct, the coefficients for the (unstandardized) paths connecting the indicators with the factor were fixed to 1 for all indicators of the latent variable.

A model with paths from SES to all other variables, from maternal language use to reading input, and from all other variables to Dutch vocabulary fit the data,  $\chi^2(6, N = 111) = 6.26, p = .39, NFI = 1.00, CFI = 1.00, RMSEA = .07$ . However, in this model none of the paths leading to Dutch vocabulary were significant. Therefore, based on the Lagrange Multiplier test, the paths from SES to Dutch vocabulary and from maternal language use to Dutch vocabulary were removed. This led to the final model presented in Figure 1, which fit the data well,  $\chi^2(11, N = 111) = 9.33, p = .59, NFI = 1.00, CFI = 1.00, RMSEA = .04$ .

For the model with Turkish reading input and vocabulary the same steps were followed. A model with paths from SES to all other variables and from all other variables to Turkish vocabulary did not fit the data well,  $\chi^2(6, N = 111) = 10.29, p = .11, NFI = 1.00, CFI = 1.00, RMSEA = .11$ . The Lagrange Multiplier and Wald tests were used to determine what would be the most

Table 2. Correlations among SES, reading input, vocabulary and child's age.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	Mother	Father	Books
1. SES	-													
2. Dutch vocabulary (EOWPVT)	.38***	-												
3. Turkish vocabulary (PPVT)	.02	-.19	-											
4. Child's age at day of testing	-.04	.37***	-.04	-										
5. Relative ethnic language use	-.33***	-.42***	.38***	-.19	-									
6. Frequency of reading by mother	.26*	.10	.13	-.11	-.05	-								
7. Language of reading by mother	-.20	-.12	.19	-.01	.40***	.12	-							
8. Frequency of reading by father	.14	.23*	.05	-.04	-.05	.32**	.24*	-						
9. Language of reading by father	-.11	-.07	.33**	.17	.28*	.21	.59***	.02	-					
10. Number of children's books	.47***	.29**	-.03	-.08	-.21*	.44***	.03	.35**	.01	-				
11. Language of children's books	-.09	.00	.16	.02	.38***	.14	.67***	.18	.41**	.04	-			
Dutch reading by mother	.34**	.24*	-.04	-.10	-.33**	.70***	-.42***	.15	-.32**	.31**	-.33**	-		
Dutch reading by father	.16	.26*	-.07	-.09	-.16	.18	-.01	.83***	-.56***	.28**	-.01	.28*	-	
Dutch children's books	.35**	.24*	-.17	-.09	-.43***	.17	-.42***	.08	-.35**	.71***	-.60***	.40***	.19	-
Turkish reading by mother	-.11	-.15	.20	-.08	.42***	.26*	.94***	.22*	.62***	.08	.64***	-		
Turkish reading by father	.04	.12	.24*	.02	.14	.30**	.56***	.68***	.77***	.22*	.43***	.56***	-	
Turkish children's books	.05	.11	.21	-.03	.30**	.24*	.56***	.22*	.40**	.25*	.92***	.60***	.45***	-

Note. Because reading input in each of the languages is based on a reverse coding of the same variable, for the reading input variables only correlations within languages, not between languages, are presented in the last three columns of the table.

Relative maternal ethnic language use ranges from 1 = only Dutch, to 5 = only Turkish.

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

parsimonious model with the best fit. The relation between the latent variable Turkish reading input and Turkish vocabulary, which was tested with SEM, was significant ( $\beta = .29, p < .05$ ), but the path from reading input to vocabulary was removed in the final model. The paths from SES to reading input and vocabulary were also removed in the final model. Furthermore, the loadings of Turkish reading input by father and the availability of Turkish children's books were no longer restricted to be fixed on 1. The standardized loadings of the indicators of the latent variable were .94 for Turkish reading by mother, .59 for Turkish reading by father, and .65 for the availability of Turkish children's books. The final model is presented in Figure 2,  $\chi^2(10, N = 111) = 13.81, p = .18, NFI = 1.00, CFI = 1.00, RMSEA = .08$ .

## DISCUSSION

The results of the current study showed that mothers in families with a higher SES spoke more Dutch than Turkish to their child, that these families provided more Dutch reading input and that their children had a larger Dutch vocabulary. Maternal language use partially mediated the effect of the families' SES on Dutch reading input, which was in turn related to Dutch vocabulary. Maternal language use also mediated the effect of SES on Turkish reading input. Children had a larger Turkish vocabulary if mothers spoke more Turkish compared to Dutch with them.

The mediating role of host language reading input in the positive relation between SES and maternal language use and host language vocabulary was in line with our expectations. Previous research has shown a positive relation between home stimulation and cognitive outcomes for Turkish-Dutch children (Leseman & Van den Boom, 1999). We replicated this finding in an older age group and for reading input specifically. However, our results are not in line with studies showing only a marginal relation or no relation at all between reading input and vocabulary (Scheele et al., 2010; Hindman & Morrison, 2012). Although one of these studies was conducted in a Turkish-Dutch sample as well (Scheele et al., 2010), it should be noted that children in that study were younger and constituted a specific bilingual group receiving most of their input in their ethnic language.

The positive relation between relative maternal ethnic language use and Turkish vocabulary is in line with previous research in which the relative amount of input in a certain language was found to be related to the children's language

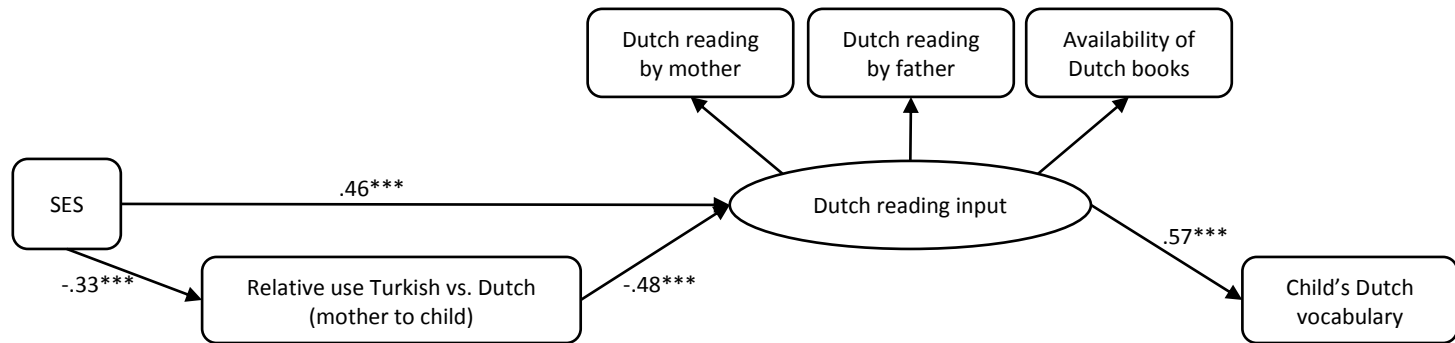


Figure 1. Structural equation model on the relation between SES, maternal language use, Dutch reading input and vocabulary

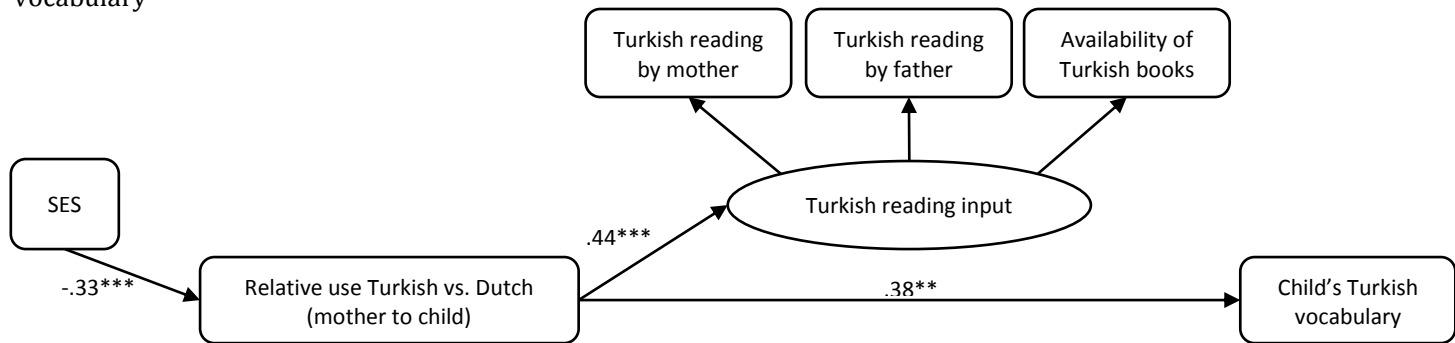


Figure 2. Structural equation model on the relation between SES, maternal language use, Turkish reading input and vocabulary

outcomes (Quiroz et al., 2010; Mancilla-Martinez & Lesaux, 2011; Hoff et al., 2012). The finding that there was no relation between SES and Turkish vocabulary is consistent with previous research in which a relation between maternal education and language proficiency was found for the host language only (Quiroz et al., 2010). There were only very few respondents reporting high Turkish reading input. Concurrently, only very few respondents reported low Dutch reading input. This was in line with the average relative ethnic language use that mothers reported, which also showed more use of Dutch than Turkish. Across all three sources of reading input (reading by mother, reading by father, and availability of children's books) Dutch was the language that was used most. Fathers who were born in Turkey were found to read more to their children in Turkish. This is in line with the previous finding that first-generation immigrants are more likely to use their ethnic language than second-generation immigrants (Hakuta & D'Andrea, 1992). The majority of fathers in our sample was born in Turkey and moved to the Netherlands at an older age than the mothers did. The Turkish mothers in this study are more used to written communication in Dutch, because they received most of their education in the Netherlands (Yaman et al., 2010b). It is possible that Dutch reading materials are more easily accessible or were promoted more as compared to Turkish ones, or that children invite more reading input in Dutch because this is the language that they use at school. The limited use of Turkish in general and for reading in particular can also be a result of an ongoing decrease in ethnic language use and increase in host language use, that starts with increased host language input in toddlerhood (Prevoe et al., 2011). Previous research has shown that the acceptance of the maintenance of the ethnic language in Dutch society is limited, even if people show a good host language proficiency in addition to the ethnic language maintenance (Vedder & Virta, 2005). If this low acceptance is clearly apparent within the community, parents across SES groups might prioritize host language development in their children above ethnic language development and therefore provide more input in Dutch than Turkish.

The processes underlying the effect of SES on Dutch language and reading input have been described in the Family Investment Model or the Family Stress Model (Conger & Donnellan, 2007). The Family Investment Model focuses on economic and educational resources. Although the economic resources are the same for both languages within families, the educational resources may vary for

the two languages. All mothers in our sample had most of their education in their host country, the Netherlands. Higher educated mothers will have had more exposure to the host language during their educational career. Differences in SES thus partly reflect differences in the extent to which mothers have been exposed to Dutch at school. For the ethnic language the differences in maternal language might not be so strongly related to SES, because this language was learned from other sources than school. For fathers this pattern is less clear, because it depends on the country where the father received most or all of his education whether a higher educational level is related to better proficiency in the host or the ethnic language. Also, higher educated parents might value host language development more, because they know how important it is from their own experience with the Dutch educational system, and therefore choose to stimulate the host language more. The Family Investment Model applies to our findings, albeit only regarding the investment of educational resources. The Family Stress Model focuses on the stress that parents experience as a result of economic hardship. In this study family stress was not measured, so firm conclusions on the applicability of the Family Stress Model cannot be drawn. However, multiple stressors experienced by low-SES parents may keep them from investing in balancing of the use of two languages and lead to the decision to use their mother tongue only. It should be noted that causal conclusions about the relation between SES, maternal language use, reading input and vocabulary cannot be drawn in our study, due to the cross-sectional design. It is possible that children with a higher vocabulary invite more input in a certain language or more reading input from their parents, instead of the other way around. However, that would not explain the relation between SES and Dutch vocabulary and between maternal language use and reading input.

In our correlational analyses we found that SES correlated positively with overall frequency of reading by mother and the overall number of children's books in the home, which is in line with previous research (Leseman & Van den Boom, 1999; Kalia & Reese, 2009; Hindman & Morrison, 2012). Conversely, we found that SES did not correlate significantly with the relative use of the ethnic language for any of the reading activities. Turkish vocabulary correlated positively with the language of reading by father. In other words, if fathers used more Turkish than Dutch for reading at home, the child's Turkish vocabulary was generally higher, regardless of the amount of reading with the father. Dutch vocabulary, on the other hand, correlated positively with overall frequency of



reading by father and the overall number of children's books. In a previous study, the effect of SES was even found to change direction once the language context in the home was added (Arriagada, 2005). As suggested in this previous study, we found that high-SES parents provide more overall reading input. We did not find, however, that low-SES parents use the ethnic language more for reading. Apparently, the choice to use the ethnic language for reading is influenced by other factors than SES.

Other explanations for differences between Turkish-Dutch families in Turkish reading input could be investigated further in future research. The birth order of the child could matter. Previous research in families with at least one first-generation immigrant parent has shown that the oldest child is more likely to speak the ethnic language than a later-born child (G. Stevens & Ishizawa, 2007; Obied, 2009). Another interesting focus could be a comparison of those who were exposed to two languages from birth (i.e., simultaneous second-language learners) versus those who were first exposed to the host language when they started (pre-)school (i.e., sequential second-language learners). Previous research has shown that mothers of simultaneous second-language learners engaged more often in language stimulating activities than mothers of sequential second-language learners (Hammer, Miccio & Wagstaff, 2003).

The observed trend towards competition between the host and the ethnic language that we found is contrary to previous studies, both in Turkish-Dutch samples and other bilingual samples, in which a positive relation between input or vocabulary in one language and vocabulary in the other language was found (Roberts, 2008; Scheele et al., 2010). Because what we found is only a trend, no firm conclusions can be based upon this finding. Some previous studies did not find a cross-language effect for vocabulary (Verhoeven, 1994; Uccelli & Páez, 2007). Although vocabulary has been shown to be dependent on language proficiency (Zareva, Schwanenflugel & Nikolova, 2005), it might be that measuring vocabulary only is too specific, because vocabulary is less indicative of a general underlying proficiency and more dependent on language-specific factors (Cummins, 1991) and on the presence of a particular word in the input environment of the child. Future research could take into account more aspects of language proficiency in addition to vocabulary to get a clearer picture of the influence that the ethnic and the host language might have on each other and the influence that language and reading input have on these aspects. It is also possible

that the positive effect of the ethnic on the host language only becomes visible at a later age (Yeung et al., 2000).

The current study has some limitations. First, despite all the effort that was put in recruitment of families for this study, the response rate was low. We did not only send letters in both Dutch and Turkish and brochures containing culturally adapted pictures, but also tried to personally contact the families. These are all important aspects in recruitment of ethnic minority respondents (Yancey, Ortega & Kumanyika, 2006). It should be noted that, paradoxically, more effort to reach possible participants could lead to a lower response rate. When eligible participants who are hard to reach refuse participation, the response rate is negatively affected, whereas with less recruitment effort, these potential participants would have remained unreached. Second, the tests that were used to measure Dutch and Turkish vocabulary did not provide norms for monolingual or bilingual children for the languages in which we used them and measured only one language modality for each language, expressive or receptive spoken language respectively. However, even if we had measured both languages with the same measures, they would not have been comparable (Hulstijn, 2012). Previous research has shown that book reading is more strongly related to expressive than to receptive language skills (Mol, Bus, de Jong & Smeets, 2008). This may explain why we found a pathway from reading input to Dutch but not to Turkish vocabulary. However, the receptive-expressive gap that is often present in bilingual children's vocabulary has been shown to be larger for the ethnic language (Gibson et al., 2012), making a receptive measure for the ethnic language a better indicator of the children's total vocabulary in that language. We did control for the child's age at the day of testing in analyses in which the test scores were used. A final limitation is that we did not take into account any language or reading input by other persons than the mother or father and that we did not measure the quality of the reading input in addition to the quantity of the input. It is possible that children are being read to by other persons in the home. Turkish-Dutch mothers tend to interact differently with their child during shared book reading as compared to native Dutch mothers (Bus, Leseman & Keultjes, 2000). It is known that rich explanations during shared reading activities have a positive influence on the words that the child learns from this activity (Collins, 2010) and that mother's reading ability mediates the relation between SES and children's

achievement (Sastry & Pebley, 2010). Still, none of the above would explain why SES is unrelated to Turkish vocabulary.

Our findings provide insight into the differences in language and reading input at home and how these relate to host and ethnic language proficiency of the children. When children are about to make the transition to formal reading education, the language in which children learn to read is important for the reading education to succeed (Bialystok, 2004). If children's vocabulary level in the host language is too low, they will encounter difficulties in learning to read (Uccelli & Páez, 2007). Across SES groups, advising parents to read with their children can have a positive effect for the host as well as the ethnic language, given the positive correlations between reading input and vocabulary within each of the languages. In light of the children's transition to formal reading education, extra attention should be paid to children from low-SES families, because the generally limited reading input in the host language that they are exposed to at home can put them at risk for slower host language vocabulary development and as a result also endanger their reading development.





# Chapter

# 5

**A context-dependent view on the linguistic  
interdependence hypothesis:  
SES and language use as potential moderators**

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Rosanneke A.G. Emmen

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## ABSTRACT

The *linguistic interdependence hypothesis* (Cummins, 1979) states that the development of skills in a second language (L2) partly depends on the skill level in the first language (L1). It has been suggested that the theory lacked attention for differential interdependence. In this study we test the hypothesis of *context-dependent linguistic interdependence* by examining child language use and SES as moderators in the relation between L1 vocabulary and L2 vocabulary growth, in a sample of 104 five- and six-year old bilingual children with a Turkish background in the Netherlands. Relative child language use moderated the relation between L1 vocabulary and L2 vocabulary growth. Positive transfer was only present for children who used L1 more than L2. The findings provide support for context-dependent linguistic interdependence.

**Keywords:** bilingualism, linguistic interdependence, SES, language use

## INTRODUCTION

An important theory in research on bilingualism is the *linguistic interdependence hypothesis* (Cummins, 1979), which states that for bilingual children the development of skills in their second language (L2) partly depends on their skill level in the first language (L1). Since the classic paper in which this hypothesis was explained, it has been suggested that the theory lacked attention for differential interdependence varying for different types of language skills, different levels of resemblance between languages, and different levels of contextual factors, such as language exposure (Proctor, August, Snow, & Barr, 2010; Verhoeven, 1994). Initial evidence for differences in interdependence between different types of language skills and levels of resemblance between languages has been found in previous research (Proctor et al., 2010), but studies looking into the role of contextual factors in linguistic interdependence are lacking. On the level of the individual child, the child's language use indicates language exposure in which more profound language processing is involved than in exposure by hearing only (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010). On the family level, socioeconomic status (SES) is an important contextual factor in language development. Relative child language use—the child's use of one language relative to the other—and SES are both related to circumstances in which children can develop their language proficiency (Hoff, 2003; Pearson, 2007). In this study we test the hypothesis of *context-dependent linguistic interdependence* by examining these two contextual factors as moderators in the relation between L1 vocabulary and growth in L2 vocabulary, in a sample of five- and six-year old bilingual children with a Turkish background in the Netherlands.

Evidence for linguistic interdependence or cross-linguistic transfer has been found for various types of language skills, such as general language proficiency, vocabulary, narrative skills, and reading (Genesee & Geva, 2006; Ordóñez, Carlo, Snow, & McLaughlin, 2002; Proctor, August, Carlo, & Snow, 2006; Ramirez, 1987; Uccelli & Páez, 2007). The idea of linguistic interdependence has also been confirmed by neuroimaging studies, in which the same neural structures (particularly the left inferior frontal gyrus and superior temporal gyrus) were found to be responsible for both L1 and L2 processing (Abutalebi, 2008; Buchweitz & Prat, 2013). However, over the years some suggestions for revision or specification of the interdependence hypothesis have been proposed.

For instance, it has been suggested that the type of language skills needs to be taken into account, because the degree of interdependence differs for different types of language skills (Verhoeven, 1994). More recently, an interdependence continuum was proposed (Proctor et al., 2010). On this continuum, the interdependence between languages is hypothesized to be stronger for language skills that involve a small learning challenge, such as word-level skills, and weaker for language skills that require a broader range of knowledge, such as oral language, and stronger for languages that are more alike than for languages with a smaller resemblance. One of the shortcomings of Cummins' (1979) hypothesis is that it neglects the role of contextual factors (Verhoeven, 1994). In line with findings that experiences supporting vocabulary development are not equally available at all levels of child language use or in all SES groups (Hoff, 2003; Pearson, 2007), it is possible that linguistic interdependence varies for different levels of these contextual variables. Therefore, we hypothesize *context-dependent linguistic interdependence*, in which the extent of linguistic transfer varies depending on relative child language use and family SES. We suggest that a child is more likely to draw on its L1 skills in L2 development when SES-based or language usage-based sources of language experience or stimulation are lacking.

Regarding the potential moderating role of children's relative language use, previous studies have often emphasized the role of language exposure in explaining children's language development, but the actual language use is at least as important (Hammer et al., 2012). For bilingual children, the use of a certain language, L1 or L2, is positively related to their proficiency in that language (Bohman et al., 2010; Hammer et al., 2012). However, when looking at the profile of home language use, children who use both languages at home are more at risk for low proficiency than children who use only one language at home (L. Q. Dixon, Wu, & Daraghme, 2012). The relation between language use and language skills is bidirectional, with a better proficiency enabling people to use the language more, and more usage providing opportunities to improve proficiency (Pearson, 2007; Van Tubergen & Kalmijn, 2009). In addition, children invite certain language input via their language use, not only in terms of which language others use when talking to them, but also in terms of which words others use (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Pearson, 2007). It is suggested that bilingual children process a language differently when they use it themselves as compared to when they are exposed to others who use the



language to them (Bohman et al., 2010). Thus, given the intricate role of language use in the development of language proficiency, the extent of language usage as a resource to build L2 development upon might vary depending on children's language use patterns. If L2 usage-based resources are lacking, children might be more likely to use their L1 skills as a resource.

Another important contextual factor and possible moderator in the relation between L1 vocabulary and L2 vocabulary development is SES. A positive relation between SES and early vocabulary development has been shown for monolinguals (Hoff, 2003). Also, in several studies with bilingual samples, SES was positively related to L2 skills, but SES was not or negatively related to L1 skills (Hammer et al., 2012; Phinney, Romero, Nava, & Huang, 2001). Several studies have suggested that SES exerts its influence on language skills via maternal speech (Hoff, 2003; Huttenlocher et al., 2010), and stimulation in the home environment (Hindman & Morrison, 2012; Kalia & Reese, 2009; Prevo et al., 2014). In high-SES families L1 is generally used less and L2 is used more (Arriagada, 2005; Pearson, 2007; Van Tubergen & Kalmijn, 2009). However, the effect of SES on use of L1 relative to L2 is less strong than its effect on L2 proficiency, because language learning might be easier and economic incentives of L2 proficiency higher for people with a higher SES (Van Tubergen & Kalmijn, 2009). Based on the difference in relations of SES with L1 versus L2 proficiency, L1 proficiency might play a different role in L2 development for different SES groups. For example, a child growing up in a high-SES family with a very stimulating home environment will experience enough resources at home to develop L2 proficiency and might thus be less likely to also use its L1 skills as a base for L2 development than a child from a low-SES family in which these resources are lacking.

In sum, relative child language use and SES are interrelated and both are related to bilingual children's language skills, and interdependence between L1 and L2 might thus vary depending on child language use and SES, suggesting *context-dependent linguistic interdependence*. In this study we examine whether relative child language use and SES play a moderating role in the relation between L1 vocabulary and L2 vocabulary growth (linguistic interdependence) in a sample of five- and six-year old bilingual children with a Turkish background in the Netherlands. We hypothesize that: 1) the relation between L1 vocabulary and L2 vocabulary growth will be stronger for children who use their L1 more and

their L2 less; 2) the relation between L1 vocabulary and L2 vocabulary growth will be stronger for children from lower-SES families; 3) the relation between L1 vocabulary and L2 vocabulary growth will be stronger for children from lower-SES families who use their L1 more and their L2 less. The testing of this specification of the *linguistic interdependence hypothesis* (Cummins, 1979) will add to the ongoing discussion on circumstances under which the hypothesis is or is not valid. Furthermore, the results can provide important information for policies and education aiming at the support of bilingual language development. Depending on the strength and direction of linguistic interdependence at different levels of child language use and SES, advice on a possible differential focus of this language support can be made.

## METHOD

### Participants and procedure

Data for the current study were collected from 104 ethnic Turkish mothers in the Netherlands with their five- or six-year-old children, who were visited at home before, during and after the transition to formal reading education. These mothers were recruited from the municipal registers of several cities and towns in the western and middle region of the Netherlands. We selected second-generation Turkish immigrant mothers who were born in the Netherlands (with at least one of their parents born in Turkey), or first-generation Turkish immigrant mothers who moved to the Netherlands before the age of 11, and who had children who were in the 2<sup>nd</sup> year of Dutch primary school—which corresponds to the kindergarten year in the U.S.—at the time of the home visit (age 5.40 – 6.69 years). Families were only selected if the child's father was a first- or second-generation Turkish immigrant.

In total, 639 families were reached of whom 113 (18%) agreed to participate. Two respondents had to be excluded from this study because Kurdish was spoken at home, and seven others because the mothers did not provide questionnaire data at any of the home visits. A subgroup of mothers who did not want to participate ( $N = 152$ ) provided some general information about their families by filling out a form. These families did not differ significantly from the participating families in age of father ( $p = .36$ ), mother ( $p = .09$ ), and child ( $p = .26$ ), child's gender ( $p = .08$ ), total number of children in the family ( $p = .90$ ),

birth rank of the participating child ( $p = .20$ ), maternal education level ( $p = .19$ ), country of birth of mother ( $p = .60$ ) and father ( $p = .60$ ), mother's marital status ( $p = .41$ ), and child's family status ( $p = .69$ ).

In three consecutive years the participating parents completed questionnaires and each year mother and child participated in yearly two-hour home visits including an interview with the mother, computer tests for the child, and video observation. The children had a mean age of 6.08 years ( $SD = 0.30$ ) at the time of the first home visit. Thirty-nine percent of the sample consisted of boys. The mothers had a mean age of 33.17 years ( $SD = 4.15$ ). Thirty-one percent of the mothers and 88% of the fathers were born in Turkey. The mothers who were born in Turkey migrated to the Netherlands at a mean age of 5.82 years ( $SD = 3.83$ ), whereas fathers who were born in Turkey migrated to the Netherlands at a mean age of 20.04 years ( $SD = 8.64$ ). Most children lived in two-parent families with both biological parents (92%). The majority of the children had one sibling (58%), 10% had no siblings, and 32% had two or more siblings. Fifty-five percent of the children were the first-born child in their family. On average parents had completed intermediate vocational education, and the average gross annual family income was between €20,000 and €40,000.

Almost half of the mothers (49%) reported speaking an equal amount of Dutch and Turkish with their child, 41% mostly or only Dutch, and 10% reported speaking mostly or only Turkish with their child. Of the 65 fathers who filled out the father questionnaire, 35% reported speaking an equal amount of Dutch and Turkish with their child, 19% mostly Dutch, and 46% reported speaking mostly or only Turkish to their child. In the families where both fathers and mothers filled out the questionnaires, fathers reported speaking significantly more Turkish to their child than mothers did ( $t(63) = 6.95, p < .001$ ). Most mothers reported that they could speak and read Dutch (88% speaking; 94% reading) and Turkish (75% speaking; 77% reading) very well. Most fathers who filled out the father questionnaire also reported that they could speak (86%) and read (83%) Turkish very well. Almost half of the fathers reported that they could speak (42%) and read (49%) Dutch very well.

## Measures

Questionnaires were available in the Dutch and the Turkish language. All questionnaires in this study were translated from English into Dutch and Turkish

and back-translated in order to ensure correct wording in both languages. Most mothers (91%) chose to complete the Dutch version of the questionnaire. This may be explained by the fact that all second-generation Turkish mothers have attended school in the Netherlands, and are thus more used to written communication in Dutch, even though they may prefer Turkish for spoken communication (Yaman, Mesman, Van IJzendoorn, & Bakermans-Kranenburg, 2010b).

### ***Relative child language use***

Mothers reported on a 5-point scale (1 = only Turkish; 2 = more Turkish than Dutch; 3 = equal amount of Dutch and Turkish; 4 = more Dutch than Turkish; 5 = only Dutch) how often their child used the host relative to the ethnic language when speaking with them, with father, with siblings, and with Turkish friends. Relative child language use was computed as the mean score of these four items.

### ***Socioeconomic status (SES)***

Family SES was based on the family's annual gross income and the highest completed educational level of both parents at the first assessment. The annual gross income was measured on a 7-point scale (1 = no income; 2 = less than €10,000; 3 = €10,000-20,000; 4 = €20,000-30,000; 5 = €30,000-40,000; 6 = €40,000-50,000; 7 = more than €50,000). Parents' highest completed education was also measured on a 7-point scale (1 = no qualification; 2 = primary education; 3 = lower vocational education; 4 = intermediate vocational education; 5 = secondary education; 6 = higher vocational education; 7 = university level degree). Because factor analysis showed that maternal and paternal educational levels and annual family gross income loaded on a single factor (loadings of .87, .79, and .85 respectively), SES was computed as the mean of the standardized values of the income and education variables. If one of the SES variables was missing, the values of the missing variables were computed based on a regression equation that included the available values as predictors of the missing value, before computing the SES variable. For three families father's education was missing, and for 22 families annual income was missing while education levels were available, in most cases because mothers found their family income too confidential to report.

***Dutch vocabulary***

To measure Dutch expressive vocabulary, the Expressive One Word Picture Vocabulary Test (EOWPVT; Brownell, 2000) was translated into Dutch. In this test, a picture is shown and after a prompting question from the researcher the child has to name the picture in one word. All test administrations were audio-recorded to be able to decide on the scoring afterwards in case of ambiguous answers. Based on pilot assessments of the Dutch translation of this test, the decision was made to replace the map of the United States with a map of the Netherlands and to delete items 118 (*reel*), 146 (*prescription*) and 160 (*monocular*) for which no appropriate Dutch translation was available. Item-response analyses showed that this Dutch version of the test captured basically the same increase in difficulty level that is present in the original English version. The split-half (odd/even) sample reliability was  $> .99$ . The growth in Dutch vocabulary was computed by subtracting the Time 1 score from the Time 3 score.

***Turkish vocabulary***

Because bilingual children have been shown to have difficulties accessing their productive vocabulary in their ethnic language in the circumstance of immersion in the host language (Gibson, Oller, Jarmulowicz, & Ethington, 2012), a receptive vocabulary measure was most appropriate for the Turkish language. To measure Turkish receptive vocabulary, the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 2007) was translated into Turkish (Glück, 2009). In this test, four pictures are shown and the child is asked to select the picture that matches a spoken word. Because not all research assistants administering the child tests spoke the Turkish language, the Turkish pronunciation was recorded beforehand and children heard the Turkish word as soon as the four pictures that they could choose from were shown on the computer screen. If necessary, the child could ask the assistant to play the recorded word one more time. Item-response analyses showed that despite some variance in difference levels within sets, the increasing difficulty level from one set to the other that is present in the original English version was captured in this translation. The split-half (odd/even) sample reliability was  $.98$ .

Table 1. Descriptives and correlations of family SES, relative child language use and Dutch and Turkish vocabulary

	Range	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.
1. Relative child language use	1.00- 5.00	3.35 (0.74)	-							
2. Family SES	-2.09- 1.76	0.02 (0.83)	.36**	-						
3. Turkish vocabulary T1	11.00- 125.00	55.83 (25.63)	-.42**	.03	-					
4. Turkish vocabulary T2	15.00- 162.00	72.14 (33.62)	-.31**	-.01	.72**	-				
5. Turkish vocabulary T3	20.00- 173.00	82.29 (35.48)	-.43**	.00	.64**	.79**	-			
6. Dutch vocabulary T1	21.00- 81.00	45.28 (11.89)	.41**	.36**	-.14	-.01	-.11	-		
7. Dutch vocabulary T2	30.00- 92.00	57.28 (12.21)	.33**	.41**	-.07	.04	-.04	.74**	-	
8. Dutch vocabulary T3	40.00- 100.00	65.44 (12.68)	.33**	.46**	-.04	.05	-.05	.74**	.89**	-
9. Growth Dutch voc. T1-T3	-4.00- 45.00	20.16 (8.84)	-.08	.17	.13	.07	.08	-.28**	.28**	.44**

Note. Child language use ranges from 1 = only Turkish, to 5 = only Dutch.

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

## Analyses

For all respondents included in this study we had data on the relevant variables from at least one time of assessment. Missing values for a particular variable were estimated based on a regression equation that included the available values of this variable at other assessment time points as predictors of the missing value. One outlier on Time 1 Turkish vocabulary was winsorized to be equal to the next highest value of the particular variable (W. J. Dixon, 1960).

Correlations were computed to explore the relations between SES, relative child language use, children's Turkish and Dutch vocabulary scores at each assessment time point, and children's growth in Dutch vocabulary across assessments. The potential moderator effects of the contextual variables in the cross-language relation between Turkish vocabulary and Dutch vocabulary growth were tested by means of regression analysis. Before computing interaction variables, the two potential moderator variables and the predictor variable Turkish vocabulary were centered by subtracting the mean from each participant's score. Interaction variables were based on multiplication of the centered potential moderator variable(s) with the centered Turkish vocabulary score. In this regression analysis Dutch vocabulary growth from Time 1 to Time 3 was the outcome variable to be predicted. Age, and Dutch vocabulary at Time 1 were entered into the regression in the first step, then relative child language use, SES, and Turkish vocabulary (all Time 1) were entered. The two-way interaction terms were entered in the third step and the three-way interaction in the last step.

## RESULTS

Descriptive statistics of the main variables after winsorizing and imputation of missing values are reported in Table 1. Given that the mean for language use is above the scale midpoint, children on average used more Dutch than Turkish when speaking with others. The correlations between all contextual variables of interest at Time 1 and Dutch and Turkish vocabulary scores at the three assessments are shown in Table 1. Relative child language use showed strong correlations with Dutch and Turkish vocabulary scores at all assessment time points in that a child's vocabulary score in a certain language was generally higher if that language was used more. Children from families with a high SES generally use more Dutch than Turkish, and have higher Dutch vocabulary scores. Family

SES was not related to the children's Turkish vocabulary scores or to Dutch vocabulary growth. Vocabulary scores showed strong stability over time, which makes difference scores more reliable (D. R. Thomas & Zumbo, 2012). The correlations did not show evidence for linguistic interdependence, because no significant correlations between Dutch and Turkish vocabulary scores were found. The negative correlation between Time 1 Dutch vocabulary and vocabulary growth indicates that there is less growth in vocabulary for children who start off with a higher Dutch vocabulary score.

To examine potential moderator effects of relative child language use and SES in L1-L2 linguistic transfer across time, a regression analysis was conducted. The results of this regression analysis are presented in Table 2. Child language use was a significant moderator in the relation between Time 1 Turkish vocabulary and Dutch vocabulary growth, and is illustrated in Figure 1. Positive transfer from

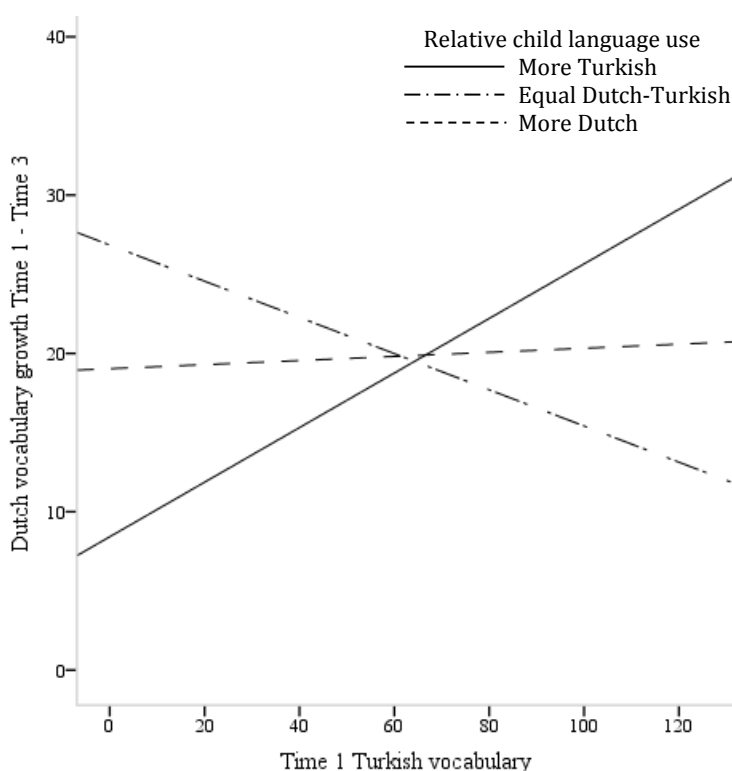


Figure 1. Moderation of relative child language use in the relation between Turkish vocabulary and Dutch vocabulary growth



Turkish to Dutch vocabulary was only present in the group of children who spoke more Turkish than Dutch ( $R^2 = .34, p = .002$ ), but not in the group of children who spoke more Dutch than Turkish ( $R^2 < .01, p = .96$ ). For the children who speak an equal amount of Dutch and Turkish, there was a trend towards negative transfer of Turkish vocabulary on Dutch vocabulary growth ( $R^2 = .08, p = .09$ ). SES was found to be a significant predictor of Dutch vocabulary growth, but no significant interaction effect of SES and Time 1 Turkish vocabulary was found.

The differences between the child language use groups in Time 1 vocabulary scores were tested in one-way analyses of variance (ANOVAs). These ANOVAs showed that children who spoke more Dutch than Turkish had significantly lower Time 1 Turkish vocabulary scores,  $F(2, 101) = 8.19, p = .001$ , and higher Time 1 Dutch vocabulary scores,  $F(2, 101) = 9.71, p < .001$ , than children who spoke more Turkish, while the mean vocabulary scores of children who spoke an equal amount of Dutch and Turkish were in between the scores of the other two groups and did not significantly differ from them. However, children in the different groups of language use did not differ significantly in their Dutch vocabulary growth,  $F(2, 101) = 0.12, p = .89$ , as is illustrated in Figure 2.

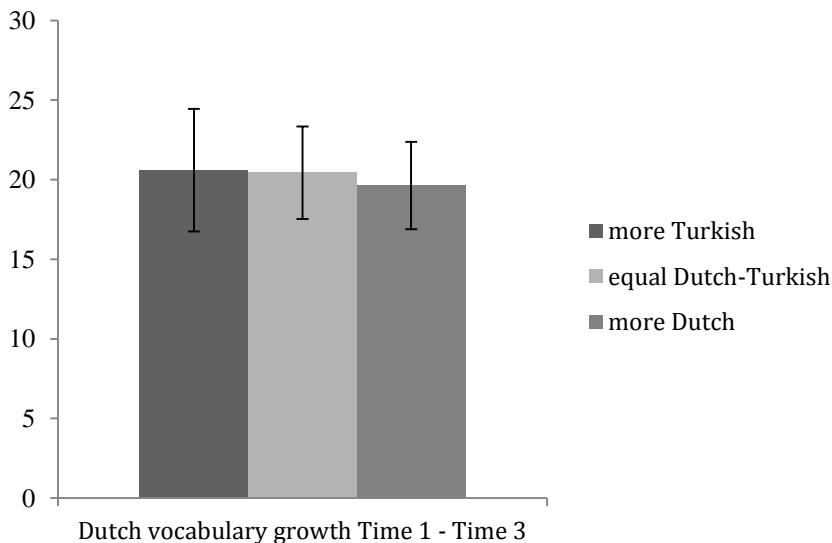


Figure 2. Dutch vocabulary growth in different groups of relative child language use

Table 2. *Regression analysis of moderator effects of contextual variables in the relation between Time 1 Turkish vocabulary and Dutch vocabulary growth*

	$\Delta R^2$	$\beta$	$p$
Step 1	.12 **		
Age		-.21	.04
Time 1 Dutch		-.20	.05
Step 2	.07 *		
Relative child language use		-.01	.90
SES		.28	.01
Time 1 Turkish		.08	.47
Step 3	.06 *		
T1 Turkish-by-Child language use		-.25	.01
T1 Turkish-by-SES		.17	.08
Step 4	.00		
Three-way interaction		-.08	.52
Total $R^2$	.25 **		

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

## DISCUSSION

In a sample of five- and six-year old bilingual children with a Turkish background in the Netherlands, we found that relative child language use moderated the relation between Turkish vocabulary and Dutch vocabulary growth. Positive transfer from L1 to L2 was only present in the group of children who spoke more Turkish than Dutch with their parents, siblings and Turkish friends. SES was not a moderator of linguistic interdependence, but it was a significant predictor of Dutch vocabulary growth. The increase in vocabulary scores over time was larger for children from families with a higher SES. The findings provide support for context-dependent linguistic interdependence.

Relative child language use moderated the relation between Turkish vocabulary and Dutch vocabulary growth. In line with our hypothesis, children who use more Turkish deploy their Turkish vocabulary skills in the development of their Dutch vocabulary. This might be explained by the more profound processing of a language when actively using it as compared to only being exposed to it receptively (Bohman et al., 2010). Given the previous research finding that transfer effects are generally stronger for higher levels of L1 proficiency (Ordóñez et al., 2002), and the findings from neuroimaging studies

that the similarity in brain activation between L1 and L2 is higher for more proficient bilinguals (Buchweitz & Prat, 2013), a possible role of proficiency in the moderator effect of language use should be taken into account. Although we did find differences in vocabulary scores between children who use Dutch more and children who use Turkish more, the vocabulary scores of the children who used both language equally did not differ significantly from the scores of the other two groups. This means that the moderator effect that we found cannot be explained by proficiency differences, and reflects some added advantage of frequency of L2 use above and beyond proficiency in facilitating L1-L2 transfer. Furthermore, the language use groups did not differ in their scores on the outcome variable Dutch vocabulary growth. The three-way-interaction of Turkish vocabulary, child language use, and SES was not significant. This implies that the moderating effect of child language use is present for children across all SES levels.

The family-level contextual factor SES was a significant predictor of Dutch vocabulary growth in the regression model, after controlling for age, Time 1 Dutch vocabulary score and relative child language use, but SES did not moderate the relation between Time 1 Turkish vocabulary and Dutch vocabulary growth. Our second hypothesis was not supported. Apparently, linguistic interdependence effects from L1 vocabulary to L2 vocabulary development are similar across SES groups. Correlational analyses showed that SES was not related to L1 vocabulary scores, which is in line with previous research (Quiroz, Snow, & Zhao, 2010). A possible explanation for this absence of a relation between SES and L1 vocabulary is that high-SES parents stimulate their children's L1 development because they value bilingualism more, while low-SES parents use L1 more because that is the language they feel most comfortable with (Arriagada, 2005), thereby possibly stimulating their children's L1 use as well. This might also explain why we did not find a moderating effect of SES in the relation between Turkish vocabulary and Dutch vocabulary growth. The Turkish language is equally important across SES-groups, albeit for different reasons, and Turkish language skills are thus equally available as a possible resource for Dutch vocabulary development.

For children who use both languages equally, a trend towards competition between the languages was found. In previous research lower proficiency scores were found for children who spoke both languages at home compared to children who spoke only L1 or only L2 at home (L. Q. Dixon et al., 2012). Also, it has been

suggested that competition between the languages could lead to *semilingualism* – limited skills in both languages (Cummins, 1979). However, the average vocabulary scores of the children who use both languages equally did not differ from the scores of children who spoke only Dutch or only Turkish, so in our study the equal-use group is not the group that is worst of in terms of language proficiency. It could be that the equal use of two languages involves language mixing, and that more mixing takes place when a child is more proficient in L1. More language mixing is related to lower vocabulary scores (Byers-Heinlein, 2013), so the negative trend of Turkish vocabulary on Dutch vocabulary growth in the equal-use group might be mediated by language mixing. The equal-use group was a heterogeneous group, consisting of children who spoke a mix of Dutch and Turkish with their parents, siblings and Turkish friends and children who spoke mostly Dutch with some people and mostly Turkish with others. Differences in linguistic interdependence between these subgroups could not be tested in this study, because group sizes were too small. Future research could look into the differences in linguistic interdependence between these two subgroups of equal language use.

The current study has some limitations. First, the response rate was low, despite all the effort that was put into the recruitment of families for this study. Letters and brochures were sent in both Dutch and Turkish and contained culturally adapted pictures. Furthermore, we tried to personally contact the families. These are all important aspects in the recruitment of ethnic minority respondents (Yancey, Ortega, & Kumanyika, 2006). It should be noted that, paradoxically, more effort to reach possible participants could lead to a lower response rate. The response rate is negatively affected when eligible participants who are difficult to reach refuse participation, whereas these potential participants would have remained unreached with less recruitment effort. Second, child language use was assessed with a scale on which the use of one language relative to the other language was reported by mother. This measure does not provide information on the absolute amount of language use in each of the languages. However, relations between language use and language proficiency have been found in studies that used the same kind of measure as well as studies that used a more detailed measure of language use (Bohman et al., 2010; Hammer et al., 2012). Third, vocabulary was the only measure of language proficiency in this study and it was measured receptively in Turkish and expressively in Dutch.

Results might have been different if the same language modality had been used for both languages. However, a receptive measure is a better indicator of the children's L1 vocabulary, because the receptive-expressive gap that is often present in bilingual children's vocabulary has been shown to be larger for the ethnic language (Gibson et al., 2012), and because children may suffer from word retrieval problems in L1 (Hakuta & D'Andrea, 1992).

The trend towards competition between the languages for children who use both languages equally, and the role that language mixing plays in this relation, should be investigated further in future research. Also, future research could test context-dependent linguistic interdependence with samples of other ages and other immigrant generations. The children in this study were in the transition to formal education in Dutch and had quite some environmental exposure to L2 at the time of the study. According to the Revised Hierarchical Model (RHM) (Kroll & Stewart, 1994), at higher levels of L2 proficiency the cognitive link to the concept of a word becomes more important and the link to the translation of the word in L1 becomes less important. The distribution of the child language-use groups might also be different at younger ages, because the language use changes when children start preschool or childcare (Prevo, Mesman, Van IJzendoorn, & Pieper, 2011). The mothers of the children in this study were second-generation immigrants or first-generation immigrants who moved to the Netherlands as children. Children of these mothers can be expected to be less proficient in their L1 than children with two first-generation parents (Hakuta & D'Andrea, 1992). Context-dependent linguistic interdependence might also be different for children from different immigrant generations. Furthermore, previous research has shown that cross-language effects are less strong when the skills that are being studied involve a smaller learning challenge and when the two languages show fewer resemblance (Genesee & Geva, 2006; Proctor et al., 2010), and our hypothesis should thus also be tested with skills other than vocabulary (e.g., syntactic skills) and in samples who speak two languages that are more similar than Turkish and Dutch (e.g., Spanish and English).

Our findings confirm the existence of context-dependent linguistic interdependence, which is moderated by relative child language use. There is positive transfer of L1 vocabulary to L2 vocabulary growth for children who use L1 more, but not for children who use L2 more. Also, SES predicts L2 vocabulary growth, but linguistic interdependence does not vary for different SES levels.

Interventions or education programs focusing on support of the L1 can have a positive effect on L2 development for children who use L1 more, without doing any harm to the L2 development of the children who use L2 more. For this last group of children, the more frequent use of L2 can be an important resource for L2 development, whereas for the others L1 proficiency is a more important resource. For children who use both languages equally, more research is needed into the role of language mixing in linguistic interdependence. Our findings show that the *linguistic interdependence hypothesis* (Cummins, 1979) is context-dependent and only valid under circumstances of more L1 use relative to L2.



# Chapter

# 6

## **General discussion**





## GENERAL DISCUSSION

The findings reported in this dissertation provide evidence for the importance of immigrant-background bilingual children's language skills for their school outcomes, and shed light on the intricate role that contextual factors play in the development of these important language skills. Chapter 2 showed that there were robust moderate to strong within-language relations between oral language proficiency and the school outcomes of early literacy, reading, spelling, mathematics and academic achievement, and cross-language relations for early literacy and reading. The study with Turkish-background toddlers in the Netherlands presented in Chapter 3 showed that the increase in maternal use of Dutch with the child between ages 2 and 3 was stronger for mothers of children who started using a child care facility in the previous year and for mothers from families living in a neighborhood with a low percentage of non-Western immigrants. In Chapter 4, the results showed that reading input mediated the relation between SES and host language vocabulary and between maternal language use and host language vocabulary, whereas only maternal language use was related to ethnic language vocabulary. Chapter 5 provided support for the hypothesis of context-dependent linguistic interdependence, and showed that positive transfer from L1 vocabulary to L2 vocabulary growth was only present for children who used L1 more than L2 when talking to others. The findings of these four chapters are integrated below. Furthermore, theoretical and practical implications, the limitations of the studies, and directions for future research are provided.

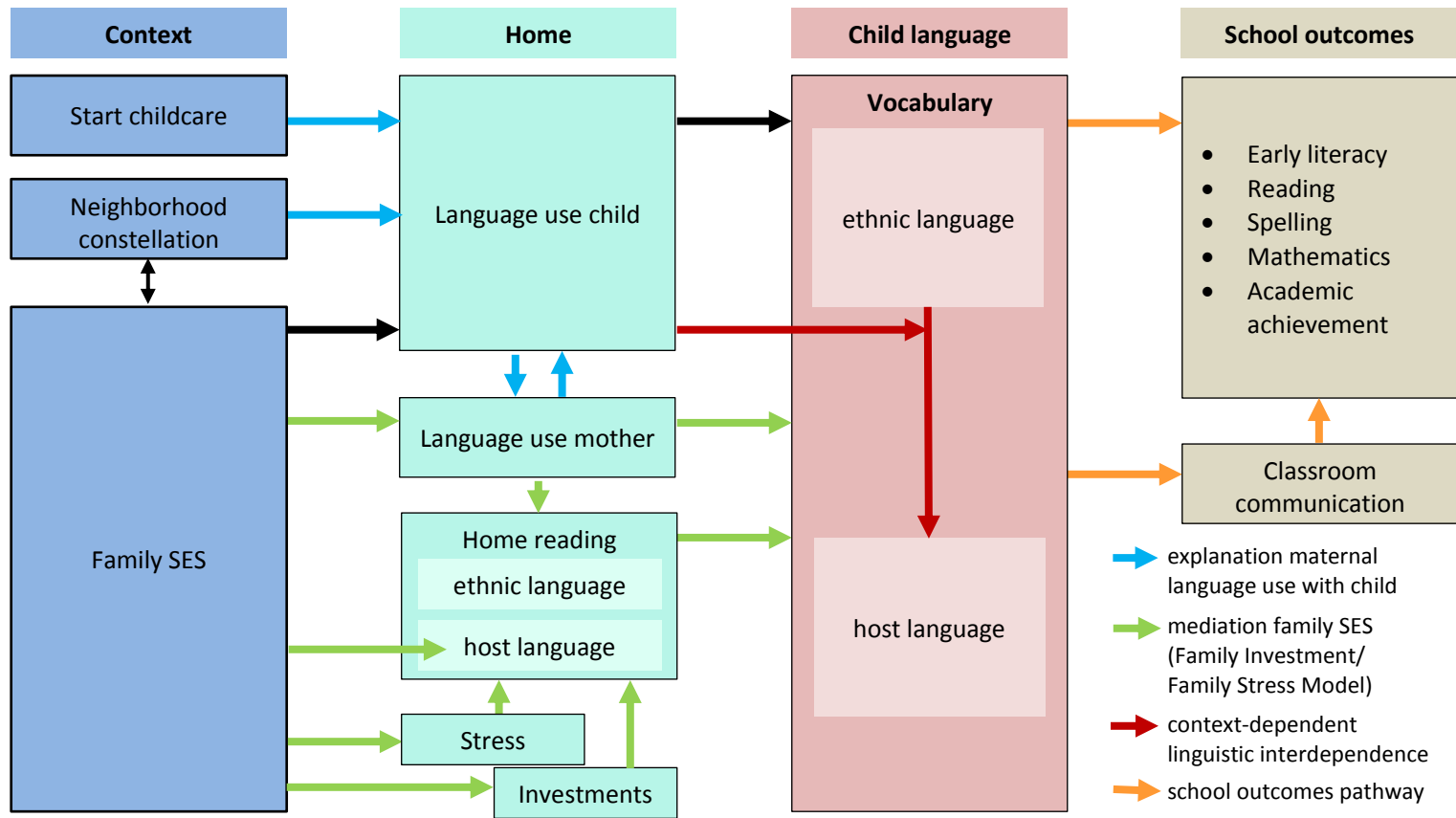
### **Theoretical implications**

The results of the studies presented in this dissertation and findings from previous research can be integrated into the model presented in Figure 1. The model shows interrelations that were confirmed by our studies as well as potential mechanisms to explain certain interrelations derived from previous research findings. Consistent with the bioecological model of development (Bronfenbrenner & Morris, 2007), our integrated model includes proximal processes and characteristics of the proximal and more distal environment in which children's language development progresses.

First of all, the model shows the importance of bilingual children's language competence as represented by the relation between children's vocabulary and their school outcomes (the orange arrow). The results of our meta-analyses (Chapter 2) showed that within-language relations between the oral language proficiency of bilingual children with an immigrant background and their school outcomes were substantial and significant. Part of the influence of oral language proficiency on school outcomes, particularly proficiency in the language of education, is likely to be mediated by the ability to communicate with the teacher and to understand explanations and instructions in class (Hoff, 2013). This explanatory mechanism is included in the school outcomes pathway (orange arrows) in the model.

Language input in the home environment (turquoise boxes) plays a central role in our integrated model. According to the constructivist view, language input is critical to children's language outcomes (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010). Children infer language rules from the language input to which they are exposed (Ellis, 2002). Because in most families mothers are the primary caregivers and generally provide more language input to children than fathers do (Pancsofar & Vernon-Feagans, 2006), maternal language use forms an important language input source for children. Reading input is a specific form of language input, which can be used by parents as a means to stimulate children's language development. Reading provides children experiences to learn words from text and pictures (Collins, 2010). The families in our sample provided less reading input in the ethnic than in the host language (Chapter 4), which might be the result of an ongoing increase in use of the host language as was found for mothers of toddlers (Chapter 3). The more limited amount of reading input in the ethnic language might not be sufficient to affect children's vocabulary in that language, contrary to the more frequent reading in the host language which affected host language vocabulary (Chapter 4).

The notion of context-dependent linguistic interdependence is represented by the red arrows in the model. We found that child language use moderated the relation between Turkish vocabulary and Dutch vocabulary growth (Chapter 5). Linguistic interdependence (Cummins, 1979) was only present for children who used the ethnic language more than the host language for speaking to others. We assume that the use of ethnic language knowledge as a base for host language development depends on the availability of other sources



*Note.* The model is based on associations found in our studies and potential explanatory mechanisms derived from the literature

*Figure 1.* Integrated model of research findings and potential explanatory mechanisms regarding bilingual language

for language development, such as frequent L2 use. If a child knows a word in the ethnic language, the concept that the word refers to will also be available in the child's conceptual memory (Kroll & Stewart, 1994), and that conceptual representation can form a base to further develop host language vocabulary. This ethnic language base is likely to be stronger when the ethnic language is used more, as producing output in a language requires more profound processing of the language than only listening to input in that language (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010). Also, children might be more inclined to use ethnic language knowledge for their host language development if they lack sufficient experience with using the host language.

Family SES is an environmental variable that exerts its influence mainly via elements of the home environment, as reflected by the green mediation pathways in our model. Our study showed that SES was an important factor that explained differences in maternal language use and home reading input in the host language (Chapter 4). Parents with a higher SES generally used the host language more, which also led them to read more in the host language. Maternal language use was in turn related to children's vocabulary in both languages, and host language reading input in the home was related to host language vocabulary. In an immigrant-background sample, SES is not only an indicator of a family's socioeconomic situation but might also be an indicator of acculturation to the host culture (Bohman et al., 2010). Increased host language use is part of this acculturation, which can be a result of as well as a reason for their higher education and income. Also, in line with the Family Investment Model and the Family Stress Model, families with a higher SES can invest more financial and educational capital in language stimulation and reading and they experience fewer stressors that interfere with undertaking language and literacy activities with their children (Conger & Donnellan, 2007).

Finally, the model shows childcare and the ethnic constellation of the neighborhood as environmental variables that might affect child language use, represented by the blue pathways. The exposure to the host language in child care has a positive effect on children's host language proficiency (Silvén & Rubinov, 2010; Uchikoshi, 2006), whereas the pressure to use the host language to adapt to the host culture is less strong in neighborhoods with relatively more immigrants (Van Tubergen & Kalmijn, 2009). This percentage of immigrants is likely to be higher in low-SES neighborhoods (Termorshuizen, Smeets, Braam, & Veling,

2014). We hypothesize that changes in mothers' host language use (Chapter 3) are partly fuelled by children's increasing use of and proficiency in the host language (Fillmore, 2000; Pearson, 2007). The environmental effects of the neighborhood and childcare facilities can lead to increased host language proficiency and use by the child, which in turn invites the mother to use the host language more when speaking to the child, which is again beneficial for host language proficiency and use of the child (Pearson, 2007). Thus, as the blue arrows in the model suggest, the relation between child and mother language use is thought to be reciprocal.

### **Limitations and implications for future research**

The findings of the studies in this dissertation provide directions for future research. Our study samples were relatively small, and our data cross-sectional for some of our analyses. The integrated model in Figure 1 should be tested longitudinally in a large bilingual sample to examine its validity. Especially the concepts and pathways that are hypothesized in the model but not tested in the studies in this dissertation, such as interrelations between language use of children and mothers, deserve further investigation. In addition, the potential mediational role of child language use in the relation of start of childcare and ethnic constellation of the neighborhood with maternal language use should be studied further. Also, to test the validity of the Family Stress and Family Investment Model (Conger & Donellan, 2007) in the context of bilingual language development, it would be helpful if future studies measure families' educational and financial investments and stress levels and examine their relation to home reading input and children's vocabulary outcomes. Classroom communication also deserves further research attention to confirm its hypothesized mediational role in the relation between oral language proficiency and school outcomes.

Except for the meta-analyses, all studies in this dissertation focus on Turkish immigrant-background children in the Netherlands in early childhood with mainly second-generation mothers. However, our findings cannot be generalized to other immigrant-background samples without caution. First, immigrant policies, status of the ethnic language, distance between the ethnic and the host language, and the availability of written materials in the ethnic language can vary between host countries and ethnic groups. Also, the importance of certain environmental factors can decrease or increase with increasing age, and the ethnic language is more prominent in earlier immigrant generations

(Hakuta & D'Andrea, 1992). Convergence of our findings with previous research findings in monolingual or bilingual samples provides some initial support for generalization of the relations and mechanisms to other immigrant-background samples. Nevertheless, the relations between environmental and language variables and differences in these relations between the ethnic and the host language that we found and the notion of context-dependent linguistic interdependence should also be studied in immigrant-background populations from different ethnic backgrounds, in different host countries, at older ages, and from earlier or later immigrant generations to confirm validity across immigrant-background samples.

In addition, there are some measures that could be added in future studies to obtain a more complete view of language environments and language outcomes. The Likert scales that we used in Chapters 3, 4 and 5 to measure which language mother speaks most to her child and which language the child speaks most to others, measure the relative quantity of language use and do not provide information about the absolute amount of language use. Future studies using separate measures in each language to measure language use frequency with scale points referring to absolute amounts of time, can test hypotheses about a critical mass of language input or the leveling off of the relation between input and proficiency and look into issues of language mixing (Byers-Heinlein, 2013; Pearson, 2007; Thordardottir, 2011).

Furthermore, future studies should also include questionnaires or observations measuring not only the quantity but also the quality of the language input, which was not captured by the questionnaires we used. The effect of maternal language input on children's language development will probably be stronger if the input is of good quality, as lexical richness and syntactic complexity of maternal language input and maternal use of referential are positively related to children's expressive vocabulary (Hoff, 2006; Hoff & Naigles, 2002; Tamis-LeMonda, Song, Leavell, Kahana-Kalman, & Yoshikawa, 2012), and word learning is prompted if the words that a child hears are accompanied by rich definitions (Collins, 2010). Finally, future studies should use normed tests for receptive and expressive vocabulary in the ethnic and the host language, so that children's scores can be interpreted relative to age norms for bilingual and monolingual children in each language.

**Implications for policy and practice**

In Chapter 3 we found an increase in mothers' use of the host language, relative to the ethnic language, with their children between ages 2 and 3. It is likely that this increase in use of the host language will continue after the preschool years (Mancilla-Martinez & Kieffer, 2010). Host language development is important in children's school careers, because most or all of their education takes place in the host language (Uccelli & Pérez, 2007). However, this language shift towards more use of the host language can jeopardize children's ethnic language development (Hammer, Davison, Lawrence, & Miccio, 2009), which can be important for children's ethnic identity and parent-child relationships (Oh & Fuligni, 2010; Phinney, Romero, Nava, & Huang, 2001), and under certain circumstances also for development of the host language. The family is an important resource for maintenance of the ethnic language. We found that if mothers used the ethnic language relatively more with their children, the children had a larger ethnic language vocabulary, and if they used the host language relatively more, the children had a larger host language vocabulary. If the increase in use of the host language indeed continues over the years, the need to speak the ethnic language within the family is lowered and children receive less input in that language to learn new words and language rules.

Such a language shift is seen in immigrant-background families worldwide (McCabe et al., 2013). Many immigrant language policies focus only on development of the host language. This also holds true for the Netherlands, where no more government support for ethnic language education is provided since 2004 and the use of a language other than Dutch at home is perceived as a barrier to successful school achievement (Extra & Yağmur, 2004, 2006; Verspoor & Cremer, 2008). However, our findings show that for certain subgroups ethnic language skills can have a positive effect on growth in host language skills. Previous studies have shown such positive cross-language transfer even for Turkish-Dutch children with specific language impairment (Verhoeven, Steenge, & Van Balkom, 2012). Besides the effects that the ethnic language can have on development of the host language, the ethnic language is also important for ethnic identity (Phinney et al., 2001), and parent-child relationships, because it is oftentimes the language in which the parents can most easily express themselves (Fillmore, 1991, 2000; Oh & Fuligni, 2010). Not speaking the same language can increase the emotional distance between parent and child (Tseng & Fuligni,

2000). The language in which parents are proficient, is also the language in which they can provide qualitatively better input to their children (McCabe et al., 2013). In addition, bilingualism brings along cognitive advantages in attentional control, working memory, metalinguistic awareness, and abstract and symbolic representation skills (Adesope, Lavin, Thompson, & Ungerleider, 2010).

The importance of bilingualism for ethnic identity and parent-child relations, and its cognitive advantages, combined with our findings that under certain circumstances ethnic language proficiency can have a positive effect on host language development, plead for a shift towards a situation in which not only the host language, but also the ethnic language is valued and parents are supported to use this language with their children. Both monolinguals and bilinguals need to be made aware of the benefits of bilingualism (Agirdag, 2010). In the specific case of Turkish-Dutch bilinguals in the Netherlands, it is encouraging for initiatives aimed at supporting the ethnic language in addition to the host language that the Turkish language has a high vitality, meaning that large proportions of Turkish-background people from later immigrant generations still know and use the language (Extra & Yağmur, 2006). This high vitality of the Turkish language in the Netherlands is also shown by the fact that the children in the Turkish-Dutch samples used in Chapter 3, 4, and 5 are still proficient in Turkish to some extent, although they are from later immigrant generations, and might thus be expected to have lost their ethnic language (Hakuta & D'Andrea, 1992).

Home-based interventions to directly and indirectly improve bilingual children's language proficiency, which will in turn benefit their school outcomes, can include home visits in which parents receive information about home language and literacy activities, and provision of literacy resources (Hirst, Hannon, & Nutbrown, 2010; Zhang, Pelletier, & Doyle, 2010). Home reading in the host as well as the ethnic language can have beneficial effects for host language development (Roberts, 2008). Video support as provided in digital picture storybooks can add to the learning from book reading for immigrant-background children (Verhallen & Bus, 2010). Educational TV programs can also have a positive effect on vocabulary (Uchikoshi, 2006). On the school level, book-rich classrooms have positive effects on children's language proficiency and home rereading of school books can improve parents' involvement in language learning and children's motivation for language learning (Koskinen et al., 2000). Schools



can also impact the home literacy environment by providing literacy resources or assigning home reading as homework (Reese, Thompson, & Goldenberg, 2008).

### **Conclusions**

Overall, the findings in this dissertation show that bilingualism is more than just the sum of two parts. Meta-analyses show that proficiency in the language of education has a positive effect on all school outcomes, and for early literacy and reading proficiency, cross-language effects were also found. Ethnic constellation of the neighborhood, start of child care, and family SES are related to home language and literacy input, which is in turn related to children's vocabulary outcomes. Under circumstances of more ethnic than host language use, children can experience positive effects of their ethnic language skills in the development of their host language skills. Although the optimal balance between the languages can vary depending on individual circumstances, the focus of interventions and policies should not be solely on the host language, but the ethnic language should receive the attention it deserves. Our findings show that bilingualism is a complex puzzle of input and output in two languages that can only be solved by taking children's (family) environment into account.





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# Appendices



## NEDERLANDSE SAMENVATTING

Over de hele wereld groeien veel kinderen met een migrantenachtergrond tweetalig op, omdat hun etnische of eerste taal verschilt van de meerderheidstaal, hun tweede taal. De etnische taal is belangrijk voor het vormen van een etnische identiteit en voor het communiceren met familieleden (Oh & Fuligni, 2010), terwijl de meerderheidstaal van belang is voor een succesvolle schoolcarrière, omdat dit de taal is waarin de meeste tweetalige kinderen met een migrantenachtergrond onderwijs volgen (Davison, Hammer, & Lawrence, 2011; Verhoeven, 2007). Hoewel tweetaligheid bepaalde cognitieve voordelen kan hebben (Adesope, Lavin, Thompson, & Ungerleider, 2010), presteren veel tweetalige kinderen met een migrantenachtergrond op school slechter dan hun eentalige leeftijdgenoten (e.g. Aud et al., 2012; Fleischman, Hopstock, Pelczar, & Shelley, 2010). Dit wordt mogelijk veroorzaakt doordat ze ten opzichte van hun eentalige leeftijdgenoten een achterstand in taalvaardigheden hebben in de taal waarin het onderwijs wordt gegeven.

De sociaaleconomische status (SES) van een gezin, de etnische samenstelling van de buurt en het gebruik van kinderopvang kunnen taalgebruik en -ontwikkeling direct en indirect beïnvloeden. Tweetalige kinderen met een migrantenachtergrond groeien gemiddeld vaker op in gezinnen met een lagere SES, waar de meerderheidstaal minder gebruikt wordt (L. Q. Dixon, Wu, & Daraghmeh, 2012) en geletterde activiteiten in huis minder gangbaar zijn (Hindman & Morrison, 2012). Daarnaast worden bepaalde taalstimulerende activiteiten die gangbaar zijn in West-Europese culturen mogelijk in mindere mate of op een andere manier toegepast in gezinnen met een migrantenachtergrond (Bus, Leseman, & Keultjes, 2000; Scheele, Leseman, & Mayo, 2010). Tweetalige kinderen wonen ook vaker in buurten met hogere percentages niet-westerse immigranten, waar de etnische taal meer wordt gebruikt (Arriagada, 2005). Als kinderen voor het eerst een kinderdagverblijf of peuterspeelzaal bezoeken, gaan ze de meerderheidstaal meer gebruiken (Leseman, 2000). Het patroon van taalgebruik in de thuissituatie kan daardoor ook beïnvloed worden.

De tegenstrijdige bevindingen omtrent de cognitieve voordelen van tweetaligheid en slechtere schoolprestaties van tweetalige kinderen met een migrantenachtergrond roepen vragen op over het belang van taalvaardigheid in

beide talen voor de schooluitkomsten van deze kinderen. Daarnaast roepen de eerdere bevindingen over verschillen in taalstimulering in gezinnen met een migrantenachtergrond en de effecten van factoren op gezins- en gemeenschapsniveau op taaluitkomsten vragen op over de samenhang tussen deze contextuele factoren, het taalgebruik binnen de gezinnen en de taalvaardigheid van kinderen. Inzicht in deze factoren en de samenhang ertussen kan belangrijke informatie opleveren over de mogelijke sleutelrol die stimulering van taalvaardigheid kan vervullen in het verkleinen van de achterstand in schoolprestaties van kinderen met een migrantenachtergrond en over hoe ondersteuning van de taalontwikkeling van deze kinderen vormgegeven kan worden en toegespitst kan worden op de specifieke behoeften van deze groep. In dit proefschrift staan daarom de volgende onderzoeksvragen centraal:

1. Hoe sterk zijn de relaties tussen mondelinge taalvaardigheid van tweetalige kinderen met een migrantenachtergrond in zowel de eerste als de tweede taal en de schooluitkomsten *beginnende geletterdheid, lezen, spelling, rekenen* en *schoolprestaties in het algemeen*?
2. In hoeverre is de hoeveelheid Nederlands of Turks die moeders gebruiken in de communicatie met hun peuters en de stabiliteit of verandering van dat taalgebruik in de loop van een jaar gerelateerd aan de etnische identiteit van moeder, de start van het gebruik van kinderopvang of de etnische samenstelling van de buurt?
3. In hoeverre wordt het verband tussen SES en woordenschat in zowel Nederlands als Turks gemedieerd door het taal- en leesaanbod in het gezin in elk van beide talen?
4. In hoeverre varieert de relatie tussen Turkse woordenschat en groei in Nederlandse woordenschat onder invloed van de contextuele factoren *taalgebruik met anderen* en *SES van het gezin*?

### **Tweetalige taalvaardigheid en schooluitkomsten**

De relaties tussen mondelinge taalvaardigheid van tweetalige kinderen met een migrantenachtergrond in zowel de eerste als de tweede taal en de schooluitkomsten *beginnende geletterdheid, lezen, spelling, rekenen, en schoolprestaties in het algemeen* werden onderzocht in een reeks van 16 meta-analyses. Voor alle schooluitkomsten gold dat een betere taalvaardigheid in

dezelfde taal als de schooluitkomst gerelateerd was aan betere schooluitkomsten. Beginnende geletterdheid en lezen waren ook gerelateerd aan taalvaardigheid in de andere taal. Voor alle schooluitkomsten gold dat de verbanden binnen dezelfde taal sterker waren dan de verbanden tussen taalvaardigheid en schooluitkomsten in verschillende talen.

De gevonden verbanden waren zeer robuust. Slechts zes van de 96 getoetste moderator-effecten waren significant. De relaties tussen taalvaardigheid in de eerste taal en beginnende geletterdheid in de eerste en de tweede taal waren sterker in onderzoeken waarin woordenschat als maat voor taalvaardigheid werd gebruikt dan in onderzoeken die een meer algemene taalvaardigheidsmaat gebruikten. Dit zou verklaard kunnen worden door het feit dat zowel woordenschat als beginnende geletterdheid op woordniveau worden gemeten, terwijl bij een meer algemene maat ook op zins- en tekstniveau wordt gemeten. De verbanden tussen taalvaardigheid en lezen waren sterker voor kinderen in hogere schoolklassen en in onderzoeken waarin leesbegrip als maat voor leesvaardigheid werd gebruikt. Dit sluit aan bij de Simple View of Reading (Hoover & Gough, 1990), waarin gesteld wordt dat het belang van taalvaardigheid voor lezen toeneemt in hogere klassen wanneer de nadruk binnen de leesinstructie verschuift van woordherkenning naar leesbegrip. Het verband tussen taalvaardigheid in de tweede taal en lezen in de tweede taal was sterker voor steekproeven waarvan de meerderheid deelnam aan taallessen in de eerste taal of aan een tweetalig lesprogramma. Dit kan mogelijk verklaard worden door de extra aandacht die in deze programma's besteed wordt aan taal in het algemeen (Cheung & Slavin, 2005).

### **Taalgebruik van moeders met een Turkse achtergrond met hun peuters**

De ontwikkeling van het taalgebruik van Turks-Nederlandse moeders met hun peuters en de factoren die hierop van invloed zijn werden onderzocht in een longitudinale studie met moeders van de tweede generatie. Deze moeders vulden vragenlijsten in toen de kinderen 2 jaar waren en nogmaals toen de kinderen 3 jaar waren. Moeders die zich meer verbonden voelden met de Turkse cultuur spraken meer Turks en minder Nederlands met hun peuters.

Het gebruik van de Nederlandse taal in de communicatie tussen moeder en kind nam tussen de leeftijd van 2 en 3 jaar significant toe. Deze toename was sterker voor moeders van kinderen die in het afgelopen jaar gestart waren op een

kinderdagverblijf of peuterspeelzaal of die in een buurt met een laag percentage niet-westerse immigranten woonden. In een buurt met minder niet-westerse immigranten of op een kinderdagverblijf of peuterspeelzaal worden kinderen blootgesteld aan meer taalaanbod in het Nederlands. Hierdoor gaan deze kinderen de taal zelf ook meer spreken en zetten daarmee op hun beurt hun moeders aan tot het meer spreken van de Nederlandse taal in de communicatie met de peuters. Deze tweetalige peuters oogsten dus de taal die ze zaaien.

### **Invloed van taal- en leesaanbod op woordenschat in de etnische en de meerderheidstaal**

Het verband tussen SES, taalgebruik van moeder, leesaanbod in de thuissituatie en woordenschat werd onderzocht bij 6-jarige Turks-Nederlandse kinderen voor de overgang naar groep 3, het moment waarop het formele leesonderwijs begint. Moeders rapporteerden over het taalgebruik met hun kind, de frequentie van voorlezen door beide ouders en de aanwezigheid van kinderboeken in de etnische en de meerderheidstaal. Tijdens een huisbezoek werden tests afgenomen voor het meten van de Nederlandse en Turkse woordenschat van de kinderen.

De verklaringsmodellen verschilden voor de Nederlandse en de Turkse woordenschat. De Nederlandse woordenschat was gemiddeld groter bij kinderen uit gezinnen met een hogere SES. De invloed van SES op de Nederlandse woordenschat verliep via het taalgebruik van moeder en het Nederlandse leesaanbod in huis. Moeders uit gezinnen met een hogere SES spraken meer Nederlands met hun kinderen en in die gezinnen werd ook meer voorgelezen in het Nederlands en waren er meer Nederlandse kinderboeken beschikbaar. Dit verhoogde aanbod van de Nederlandse taal was vervolgens gerelateerd aan een grotere Nederlandse woordenschat. Gezinnen met een hogere SES kunnen op financieel en educatief gebied meer investeren in het leesaanbod en ervaren minder stress die het voorlezen in het dagelijks leven in de weg kan staan (Conger & Donnellan, 2007). Voor de Turkse woordenschat werden niet dezelfde verbanden gevonden als voor de Nederlandse woordenschat. Alleen het taalgebruik door moeder was gerelateerd aan de Turkse woordenschat. Kinderen van moeders die meer Turks met hen spraken, hadden gemiddeld een grotere Turkse woordenschat.



**Context-specifieke afhankelijkheid tussen woordenschat in beide talen**

De *linguistic interdependence hypothesis* (Cummins, 1979) stelt dat de ontwikkeling van vaardigheden in de tweede taal deels gebaseerd is op vaardigheden die al ontwikkeld zijn in de eerste taal. Een context-specifieke variant op deze hypothese werd getoetst in een longitudinale studie met dezelfde 6-jarige Turks-Nederlandse kinderen als in het hierboven beschreven onderzoek. Hierin werd gekeken naar het verband tussen Turkse woordenschat en groei van de Nederlandse woordenschat en de rol van de contextuele factoren *taalgebruik* en *SES* daarin. De woordenschat van de kinderen werd gemeten voor, tijdens en na de overgang naar groep 3. Moeders rapporteerden over de taal die hun kind sprak met hen, met vader, met broers en zussen en met Turkse vrienden.

Ook in dit onderzoek bleek SES wel gerelateerd te zijn aan de Nederlandse maar niet aan de Turkse woordenschat. Kinderen uit gezinnen met een hogere SES hadden gemiddeld een grotere Nederlandse woordenschat. SES was echter geen moderator in de relatie tussen Turkse woordenschat en groei in Nederlandse woordenschat in de loop van de jaren. De relatie tussen Turkse woordenschat en groei in Nederlandse woordenschat werd gemodereerd door het taalgebruik van het kind. Een positief verband tussen Turkse woordenschat en groei in Nederlandse woordenschat was alleen aanwezig voor kinderen die relatief meer Turks spraken met anderen. Voor deze kinderen ontbreekt het veelvuldig gebruik van het Nederlands met anderen als mogelijke bron voor het ontwikkelen van de Nederlandse woordenschat. Bovendien vereist het actief gebruiken van een taal een meer gedegen verwerking van de taal (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010). Kinderen die het Turks vaker gebruiken zullen dus een meer diepgaande kennis van die taal hebben, waar ze vervolgens hun voordeel mee kunnen doen bij de ontwikkeling van het Nederlands.

**Conclusie**

De bevindingen in dit proefschrift tonen aan dat tweetaligheid meer is dan een eenvoudige optelsom van twee delen. De taalvaardigheid van tweetalige kinderen met een migrantenachtergrond in beide talen is van belang voor hun schoolprestaties. In de ontwikkeling van die taalvaardigheid spelen de etnische samenstelling van de buurt, het gebruik van kinderopvang en de SES van het gezin een rol. Deze contextuele factoren hebben invloed op het taalgebruik van moeders met hun kinderen en op het leesaanbod in de thuissituatie. De woordenschat van

de kinderen in de etnische of de meerderheidstaal is groter naarmate kinderen meer taalaanbod in die taal ontvangen. Voor kinderen die met anderen meer in de etnische dan in de meerderheidstaal spreken, bestaat er een positief verband tussen de woordenschat in de etnische taal en de groei van de woordenschat in de meerderheidstaal. In beleid en interventies gericht op verbetering van de taalvaardigheid en schoolprestaties van tweetalige kinderen met een migrantenachtergrond, dient de etnische taal niet uit het oog te worden verloren. De contextuele factoren etnische samenstelling van de buurt en gebruik van kinderopvang kunnen leiden tot een afname van het gebruik van de etnische taal, terwijl deze taal bij veelvuldig gebruik ook als een basis kan dienen voor de ontwikkeling van de meerderheidstaal. Het verbeteren van het taal- en leesaanbod in de thuissituatie kan vooral in gezinnen met een lagere SES een aanknopingspunt zijn voor het verbeteren van de taalvaardigheid en daarmee ook de schoolprestaties.

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## **CURRICULUM VITAE**

Mariëlle Prevoo werd geboren op 20 oktober 1984 in Heerlen. In 2003 behaalde zij haar VWO-diploma aan het Stella Maris College te Meerssen. In datzelfde jaar begon ze aan de opleiding Logopedie aan de Hogeschool Zuyd te Heerlen. In het laatste studiejaar van die opleiding liep Mariëlle stage bij het Centre for Hearing and Speech Services in Winneba, Ghana. Tevens nam zij in dat laatste studiejaar deel aan de HBO-masterclass waardoor ze, nadat ze in 2007 cum laude afstudeerde als logopedist, direct kon doorstromen naar de master Health Education and Promotion aan de Universiteit Maastricht. Hier studeerde zij in 2008 af. Na het behalen van haar masterdiploma werkte Mariëlle als logopedist in een verpleeghuis, in de voor- en vroegschoolse educatie (VVE) en in het regulier en speciaal basisonderwijs. Van 2009 tot 2014 werkte zij als promovenda en docent op de afdeling Algemene en Gezinspedagogiek van de Universiteit Leiden, waar zij onderzoek deed naar voorspellers en uitkomsten van taalvaardigheid van tweetalige kinderen uit gezinnen met een migrantenachtergrond. De resultaten van dat onderzoek zijn in dit proefschrift beschreven. Naast haar onderzoek verzorgde zij diverse onderwijsonderdelen voor de opleiding Pedagogische Wetenschappen. Na afronding van haar proefschrift verbleef Mariëlle twee maanden in New York voor een studiebezoek aan het Center for Research on Culture, Development and Education (CRCDE) van New York University.



## LIJST VAN PUBLICATIES

- Prevo, M.J.L.**, Malda, M., Mesman, J., Emmen, R.A.G., Yeniad, N., Van IJzendoorn, M.H., & Linting, M. (2014). Predicting ethnic minority children's vocabulary from socioeconomic status, maternal language and home reading input: Different pathways for host and ethnic language. *Journal of Child Language*, *41*, 963-984.
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- Prevo, M.J.L.**, Malda, M., Mesman, J., Yeniad, N., Emmen, R.A.G. (in press). A context-dependent view on the linguistic interdependence hypothesis: SES and language use as potential moderators. *Language Learning*.
- Prevo, M.J.L.**, Malda, M., Mesman, J., Van IJzendoorn, M.H. (2014). Within- and cross-language relations between oral language proficiency and school outcomes in bilingual children with an immigrant background: A meta-analytical study. *Manuscript submitted for publication*.

