# The effect of speaking a minority language at home on foreign language learning

Jessica Tsimprea Maluch [a,*], Sebastian Kempert [b], Marko Neumann [c], Petra Stanat [a]

[a] Institute for Educational Quality Improvement, Humboldt University, Unter den Linden 6, 10099 Berlin, Germany
[b] Humboldt University, Unter den Linden 6, 10099 Berlin, Germany
[c] German Institute for International Educational Research, Warschauer Str. 34-38, 10243 Berlin, Germany

## ABSTRACT

The study investigates the effect of immigrant bilingualism on learning English as a foreign language, controlling for confounding background variables and examining the effect of proficiency in the instructional language at school. Using a sample of 2835 German 6th-graders (Arabic-German: $n = 105$, Chinese-German: $n = 110$, Polish-German: $n = 57$, Turkish-German: $n = 383$, heterogeneous bilingual: $n = 284$, and monolingual German group: $n = 1896$), we examined if speaking another language at home in addition to the instructional language at school presents an advantageous condition for learning English as a foreign language. Controlling for cognitive abilities, age, gender, socio-economic status, parental education, and indicators of cultural capital, the analysis revealed a general positive trend between bilingualism and English foreign language achievement. This positive trend differs significantly between bilingual groups with different home languages. The strongest predictor for foreign language learning revealed to be proficiency in the instructional language.

© 2014 Elsevier Ltd. All rights reserved.

## 1. Introduction

The growing proportion of immigrant students is changing the linguistic landscape in schools. Throughout Europe, immigrant students tend to be, on average, less successful in school than their non-immigrant peers (Stanat & Christensen, 2006). In particular, students with immigrant backgrounds lag behind their native peers in reading skills in the language of instruction at school. This is true even after controlling for socio-economic background characteristics (OECD, 2010), which are factors that have been shown to play an important role in academic achievement (Scheerens & Bosker, 1997). In Germany, the discrepancy is particularly noticeable for first generation immigrant students, as well as for students who primarily speak a minority language other than German at home (e.g. Stanat, Rauch, & Segeritz, 2010).

Despite this achievement gap, some students with immigrant backgrounds, namely those who are functionally bilingual in the language of instruction at school and a minority home language, have resources that could potentially impact their foreign language learning in positive ways. Indeed, under certain circumstances bilingual students were shown to have an advantage when learning an additional language (e.g. Brohy, 2001; Cenoz & Valencia, 1994; Sanz, 2000). Bilingualism is associated with unique patterns of cognitive and linguistic processes, which differ from those of monolinguals and may foster foreign language learning. In fact, bilingual students, whose languages are officially supported by the education system and developed through formal instruction in school, tend to show significant advantages in additional language learning (Cenoz, 2003). However, it is less clear if bilingualism in other contexts, such as bilingualism due to immigration, is associated with positive foreign language learning outcomes as well.

In the present study, we seek to determine whether there is a relation between immigrant bilingualism and foreign language learning outcomes and to what extent the predicted pattern holds across bilingual groups with different instructional language proficiency and diverse home languages. In the following, we will first discuss why bilinguals can be expected to have advantages in learning additional foreign languages. Subsequently, we argue that current research potentially masks important group differences in language learning.

* Corresponding author. Institute for Educational Quality Improvement, Humboldt University of Berlin, Unter den Linden 6, 10099 Berlin, Germany. Tel.: +49 (0) 30 2093 46574; fax: +49 (0)30 2093 5336.
*E-mail address:* jessica.andrade@iqb.hu-berlin.de (J.T. Maluch).

## 1.1. Cognitive and linguistic consequences of bilingualism

Cognitive and linguistic differences between bilinguals and monolinguals have been studied in applied linguistics, psychology, and education. Since the 1960s, bilingualism has been shown to be positively related to various cognitive functions. In the landmark study by Peal and Lambert (1962) with a matched sample, bilingual children outperformed monolinguals in verbal and nonverbal tests of cognitive ability. Subsequently, bilinguals have repeatedly been shown to score higher than monolinguals on tests of various cognitive flexibility and processing functions (for reviews, see Adesope, Lavin, Thompson, & Ungerleider, 2010; Bialystok, 2009; Hamers & Blanc, 2000). Bialystok (2010) proposes that bilinguals have higher levels of executive control − the interrelated processes of inhibition, working memory, and cognitive flexibility − due to their need to switch between two language systems flexibly in varied contexts and with different interlocutors. These cognitive consequences of bilingualism are observable in non-verbal tasks (such as the Simon Task) that require controlled attention or the inhibition of routine responses. In these tasks bilinguals typically outperform monolingual controls (e.g. Bialystok, Craik, Klein, & Viswanathan, 2004).

In addition to advantages in general cognitive functions, bilingualism seems to be positively associated with *metalinguistic awareness* (Thomas, 1988), defined as "[ … ] the ability to focus attention on language as an object in itself or to think abstractly about language [ … ]" (Jessner, 2006, p.42). Studies investigating metalinguistic awareness have found that bilinguals have advantages on several metalinguistic tasks compared to monolinguals, such as applying morphological rules to unfamiliar forms (e.g. Barac & Bialystok, 2012) or explicit noticing of implicitly learned grammatical rules (e.g. Reder, Marec-Breton, Gombert, & Demont, 2013). The theoretical assumption is that bilinguals can draw upon two language systems, providing them with a larger linguistic reservoir compared to monolinguals. From this linguistic reservoir, which includes metalinguistic skills, knowledge can potentially be transferred between languages and thus may be helpful when acquiring a new language (cf. the construct of *common underlying proficiency* by Cummins, 1981; 2000). Indeed, research has shown that metalinguistic awareness is a significant predictor of foreign language reading outcomes (Dufva & Voeten, 1999; Rauch, Naumann, & Jude, 2011; Zhang & Koda, 2013). However, this relation can be complicated due to the relative proficiency level of the two languages (De Angelis, 2007; Koda, 2007). Also, individual language properties, such as differences between languages with alphabetic or logographic orthographies can play a significant role in the development of metalinguistic skills (Bialystok, 1997). It has been shown that language combinations as well as relative proficiency and exposure explain noticeable variance in tasks examining executive functions and metalinguistic awareness (Bialystok & Barac, 2012). For these reasons, it is useful to pay particular attention to the specific language groups as well as language proficiency to better understand the underlying mechanisms.

## 1.2. Factors affecting language learning

Despite the potential benefits of bilingualism discussed above, it is widely acknowledged that bilingualism does not automatically lead to cognitive and linguistic advantages (Bialystok, 2001). The sociocultural context in which language(s) are developed plays an important role in a child's cognitive and linguistic development (e.g. Vygotsky, 2012). This is especially true for such factors as socio-economic status and cultural background, which are highly correlated with language proficiency, and have the potential to mask or even negate the positive effects of bilingualism (Cenoz & Valencia, 1994; Jessner, 2008; Sanz, 2000). Low socio-economic status is typically associated with lower levels of language proficiency for all children. In the case of immigrant bilinguals, their lower language proficiency in the majority language may directly impair the development of possible bilingual advantages (Diaz, 1983). Furthermore, as background factors can systematically differ between immigrant groups (Müller & Stanat, 2006), it is important not only to take them into account but also to consider immigrant bilinguals not as a homogeneous group.

In addition to sociocultural background factors, immigrant bilingualism differs from other forms of bilingualism because the majority language is often fostered at the expense of the minority home language (Cenoz, 2003), creating unknown 'levels' of bilingualism. Despite the emphasis on becoming proficient in the majority language, immigrant bilinguals have been found to have difficulties mastering the language of instruction in school (Esser, 2006). As international and national studies show, students who speak another language at home tend to lag behind their monolingual peers in the majority language of the community (OECD, 2010), and this gap in the language of instruction can affect their academic performance across learning domains (Haag, Heppt, Stanat, Kuhl, & Pant, 2013). It may have significant effects on further foreign language learning as well for several reasons. Firstly, weak majority language students might experience difficulties in comprehending explicit information (i.e. grammar rules, explanation of abstract vocabulary) about the foreign language, as the teacher normally uses the majority language to transmit this explicit information to the student. Secondly, students who are weak in the majority language have limited resources with which to engage linguistic transfer, i.e. the ability to learn skills in a new language based on previously acquired language resources (Genesee, Geva, Dressler, & Kamil, 2006).

In conclusion, bilingualism may lead to advantages in additional language learning, yet several factors can affect this process, especially background characteristics and language proficiency. Failing to take these factors into account may be leading to biased conclusions in empirical studies and potentially masking possible advantages for immigrant bilingual groups.

## 1.3. Immigrant bilingualism and language learning: empirical evidence

As mentioned above, a variety of factors can influence bilingual development and consequently additional language learning, namely background characteristics (i.e. socio-economic status, cultural capital) as well as individual language characteristics and proficiency. Studies in which both languages of the examined bilinguals are officially supported by the education system through bilingual or foreign language instruction typically show significant advantages of bilinguals in third language acquisition. For example, with a sample of 17−19 year olds from the Basque Country, Cenoz and Valencia (1994) found a significant positive relation between being a Basque-Spanish bilingual (compared to a Spanish monolingual) and English language ability given similar levels of general cognitive abilities, age, motivation and exposure to the foreign language. This positive association was also replicated for English language achievement with a sample of Catalan-Spanish bilinguals and Spanish monolinguals (Sanz, 2000), as well as with French achievement in a sample of Romansch-German bilingual and Romansch monolingual children (Brohy, 2001). These results, replicated across several sociolinguistic contexts, suggest that when schools support the formal development of both languages (i.e. leading to high proficiency in both languages), bilingualism is positively associated with further language learning.

Studies examining foreign language learning among immigrant bilingual samples have yielded an unclear picture. In contrast to students enrolled in multilingual programs, immigrant bilinguals' home language is typically developed outside the formal school system and supported largely through the efforts of the family. For example, in the national population of Swedish eighth graders ($n = 69.903$), a heterogeneous group of immigrant bilingual students who use only their native language at home showed no advantages compared to their Swedish monolingual classmates on a standardized English test (Mägiste, 1984). However, students who used both Swedish and another language at home outperformed the Swedish monolingual students suggesting that the development in the instructional language leads to positive transfer in third languages. In a study examining bilingual immersion programs, Swain, Lapkin, Rowen, and Hart (1990) found that in a Canadian setting, speaking what they termed 'a heritage language' at home only had an advantage in French when the students had a certain level of proficiency (i.e. literacy) in their home language. However, neither study took into account sociocultural background factors in the analyses.

In the Netherlands, Sanders and Meijers (1995) examined Turkish-Dutch and Arabic-Dutch bilingual fifth and sixth graders. Based on a sample matched for cognitive abilities and socio-economic status, the authors found no differences between the bilingual and monolingual groups in a variety of English language skills (grammatical judgment, spontaneous language use, word comprehension and word recognition). These findings partially mirror the results of another Dutch study, where no significant differences were found between a sample of monolingual 14-year olds and their mixed bilingual classmates with regard to English vocabulary, grammar, and word recognition (Schoonen et al., 2002; Van Gelderen et al., 2003). Instead, the monolinguals significantly outperformed their immigrant bilingual peers in two English language measures of reading and sentence verification as well as Dutch reading proficiency, vocabulary and grammatical knowledge. Yet, again, in none of the two aforementioned studies with samples of immigrant bilingual students did the authors control for background characteristics of the students, such as socio-economic status, which has been found to be a significant factor in the achievement gap of immigrant and non-immigrant students (e.g. Stanat & Christensen, 2006; Walter, 2008). As group membership and sociocultural factors may be confounded with each other, this may obscure results.

The *German English Student Assessment International* (DESI) did control for important background factors and provide strong contrary evidence to these previous studies. In a national representative sample of approximately 11,000 ninth graders, a heterogeneous group of bilingual students outperformed their monolingual peers in English listening comprehension, grammar, reading and text writing skills (Hesse, Göbel, & Hartig, 2008). In fact, the results of this study suggest that given similar social background, general cognitive abilities, gender and school track, speaking a minority language at home is positively associated with English language learning (Klieme, 2006). Even students with an exclusively non-German language home environment significantly outperformed their non-immigrant background monolingual classmates. These findings present strong evidence that, given comparable background characteristics as their monolingual peers, immigrant bilinguals may have advantages in additional language learning even if they lag behind in the language of instruction used at school. However, because of the heterogeneity of the immigrant bilinguals in the study, it is unclear if this is the case for all bilingual groups.

In a reanalysis of DESI with a sample of successive bilinguals controlling for general cognitive abilities, school track and socio-economic status, Turkish-German, Russian-German and Polish-German successive bilingual students had no significant advantage in their English proficiency compared to their German monolingual peers, but a significant positive effect was found for a heterogeneous compound bilingual group (Göbel, Rauch, & Vieluf, 2011). Because the division between successive and compound bilingual groups lead to small bilingual group sizes, it is unclear if these results reflect a lack of differences between the successive bilingual and monolingual groups or inadequate statistical power. Similarly comparing Turkish-German bilinguals and German monolinguals, Rauch, Jurecka, and Hesse (2010) found no effect of bilingualism on English language reading achievement after controlling for school track and socio-economic status. These contrasting results between the three DESI analyses suggest that the effect of bilingualism may vary across groups.

In addition to the large contrast in sociocultural and linguistic background characteristics, which might account for the varying results in the aforementioned studies, another important factor that can affect foreign language learning is the proficiency level in the language of instruction. Most studies to date have concentrated on the relation between bilinguals' first and second languages. For example, in a sample of language minority speakers, Spanish literacy skills at the entry of school resulted in higher English literacy skills 6–8 years later (Reese, Garnier, Gallimore, & Goldenberg, 2000). To date, only a few studies have investigated the relation between second language ability and additional foreign language learning. In the Swiss context, Haenni Hoti et al. (2011) found that second language competencies in English (L2) played a significant role in predicting both foreign language French (L3) listening and reading comprehension. Similarly in the context of immigrant bilingualism, German second language reading competencies was highly correlated with proficiency in English as a foreign language for Turkish-German students (Rauch et al., 2010). This suggests that the proficiency in the language of instruction may be an important factor for foreign language learning.

In sum, there is a lack of clear evidence on the relation between immigrant bilingualism and additional language learning outcomes, and further investigations are needed taking into account the key factors in this process, namely the potentially confounded effects of sociocultural background variables and language of instruction proficiency. To establish a basis for less ambiguous interpretations, bilingual individuals with different instructional language proficiency as well as diverse language backgrounds should not be treated as a homogeneous group, as separation according to proficiency and language combinations account for differences with respect to linguistic properties and socio-cultural factors between groups. Further, the consideration of confounding variables, such as socio-economic status, is pivotal for adequate comparisons between various groups.

### 1.4. Research questions

In the present study, we explore the possible benefits of immigrant bilingualism with respect to foreign language achievement. Specifically, the study explores the following research questions:

1. Does speaking another language at home (L1), as well as the majority language at school (L2), provides an advantage in learning English (L3) at school? To what extent does the majority language at school play a role in foreign language achievement for immigrant bilingual students?

   Previous research (i.e. Cenoz & Valencia, 1994; Hesse et al., 2008) suggests that, once controlling for individual and familial background factors, the bilingual students will, on average, have higher scores in English as a foreign language compared to

the monolingual group. Therefore we hypothesize similar advantages for the bilingual students in the present sample (Hypothesis 1a). However, as other studies have found, the expected advantage of bilingualism depends also on the individuals' proficiency in the language of instruction (i.e. Haenni Hoti et al., 2011). Because of the strong association between bilingual students' instructional language and foreign language achievement (Rauch et al., 2011), we expect an advantage for bilinguals over monolinguals if they have relatively stronger skills in the language of instruction. Furthermore, it is theorized that bilingual students with weaker majority language proficiency in contrast do not have a sufficient linguistic reservoir to support positive transfer. Therefore, we expect that they demonstrate no advantages and will lag behind their monolingual peers as well as their bilingual peers with strong majority language proficiency (Hypothesis 1b).

2. To what extent do different bilingual language groups vary regarding their proficiencies in English as a foreign language (L3)?

Despite the general positive association between immigrant bilingualism and foreign language learning that we expect to find (Hypothesis 1a), this general pattern should differ significantly between bilingual language groups. Theory suggests that some combinations of languages may have the potential to support foreign language learning more than others due to analogies in linguistic properties and alphabetic scripts between the languages (De Angelis, 2007). However, to date little is known about specific combinations of languages and their respective outcome compared to other combinations. As an explorative hypothesis, we expect that given similar background characteristics and instructional language proficiency groups will generally differ with regard to their advantageous potential. Specifically, we test the hypothesis that combinations of languages with similar orthographic scripts (i.e., Polish-German and Turkish-German) as the dependent variable L3 will have the highest potential compared to combinations which differ in their scripts (i.e., Arabic-German and Chinese-German).

## 2. Methods

### 2.1. Participants

The following analyses are secondary analyses of data from the Assessment of Reading and Mathematics Development Study (ELEMENT), which followed a cohort of children from the fourth grade to the sixth grade (Lehmann & Lenkeit, 2008). Data were collected from a representative sample of students from a major European city, whose population has about 15% of students who speak another language than German at home (Senate Administration for Education, Science, & Research, 2008). This investigation focuses on data from the sixth grade elementary school sample. Although after the fourth grade, there is the option of attending the *Gymnasium*, the university-bound school track, the majority of students (93%) attend the elementary school (*Grundschule*) until the end of the sixth grade (Lehmann & Lenkeit, 2008). The study's sample is representative for the public elementary school students ($N = 2946$).

To identify bilingual groups, we analyzed the language spoken at home as well as the frequency of the language spoken at home as reported by the parents and students. Inclusion into one of the language groups was determined when the parents reported that a language other than German (the specific language was also identified) was regularly spoken in the home. If the parents' information was missing (24%), the information provided by the student was

used. For 111 students, there was no language information from either the parents or the students. The final sample included in our analysis consists of $N = 2835$ students nested in 134 elementary school classes (48.5% female; $M_{age} = 12.6$ years; $R_{age} = 10.7–15.3$ years). From the aforementioned criterion, we identified the monolingual group ($n = 1896$) and the bilingual group ($n = 939$). We further differentiated the bilingual students into four bilingual language groups based on the information about the languages spoken at home provided by the parents (Arabic-German: $n = 105$, Chinese-German: $n = 110$, Polish-German: $n = 57$, Turkish-German: $n = 383$). All the other bilingual groups, which were not large enough to be analyzed separately, were combined into a composite 'other' bilingual group (languages including French, Italian, Russian, Vietnamese and others; $n = 284$). Given our substantive interest in patterns across groups, we included this group in the analyses to inquire if it shows similar trends as the other bilingual groups.

In a second approach, to analyze the role of instructional language proficiency in the context of a potential bilingual advantage in L3 learning, the bilingual group was divided into five proficiency groups from a standardized competency scale. Based on the results of the German reading test (Baumert, Lüdtke, Trautwein, & Brunner, 2009; Lehmann & Lenkeit, 2008), which consisted of 32 questions about four texts and scaled using one-parameter item response theory in ConQuest (Wu Adams, & Wilson, 1998), the bilingual group was subdivided into five groups (Bilingual German Level 1: $n = 27$, Bilingual German Level 2: $n = 120$; Bilingual German Level 3: $n = 273$; Bilingual German Level 4: $n = 294$; Bilingual German Level 5: $n = 225$).

Within the bilingual students, 41% of the parents reported that their children were raised bilingually from birth (early bilinguals). The rest of the bilingual children were successive in their bilingual development. However, by the time they entered first grade, 87% of the parents of bilingual students reported that their children had good German skills, which was similar to that of the monolingual group (85%). When asked about their bilingual language practices, bilingual children reported that they mostly spoke German with their friends (80%) and classmates (73%). Among their parents, grandparents and siblings, most students reported speaking at least a little German as well as a minority language in their home environment. Very few bilingual students reported having solely minority language home environments (12%).

### 2.2. Measures

#### 2.2.1. English language achievement

English language achievement was assessed with a Cloze test (Lehmann & Lenkeit, 2008). The test consists of four texts with 91 word completion questions measuring reading proficiency, vocabulary, grammar and spelling simultaneously. The items were scaled based on one-parameter item response theory in ConQuest (Wu et al., 1998). We used weighted likelihood estimates (WLEs) for individual person parameters. The WLEs were scaled with a mean parameter estimate of $M = 100$ and a standard deviation of $SD = 20$.

#### 2.2.2. Control variables

In our analysis, we utilized the control variables of general cognitive abilities, gender, age, socio-economic status, parental education, and cultural capital. As general cognitive abilities might systematically differ across groups, we used a composite score of two subtests of the CFT4-12R: verbal and figural analogies (Heller & Perleth, 2000). This test consists of 25 picture and 20 word tasks subtests and was administered in the fourth grade. The test-retest reliability for this age group is $r_{analogies} = 0.83$ and $r_{figural} = 0.93$ (Heller & Perleth, 2000). Gender and age were reported in the fifth and sixth grade student questionnaires.

**Table 1**

Sample means (and standard deviations) of the dependent and control variables for bilingual and monolingual students.

|  | German Monolingual $n = 1896$ | Bilingual group $n = 939$ |
|---|---|---|
| English ability | 97.28 (19.13) | 91.12 (18.55) |
| Age at sixth grade | 12.49 (0.49) | 12.71 (0.70) |
| Socio-economic status | 50.30 (14.80) | 38.80 (14.59) |
| Parental education | 3.64 (1.09) | 3.13 (1.39) |
| Cultural capital | 2.75 (1.03) | 1.67 (0.96) |
| German proficiency | 112.46 (12.02) | 104.29 (11.74) |

Note: Descriptive statistics were calculated using the first imputed dataset.

Several aspects of students' social and cultural background were assessed with the parent and student questionnaire. To measure the family's socio-economics status, we used the International Socio-Economic Index (ISEI; Ganzeboom & Treiman, 1996), with the highest score of the two parents' socio-economic status (HISEI) serving as an indicator of family socio-economic status. The highest education of the parents was measured on a five-point scale with one indicating no qualification and five indicating a college-bound school diploma. Finally, to operationalize cultural capital, we used the number of books at home as a proxy variable, which was assessed on a four-point scale with one indicating 0–25 books and four indicating over 200 books.

### 2.3. Missing data and statistical analyses

As is usually the case with longitudinal large-scale data, there is a certain number of missing values in the dataset. This primarily stems from the lower response rate (60%) of the parents compared to the performance instruments as well as the attrition rate between fourth and sixth grade (7%). Consequently, we conducted all analyses using five imputed datasets, in which the missing values were replaced by plausible values (Lehmann & Lenkeit, 2008). The multiple imputation was based on a specified background model, which included the individual-level factors of grades, self-concept, interest and motivation as well as the classroom-level factors of achievement, socio-economic status and percentage of students with immigration background (Lehmann & Lenkeit, 2008). The results of the analyses for the five datasets were combined using option type = imputation in MPlus 5.21 (Muthén & Muthén, 1998–2008). All multiple regression analyses were conducted in MPlus 5.21 taking into account the nested nature (students in classes) of the dataset (type = complex). The descriptive statistics reported below are based on the first imputed dataset with Bonferroni adjustment for all multiple comparisons.

## 3. Results

### 3.1. Descriptive statistics

To investigate the relation of bilingualism and foreign language learning, we first conducted descriptive analyses with the

dependent variable English language achievement and the background control variables for the monolingual and bilingual groups (see Table 1). The dependent variable English proficiency varies significantly between the monolingual and bilingual groups ($t = 7.74$, $p < .001$, 95% CI [4.34, 7.28], $d = .33$) with the monolingual group having noticeably higher levels of English proficiency. This is also the case for the control background characteristics of socio-economic status ($t = 19.05$, $p < .001$, 95% CI [9.98, 12.27], $d = 0.78$), parental education ($t = 9.74$, $p < .001$, 95% CI [0.40, 0.60], $d = 0.41$), and cultural capital ($t = 27.70$, $p < .001$, 95% CI [1.00, 1.15], $d = 1.08$). Furthermore, the German monolingual group has noticeably higher German proficiency than their bilingual peers ($t = 17.31$, $p < .001$, 95% CI [7.24, 9.09], $d = 0.69$).

We next examined the individual bilingual language groups more closely (Table 2). On the dependent variable English proficiency, there is significant variation across language groups ($F(5, 2829) = 28.84$, $p < .001$, $\eta_p^2 = .22$). The Chinese-German and Polish-German groups performed similarly to the German monolingual group, while the Turkish-German and Arabic-German groups performed below the monolingual group.

With regard to the background variables, there are noticeable between-group differences for the measure of HISEI, with the monolingual group having the highest HISEI, on average, and the Turkish-German and Arabic-German showing the lowest HISEI mean scores ($F(5, 2829) = 80,42$, $p < .001$, $\eta_p^2 = .35$). In a similar vein, Turkish-German, Arabic-German as well as other bilingual group show lower parental education than the other groups ($F(5, 2929) = 44,93$, $p < .001$, $\eta_p^2 = .27$). Another marked difference is the relatively low level of cultural capital (operationalized with the reported number of books at home) of the Arabic-German group and the Chinese-German group in comparison to all the other groups ($F(5, 2929) = 151.13$, $p < .001$, $\eta_p^2 = .46$). The German monolingual group has a larger number of books at home, on average, than all other groups.

### 3.2. Bilingualism and English achievement

Given our substantive interest in immigrant bilingualism and foreign language achievement (research question 1a), we fit two regression models testing if immigrant bilingualism is positively associated with English foreign language achievement (Table 3). First, we specified an uncontrolled model with the bilingual group as a dichotomous variable compared to the monolingual reference group (Model A). Similar to the results of the descriptive statistics, membership to the bilingual group is negatively associated English achievement. However, this negative relation is reversed once the background characteristics of general cognitive abilities, age, gender, socio-economic status, parental education, and cultural capital have been taken into account (Model B). Given comparable individual and familiar background characteristics bilingual group membership is positively associated with English foreign language achievement.

To investigate the effect of majority language proficiency in the bilingual groups (Hypothesis 1b), we next repeated the regression

**Table 2**

Sample means (and standard deviations) of the dependent and control variables by language group.

|  | German Monolingual $n = 1896$ | Arabic − German $n = 105$ | Chinese − German $n = 110$ | Polish − German $n = 57$ | Turkish − German $n = 383$ | Other bilingual $n = 284$ |
|---|---|---|---|---|---|---|
| English ability | 97.28 (19.13) | 83.00* (19.60) | 100.63 (17.40) | 102.24 (17.08) | 88.51* (17.01) | 91.40* (18.41) |
| Age at sixth grade | 12.49 (0.49) | 12.78* (0.74) | 12.55 (0.57) | 12.57 (0.54) | 12.65* (0.64) | 12.67* (0.80) |
| Socio-economic status | 50.30 (14.80) | 36.25* (14.00) | 41.46* (13.89) | 42.77* (13.67) | 37.23* (13.53) | 40.03* (16.18) |
| Parental education | 3.64 (1.09) | 2.86* (1.46) | 3.45 (1.42) | 4.07 (1.15) | 2.76* (1.33) | 3.41 (1.29) |
| Cultural capital | 2.75 (1.03) | 1.49* (0.83) | 1.76* (1.09) | 2.09* (1.01) | 1.56* (0.90) | 1.75* (0.98) |
| German proficiency | 112.81 (11.85) | 99.29* (11.45) | 111.13 (10.84) | 111.69 (10.39) | 101.32* (10.80) | 106.02* (11.45) |

Note: Descriptive statistics were calculated using the first imputed dataset. Bonferroni corrected multiple comparisons with monolingual reference group: *$p < .01$.

**Table 3**
Multiple regression models explaining English achievement of bilinguals.

| Variable | Model A | Model B | Model C | Model D |
|---|---|---|---|---|
| Intercept | 97.28*** | 92.02*** | 90.00*** | 91.15*** |
| Bilingual (=1) | −5.94*** | 2.68** | | |
| Bilingual German Level 1 | | | −16.45 | −13.60 |
| Bilingual German Level 2 | | | −13.83 | −10.31 |
| Bilingual German Level 3 | | | −5.76 | −4.37 |
| Bilingual German Level 4 | | | 3.45 | 2.25 |
| Bilingual German Level 5 | | | 17.09~ | 12.49 |
| General Cognitive Abilities | | 6.10*** | | 3.30*** |
| Age[1] | | −5.67*** | | −3.66*** |
| Gender (girls = 1) | | 4.89*** | | 4.40*** |
| HISEI[2] | | 2.21*** | | 0.90 |
| Parent Qualification[2] | | 2.26*** | | 0.74 |
| Cultural Capital[2] | | 1.46*** | | 0.57 |
| Explained Variance ($R^2$) | 0.02 | 0.30 | 0.34 | 0.41 |

~$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.
Note: [1] Centered; [2] z-score.

**Table 4**
Multiple regression models explaining English achievement of bilingual language groups.

| Variable | Model A | Model B | Model C | Model D |
|---|---|---|---|---|
| Intercept | 97.29*** | 93.17*** | 92.04*** | 91.94*** |
| Arabic-German | −14.61*** | −7.00** | −3.12 | 1.02 |
| Chinese-German | 3.15~ | 4.44** | 7.08*** | 6.08*** |
| Polish-German | 5.44* | 6.19** | 7.30*** | 6.80*** |
| Turkish-German | −8.26*** | −2.08~ | 1.90~ | 5.01*** |
| Other bilingual | −5.40*** | 0.65 | 2.86* | 3.71** |
| General Cognitive Abilities | | 6.90*** | 5.91*** | 2.40*** |
| Age[1] | | −6.83*** | −5.60*** | −3.64*** |
| Gender (girls = 1) | | 4.67*** | 4.87*** | 3.94*** |
| HISEI[2] | | | 2.22*** | 1.07* |
| Parent education[2] | | | 2.08*** | 1.29** |
| Cultural Capital[2] | | | 1.45*** | 0.35 |
| German Reading Proficiency[2] | | | | 9.56*** |
| Explained Variance ($R^2$) | 0.05 | 0.26 | 0.30 | 0.46 |

~ $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.
Note: [1] grand mean centered; [2] z-score.

analyses with five 'dummy' variables for bilingual groups with different levels of German proficiency compared to the monolingual reference group. In Model C, we fit an uncontrolled model with the bilingual groups. As shown in Table 3, there is a general trend that for bilingual students the higher the level of German reading is associated with increased achievement in English. Bilingual students with weak German skills (Levels 1–3) have weaker English language achievement than their monolingual peers. Conversely, bilingual students with strong German skills (Level 4–5) have higher English achievement than their monolingual peers. This trend remains once background characteristics have been taken into account (Model D) although the differences between groups are not statistically significant.

### 3.3. Patterns in English achievement across bilingual language groups

To investigate immigrant bilingualism and English achievement in more detail, we differentiated between five bilingual language groups (research question 2). We fit four multiple regression models testing if immigrant bilingual group membership is positively associated with English foreign language achievement across the bilingual groups (see Table 4).

Model A represents an uncontrolled model of English Language ability with the five bilingual groups as independent 'dummy' variables compared to the monolingual reference group. In Model B, we added the individual control factors of general cognitive ability, age, and gender. In Model C, the family characteristics HISEI, parental education and cultural capital were included in the model as additional control factors, and finally, in Model D, we controlled for German language proficiency.

In Model A, we specified an uncontrolled model with the different language groups as independent variables. As the descriptive statistics showed, there is significant inter-group variation among the bilingual groups. The Polish-German group performs significantly higher than the monolingual group. The Chinese-German group does not display any significant advantages or disadvantages compared to the German monolingual group. The Turkish-German and Arabic-German bilingual groups score significantly lower than the monolingual reference group. Overall, the membership in the monolingual or a bilingual group explains five percent of the variance in students' English language achievement. However, because of the marked differences in background variables the descriptive statistics revealed, we next included these potentially confounding factors in the subsequent models to hold their impact constant on the relation between bilingual group membership and English language achievement.

In Model B, we controlled for students' age, gender and general cognitive abilities. All three variables add substantive explanatory power to the model ($R^2 = 0.26$). While positive effects were found for cognitive abilities and for the female gender, there was a negative effect of age on English language achievement, probably resulting from students with lower proficiency levels repeating grades. After controlling for these background factors, the difference in magnitude between the monolingual group and the bilingual groups that had an advantage in Model A (Chinese-German and Polish-German) increased moderately, resulting in a larger advantages for the two bilingual groups. For the bilingual groups who had a significant disadvantage in Model A (Turkish-German, Arabic-German and Other Bilingual), the disparity with the monolingual groups diminished noticeably. Indeed, once controlling for general cognitive abilities, gender and age, the Turkish-German bilingual group and the Other Bilingual group have, on average, no longer significant disadvantages and similar levels of English achievement as their monolingual peers.

Next, we added family background characteristics to the model (Model C). As expected, HISEI as well as parents' school education play an important role, as does the cultural capital of the family. This model explains 30% of the variation in English language ability. Given similar socio-economic status, parental education, cultural capital, general cognitive abilities, age and gender, three of the five bilingual groups have a significant advantage in English language achievement in comparison to their monolingual peers, while the remaining bilingual groups do not differ significantly from their monolingual peers. The bilingual group with the largest advantage is the Polish-German group, the Chinese-German group continues to have a significant advantage, and the heterogeneous bilingual group now also shows a significant advantage in their English language achievement compared to their monolingual peers. There is no longer a significant disadvantage for the Turkish-German or the Arabic-German group, demonstrating that once confounded background variables are controlled, these two bilingual groups perform similarly to their monolingual peers.

Fig. 1 depicts the results for Model C, illustrating the pattern for each group in comparison to the German monolinguals as the reference group. Given similar individual and familial background characteristics, the Chinese-German, Polish-German and heterogeneous bilingual groups show significant advantages in their English language achievement in comparison to their monolingual peers with a non-significant advantage for the Turkish-German group. The Arabic-German group, who performed significantly lower than all other groups in Model A, did not perform

significantly different from their monolingual classmates after controlling for background variables. Despite differences between groups, Model C shows strong evidence that, controlling for confounded background variables, most bilinguals students, on average, tend to have higher English languages achievement than their monolingual counterparts in the sixth grade.

As a final step (Model D, Table 4), we included German language proficiency in the regression analysis of English language achievement remaining the background variables used in the previous regression models. Confirming the importance of the instruction language found in the first analysis (research question 1b) German language proficiency turns out to have a strong positive relation with English language achievement with a noticeable increase of explained variance ($R^2 = 0.46$). Further, entering German reading proficiency into the model and therefore given comparable German reading proficiency between the monolingual and bilingual groups, all bilingual groups except the Arabic-German group, have a strong significant advantage in their English language achievement. The regression coefficients for the Chinese-German, Polish-German and other bilingual groups change slightly from Model C to D. However, the coefficient of the Turkish-German group alters noticeably and now has a strong significant advantage to their monolingual counterparts. Although no significant advantage is detected in the Arabic-German group, whose German skills were comparable to those of the Turkish-German group (see Table 2), the Arabic-German group has comparable English language achievement to that of the monolingual group.

## 4. Discussion

In the present study, we examined if speaking an immigrant minority language as well as the majority language has a positive effect on English foreign language achievement. Additionally, analyses aimed at identifying the role of L2 proficiency in the context of a potential bilingual advantage in L3 learning and finally, whether the results hold true for different bilingual language groups. All comparisons of the different groups of elementary school students were conducted controlling for sociocultural background factors and general cognitive abilities.

To this end, we first evaluated bilingual and monolingual students' achievement in English as a foreign language. Because proficiency in the instructional language is often assumed to be an important determinant of additional language ability (De Angelis, 2007) and in the German context there is a significant difference in German language outcomes between students with and without an immigrant background (Stanat et al., 2010), we examined if and to what extent bilingual students with different proficiency in the instructional language, German, varied in their English language achievement. Further, we compared five bilingual groups' achievement in English as a foreign language with that of their monolingual peers.

Regarding our first research question the results provide evidence that immigrant bilingualism can have significant advantages for learning English as a foreign language. The general trend suggests that, given comparable background characteristics, children who speak a minority language at home have, on average, stronger foreign language achievement (Hypothesis 1a). These results reinforce the theoretical assumption that speaking another language at home supports the cognitive and metalinguistic development of individuals, which results in enhanced foreign language learning outcomes. However, it should be noted that while being bilingual was found to be associated with higher English language achievement, bilingual group membership only accounted for a small portion of the overall explained variance ($R^2 = .02$) compared to the background characteristics. Furthermore, the bilingual group had a relatively slight advantage ($\beta = 2.68$), which can be interpreted as just over a quarter of a school year's achievement (Hill, Bloom, Black, & Lipsey, 2008). Our findings parallel those revealed in the DESI study (Hesse et al., 2008), which also found advantages for German bilingual students. At the same time, they contrast with the findings of earlier studies with immigrant bilinguals in the Netherlands (Schoonen et al., 2002; Van Gelderen et al., 2003), which found no advantages for the bilingual groups. Varying methodologies, specifically the lack of the consideration of potentially confounding background variables as well as statistical power of the varying samples in the two Dutch studies, could explain these inconsistent conclusions.

Although there is a general positive association, instruction language proficiency plays a major role in foreign language outcomes. In line with the hypotheses, the results of the group comparisons provide evidence that bilingual students with strong instructional language skills have advantages in learning English as a foreign language, whereas bilingual students who are weak in the instructional language, do not perform as well as their monolingual
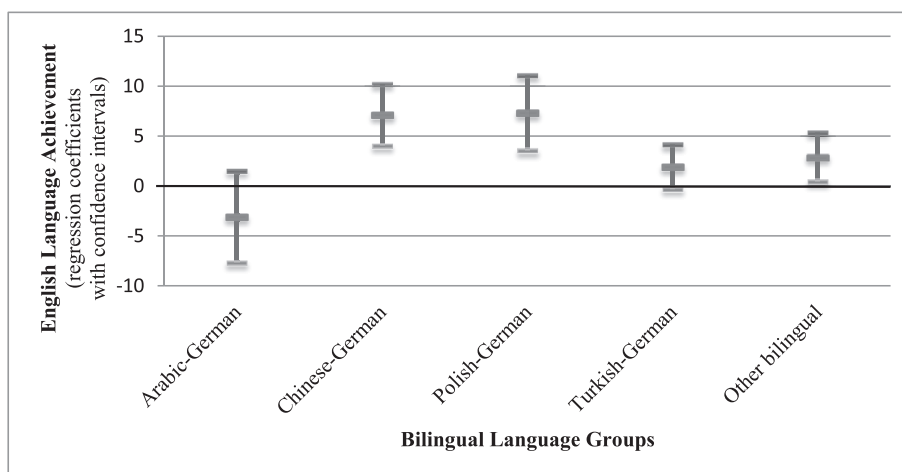


Note: Monolingual references group mean = zero

**Fig. 1.** Group differences (with 95% confidence intervals) in English foreign language achievement across different bilingual groups compared with monolingual classmates controlling for individual and familial background characteristics.

peers (given comparable background characteristics) (Hypothesis 1b). It should be noted that but despite a relatively large portion of explained variance, the group differences were not significant. This might be due to a lack of statistical power of the five subgroups. These results replicate earlier findings, which conclude that only students that are strong in the language of instruction have benefits in learning an additional language (Mägiste, 1984).

While there was a general positive trend for the bilingual students, this pattern varied across the five bilingual groups in our subsequent analyses (Hypothesis 2). Contrary to our hypotheses, which focused on linguistic typology and distance between the languages of the bilingual groups and English, the Chinese-German students had a strong and significant advantage in their English achievement ($\beta = 7.08$) as did the Polish-German students ($\beta = 7.30$). Both groups' achievement was almost 0.40 of a standard deviation, which can be translated to almost one year in achievement ahead of their monolingual peers (Hill et al., 2008). The strong performance of the Chinese-German group is rather surprising given the diverse linguistic properties of the two languages. In addition, there was an advantage found for the heterogeneous bilingual group. These results differ from those of Göbel et al. (2011), who found no advantage for the Polish-German bilinguals. The lack of differences for the Polish-German bilinguals in their study might be due to the relatively small sample size of the Polish-German group in comparison to the monolingual group.

After controlling for background factors, the Turkish-German students had a small advantage by trend, although this difference was not significant from the monolingual group ($\beta = 1.90$). This replicates the findings of Sanders and Meijers (1995) as well as Rauch et al. (2010), who found that Turkish-German bilingual students did not significantly differ in their English achievement from their monolingual peers. However, as Sander and Meijers stress, these results can be interpreted as positive given the large lack of achievement gap between bilingual students and their monolingual peers found in other school subjects, which is also the case with the current sample (Lehmann & Lenkeit, 2008).

The one group who did not show any advantages was the Arabic-German students ($\beta = -3.12$). It is notable that while this group initially had large disadvantages in their English achievement, the difference between Arabic-German bilingual and monolingual students was no longer significant after controlling for background variables. These results replicate the findings of Sanders and Meijers (1995), who found no significant differences in English achievement between Arabic-Dutch bilingual and Dutch monolingual students. This difference in the findings for the Arabic-Germans might be due to several factors. First, as theorized in the literature, this could be due to the language distance between the Arabic language and English. Yet, the Chinese-German students, whose home language has even greater language distance, did not display this achievement gap. A more probable reason might be the less pronounced literacy experiences of Arabic immigrant children at home. Asbrand, Lang-Wojtasik, and Köller (2005), for example, explained weak Arabic literacy development with the extreme differences between spoken and formal (written) Arabic and the effect of a rather oral language culture of Arabic. This comparatively weaker literacy development might affect further language learning, both in the instructional language and in formal foreign language learning as Wagner, Spratt, and Ezzaki (1989) point out.

Finally, once German language had been entered into the model, all bilingual groups except the Arabic-German students had a significant advantage in their English achievement. Similar to other findings (i.e. Haenni Hoti et al., 2011; Rauch et al., 2010) and in line with the results of our first analysis these results show that the language of instruction is an important factor explaining a substantial portion of the variance ($\Delta R^2 = 16\%$). Yet, given comparable

levels of German proficiency between monolingual and bilinguals, almost all bilingual groups sustain or even increase their significant benefits in foreign language learning. This suggests that in the context of immigrant bilingualism, the language of instruction has specifically strong power in predicting foreign language outcomes. As the results show, a one-point increase in German language is associated with almost ten points on English achievement. However, as several of the bilingual groups have significant advantages in their English language achievement, speaking a minority home language also support the language learning under certain conditions.

It is interesting to note that while bilingual group membership did add significant explanatory power to the regression analyses, it explains less variance than that of the background characteristics taken together. This mirrors the findings of Cenoz and Valencia (1994) whose results, although showing significant advantages for bilingual students, had relatively smaller effect sizes for bilingualism than other background characteristics. In the present study, the most important predictor of foreign language outcomes remains the language of instruction and background characteristics with bilingualism adding a small but significant explanation to English achievement. Further variation could be explained through variables assessing bilinguals' home language proficiency as well as affective and motivational factors.

Taken together these results have several strong implications for learning and instruction. Firstly, it is imperative for educators to be aware of the unique ability and linguistic resources of bilingual children in the foreign language classroom. Continued support for strong instructional language skills should be a priority in formal and informal learning environments (i.e. Stanat, Becker, Baumert, Lüdtke, & Eckhardt, 2012). This will improve all students' foreign language learning outcomes as well as in other subjects in school and especially assist with bilingual students' overall linguistic reservoir. Despite other individual and background characteristics that might result in varying learning outcomes, bilingual students' unique linguistic skills should be explicitly seen as a resource. As this study highlights, much of the achievement gap in foreign language learning between immigrant bilingual and monolinguals stems from the systematic individual and familial differences, such as parents' education. It should be noted that although membership to an immigrant bilingual group is positively associated with English language ability once controlling for these background factors, it is impossible for educators to parcel out all factors within a child. However, it is important to understand fully from where achievement gaps stem and which resources may potentially serves in a compensatory way. As this study successfully shows, immigrant bilingualism is not a hindering factor, but rather it can be positively associated with foreign language learning outcomes. This speaks to the general benefit of knowing and using two languages, even if one of the languages is not formally supported in the education system.

### 4.1. Limitations and implications for future research

Despite the largely consistent findings, our study has several limitations. One limitation is the lack of a measure of home language proficiency. Group membership was based on the specification in the parental questionnaire which language was spoken regularly in the home. Although this is a more conservative estimate than the inquiring if the student has knowledge of another language, there was no measure directly assessing the level of proficiency in that language. Although a certain level of proficiency can be assumed if the students speak this language regularly at home, a measure of home language proficiency, and specifically literacy skills, is likely to explain further individual variation in and

potentially also variation between bilingual language groups. A measure of home language literacy would be particularly salient, as theoretical assumptions often presupposes a certain level of proficiency in both languages for the cognitive and linguistic benefits of bilingualism to appear (Bialystok, 2001; De Angelis, 2007; Swain et al., 1990). While this investigation provides an important step in investigating different immigrant bilingual groups and their foreign language learning, further research should address the effect of home language proficiency, the language of instruction and that of third language learning in school for immigrant bilinguals.

Another important avenue for further research should focus on the mechanisms, namely metalinguistic awareness, that are expected to mediate the language learning process directly. This large-scale study provides evidence that speaking a minority language – even one that is not explicitly taught in the education system - can provide a student with unique skills and abilities, which are especially salient for education in the foreign language classroom. With further research into these mechanisms and their effect on language learning, educators can better tap into the abilities of their students, and curricula can more accurately reflect needs of not only monolingual but the increasing population of bi- and multilingual children present in the classroom. As educational systems around the world are increasing tackling the changing demographics in the classroom, the importance of identifying not only potential weakness, but strengths, is increasingly important for successful learning. As immigrant bilingual students are often labeled as facing difficult challenges, it is also important to remember that those challenges are coupled with benefits, which in some areas of learning, can further their academic success.

## References

Adesope, O. O., Lavin, T., Thompson, T., & Ungerleider, C. (2010). A systematic review and meta-analysis of the cognitive correlates of bilingualism. *Review of Educational Research, 80*(2), 207–245. http://dx.doi.org/10.3102/0034654310368803.

Asbrand, B., Lang-Wojtasik, G., & Köller, O. (2005). Lesekompetenz in sehr leistungsschwachen Ländern–eine interkulturelle Sekundaranalyse der Leseleistungen in IGLU [Reading competence in weak countries – an intercultural secondary analysis of reading achievement in IGLU]. In W. Bos, E. Lankes, M. Prenzel, K. Schwippert, R. Valtin, & G. Walther (Eds.), *IGLU: Vertiefende Analysen zu Leseverständnis, Rahmenbedingungen und Zusatzstudien* (pp. 37–79). Münster: Waxmann.

Barac, R., & Bialystok, E. (2012). Bilingual effects on cognitive and linguistic development: role of language, cultural background and education. *Child Development, 83*, 413–422. http://dx.doi.org/10.1111/j.1467-8624.2011.01707.x.

Baumert, J., Lüdtke, O., Trautwein, U., & Brunner, M. (2009). Large-scale student assessment studies measure the results of processes of knowledge acquisition: evidence in support of the distinction between intelligence and student achievement. *Educational Research Review, 4*, 165–176. http://dx.doi.org/10.1016/j.edurev.2009.04.002.

Bialystok, E. (1997). Effects of bilingualism and biliteracy on children's emerging concepts of print. *Developmental Psychology, 33*, 429–440.

Bialystok, E. (2001). *Bilingualism in development: Language, literacy, and cognition.* Cambridge: Cambridge University Press.

Bialystok, E. (2009). Consequences of bilingualism for cognitive development. In J. Kroll, & A. De Groot (Eds.), *Handbook of bilingualism: Psycholinguistic approaches* (pp. 417–432). Oxford: Oxford University Press.

Bialystok, E. (2010). Bilingualism. *Cognitive Science, 1*, 559–572. http://dx.doi.org/10.1002/wcs.43.

Bialystok, E., & Barac, R. (2012). Emerging bilingualism: dissociating advantages for metalinguistic awareness and executive control. *Cognition, 122*(1), 67–73.

Bialystok, E., Craik, F. I. M., Klein, R., & Viswanathan, M. (2004). Bilingualism, aging, and cognitive control: evidence from the Simon task. *Psychology & Aging, 19*, 290–303.

Brohy, C. (2001). Generic and/or specific advantages of bilingualism in a dynamic plurilingual situation: the case of French as official L3 in the school of Samedan (Switzerland). *International Journal of Bilingual Education and Bilingualism, 4*(1), 38–49.

Cenoz, J. (2003). The additive effect of bilingualism on third language acquisition: a review. *International Journal of Bilingualism, 7*(1), 71–87. http://dx.doi.org/10.1177/13670069030070010501.

Cenoz, J., & Valencia, J. (1994). Additive trilingualism: evidence from the Basque Country. *Applied Psycholinguistics, 15*, 195–207. http://dx.doi.org/10.1017/S0142716400005324.

Cummins, J. (1981). *Bilingualism and minority language children.* Ontario: Ontario Institute for Studies in Education.

Cummins, J. (2000). The threshold and interdependence hypotheses revisited. In J. Cummins (Ed.), *Language, power and pedagogy: Bilingual children in the crossfire* (pp. 173–200). Clevedon: Multilingual Matters Ltd.

De Angelis, G. (2007). *Third or additional language learning.* Clevedon: Multilingual Matters.

Diaz, R. M. (1983). Thought and two languages: the impact of bilingualism on cognitive development. *Review of Research in Education, 10*, 23–54.

Dufva, M., & Voeten, M. J. M. (1999). Native language literacy and phonological memory as prerequisites for learning English as a foreign language. *Applied Psycholinguistics, 20*(03), 329–348.

Esser. (2006). *Migration, language and integration* (AKI Research review 4). Berlin: Social Science Research Center.

Ganzeboom, H. B. G., & Treiman, D. J. (1996). Internationally comparable measures of occupational status for the 1988 international standard classification of occupations. *Social Science Research, 25*, 201–239.

Genesee, F., Geva, E., Dressler, C., & Kamil, M. L. (2006). Synthesis: cross-linguistic relationships. In D. August, & T. Shanahan (Eds.), *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth* (pp. 153–183). Mahwah, NJ: Erlbaum.

Göbel, K., Rauch, D., & Vieluf, S. (2011). Leistungsbedingungen und Leistungsergebnisse von Schülerinnen und Schülern türkischer, russischer und polnischer Herkunftssprachen [Conditions and achievement of students with Turkish, Russian and Polish migration backgrounds]. *Zeitschrift für Interkulturellen Fremdsprachenunterricht, 16*(2), 50–65.

Haag, N., Heppt, B., Stanat, P., Kuhl, P., & Pant, H. A. (2013). Second language learners' performance in mathematics: disentangling the effects of academic language features. *Learning and Instruction, 28*, 24–34.

Haenni Hoti, A. U., Heinzmann, S., Müller, M., Oliveira, M., Wicki, W., & Werlen, E. (2011). Introducing a second foreign language in Swiss primary schools: the effect of L2 listening and reading skills on L3 acquisition. *International Journal of Multilingualism, 8*(2), 98–116. http://dx.doi.org/10.1080/13670050108667718.

Hamers, J., & Blanc, M. (2000). *Bilinguality and bilingualism* (2nd ed.). Cambridge: Cambridge University Press.

Heller, K. A., & Perleth, C. (2000). *Kognitiver Fähigkeitstest für 4.-12. Klassen, Revision (KFT 4-12)* [*General Cognitive Abilities test for 4-12 graders, revised*]. Göttingen: Hogrefe.

Hesse, H., Göbel, K., & Hartig, J. (2008). Sprachliche Kompetenzen von mehrsprachigen Jugendlichen und Jugendlichen nicht-deutscher Erstprache [Language competence of multilinguals whose mother tongue is not German]. In DESI (Ed.), *Unterricht und Kompetenzerwerb in Deutsch und Englisch: Ergebnisse der DESI Studie DESI Konsortium* (pp. 208–230). Weinheim: Beltz Verlag.

Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2008). Empirical benchmarks for interpreting effect sizes in research. *Child Development Perspectives, 2*(3), 172–177.

Jessner, U. (2006). *Linguistic awareness in multilinguals: English as a third language.* Edinburgh: Edinburgh University Press.

Jessner, U. (2008). Teaching third languages: findings, trends, and challenges. *Language Teaching, 41*(1), 15–56. http://dx.doi.org/10.1017/S0261444807004739.

Klieme, E. (2006). *Zusammenfassung zentraler Ergebnisse der DESI-Studie.* Frankfurt a. M.: Deutsches Institut für Internationale Pädagogische Forschung.

Koda, K. (2007). Reading and language learning: crosslinguistic constraints on second language reading development. *Language Learning, 5*(1), 1–44. http://dx.doi.org/10.1111/j.0023-8333.101997010-i1.

Lehmann, R., & Lenkeit, J. (2008). *ELEMENT. Erhebung zum Lese- und Mathematikverständnis. Entwicklungen in den Jahrgangsstufen 4 bis 6 in Berlin* [*ELEMENT: Assessment of reading and mathematics literacy. Developments in grades 4 to 6 in Berlin*]. Berlin, Germany: Humboldt University of Berlin.

Mägiste, E. (1984). Learning a third language. *Journal of Multilingual and Multicultural Development, 5*(5), 415–421.

Müller, A. G., & Stanat, P. (2006). Schulischer Erfolg von Schülerinnen und Schülern mit Migrationshintergrund: Analysen zur Situation von Zuwanderern aus der ehemaligen Sowjetunion und aus der Türkei [School success of immigrant students: Analyses of the situation of immigrants from the former Soviet Union and Turkey]. In *Herkunftsbedingte Disparitäten im Bildungswesen: Differenzielle Bildungsprozesse und Probleme der Verteilungsgerechtigkeit* (pp. 221–255). VS Verlag für Sozialwissenschaften.

Muthén, B. O., & Muthén, L. K. (1998). *Mplus (Version 5.21)[Computer software].* Los Angeles, CA.

OECD. (2010). *PISA 2009 results: Overcoming social background: Equity in learning opportunities and outcomes* (Vol. II).

Peal, E., & Lambert, W. (1962). The relationship of bilingualism to intelligence. *Psychological Monographs, 76*, 1–23.

Rauch, D., Jurecka, A., & Hesse, H. (2010). Für den Drittspracherwerb zählt auch die Lesekompetenz in der Herkunftssprache [The importance of reading competence in the heritage language for third language acquisition]. *Zeitschrift für Pädagogik, 55*.

Rauch, D. P., Naumann, J., & Jude, N. (2011). Metalinguistic awareness mediates effects of full biliteracy on third-language reading proficiency in Turkish–German bilinguals. *International Journal of Bilingualism, 16*(4), 402–418. http://dx.doi.org/10.1177/1367006911425819.

Reder, F., Marec-Breton, N., Gombert, J. E., & Demont, E. (2013). Second-language learners' advantage in metalinguistic awareness: a question of languages'

characteristics. *British Journal of Educational Psychology, 83*, 686–702. http://dx.doi.org/10.1111/bjep.12003.

Reese, L., Garnier, H., Gallimore, R., & Goldenberg, C. (2000). Longitudinal analysis of the antecedents of emergent Spanish literacy and middle-school english reading achievement of Spanish-speaking students. *American Educational Research Journal, 37*(3), 633–662. http://dx.doi.org/10.3102/00028312037003633.

Sanders, M., & Meijers, G. (1995). English as L3 in the elementary school. *ITL: Review of Applied Linguistics, 107*(8), 59–78.

Sanz, C. (2000). Bilingual education enhances third language acquisition: evidence from Catalonia. *Applied Psycholinguistics, 21*, 23–44.

Scheerens, J., & Bosker, R. J. (1997). *The foundations of school effectiveness.* Oxford: Pergamon Press.

Schoonen, R., van Gelderen, A., de Glopper, K., Hulstijn, J., Snellings, P., & Stevenson, M. (2002). Linguistic knowledge, metacognitive knowledge and retrieval speed in L1, L2 und EFL writing. In S. Ransdell, & M. Barbier (Eds.), *New directions for research in L2 writing.* Dordrecht: Kluwer Academic Publishers.

Senate Administration for Education, Science & Research. (2008). *Bildungsbericht* [*Educational Report*]. Berlin.de: Das offizielle Hauptstadtportal. Retrieved: July 17, 2013 from http://www.berlin.de/sen/bildung/bildungsstatistik/.

Stanat, P., Becker, M., Baumert, J., Lüdtke, O., & Eckhardt, A. G. (2012). Improving second language skills of immigrant students: a field trial study evaluating the effects of a summer learning program. *Learning and Instruction, 22*(3), 159–170.

Stanat, P., & Christensen, G. (2006). *Where immigrant students succeed: A comparative review of performance and engagement in PISA 2003.* Organisation for Economic Co-operation and Development.

Stanat, P., Rauch, D., & Segeritz, M. (2010). Schülerinnen und Schüler mit Migrationshintergrund [Students with migration background]. In E. Klieme, C. Artelt, J. Hartig, N. Jude, O. Köller, M. Prenzel, et al. (Eds.), *PISA 2009. Bilanz nach einem Jahrzehnt* (pp. 200–230). Münster: Waxmann.

Swain, M., Lapkin, S., Rowen, N., & Hart, D. (1990). The role of mother tongue literacy in third language learning. *Language, Culture and Curriculum, 3*(1), 65–81.

Thomas, J. (1988). The role played by metalinguistic awareness in second and third language learning. *Journal of Multilingual and Multicultural Development, 9*, 235–246.

Van Gelderen, A., Schoonen, R., deGlopper, K., Hulstijn, J., Snellings, P., Simis, A., et al. (2003). Role of linguistic knowledge, metacognitive knowledge and processintg speed in L3, L2 and L1 reading comprehension: a structural equation modeling approach. *International Journal of Bilingualism, 7*(7), 7–25.

Vygotsky, L. (2012). *Language and thought.* Cambridge, MA: Massachusetts Institute of Technology Press.

Wagner, D., Spratt, J., & Ezzaki, E. (1989). Does learning to read in a second language always put the child at a disadvantage? Some counterevidence from Morocco. *Applied Psycholinguistics, 10*(1), 31–48.

Walter, O. (2008). Herkunftsassoziierte Disparitäten im Lesen, der Mathematik und den Naturwissenschaften: ein Vergleich zwischen PISA 2000, PISA 2003 und PISA 2006 [Background-associated disparity in reading, mathematics, and science: a comparison between PISA 2000, 2003 & 2006]. *Zeitschrift für Erziehungswissenschaft, 10*(Sonderheft 10), 149–168.

Wu, M. L., Adams, R. J., & Wilson, M. (1998). *ACER ConQuest: Generalised item reponse modelling software.* Acer Press.

Zhang, D., & Koda, K. (2013). Morphological awareness and reading comprehension in a foreign language: a study of young Chinese EFL learners. *System, 41*(4), 901–913.