https://doi.org/10.20378/irbo-51697

Chapter 6

6 Social and Immigration-Specific Differences in the Development of Reading Comprehension: A Longitudinal Analysis of Primary School Students in Germany

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Summary

According to the theory of social reproduction, parents' cultural habits, activities, and goods have large impacts on children's skills, knowledge, competencies, and educational attainment (Bourdieu, 1974; Bourdieu & Passeron, 1977). The cultural mobility model is less restrictive and less unidirectional than the theory of social reproduction. According to the cultural mobility model, students from lower social classes, in particular, can promote their school performance if they invest in cultural activities, thus attenuating the relation between their parents' class position and their own school success (Aschaffenburg & Maas, 1997; DiMaggio, 1982). In recent times, the school performance of students from immigrant families has been the focus of attention. Cultural capital is often context specific

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This research was supported by grants BL 381/7-1, BL 381/7-2, and BL 381/7-3 from the German Research Foundation (DFG).

We thank Kristine Blatter (University of Bamberg) and Volker Stocké (University of Kassel) for their helpful comments on a draft of this chapter.

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and might lose its value as a consequence of immigration. Therefore, the relation between parents' cultural capital and students' school success should be weaker. However, according to the cultural mobility model, the relation between students' own cultural capital and school success should be stronger.

To provide new evidence on this topic, we analyzed panel data with value-added models on reading literacy from Grades 3 to 4. The data were derived from the BiKS-8-14 longitudinal study (Educational Processes, Competence Development, and Selection Decisions in Preschool- and School-Age Children) that have been collected in two German states since 2006.

Our empirical analysis on progress in reading showed that the gap in reading comprehension between students from families with low and high education increases across time. There is evidence that participation in highbrow culture fosters progress in reading comprehension, especially when parents participate in such activities. In addition, the amount of reading in which a student engages has a strong influence. However, no effects could be found for the amount of time parents read newspapers or books, the number of books at home, or children's use of libraries. Our results provide support for theories on social reproduction (strong influence of parents' education and highbrow activities), but are also consistent with an extended version of the cultural mobility model (the influence of students' reading habits). Most indicators of various forms of cultural capital have similar effects in native and immigrant families.

In the sociology of education, the concept of "cultural capital" has been intensively debated and used in research for explaining social inequality in educational attainment. The term was brought into sociology and familiar disciplines by Bourdieu (1974; Bourdieu & Passeron, 1977). Subsequent studies have been more or less connected to this concept. DiMaggio's (1982; DiMaggio & Mohr, 1985) contributions and re-interpretation in particular have been very influential in the English-speaking research community (for a review, see Lareau & Weininger, 2003). However, despite similarities, there are also substantial differences between these two concepts. Major

discrepancies concern the breadth of cultural capital and the potential to make strategic investments in cultural capital to promote the upward mobility of offspring from less privileged families.

Stemming from the general concept of cultural capital, research has tried more and more to figure out which kind of cultural capital generates advantages in which educational areas. Researchers ask which aspects are relevant for the acquisition of cognitive competencies, which factors influence teachers' grading practices, and which kind of cultural capital is of special importance for the parent-teacher interaction. The main mechanisms that are discussed are socialization, cognitive stimulation, and signaling. In addition, a broad research strand has focused on reading habits. In sociology, this is often done under the headline of cultural capital (De Graaf, De Graaf & Kraaykamp, 2000; Sullivan, 2001). Current educational research is looking closer at the development and educational careers of children raised by immigrants, but little research has been conducted on the importance of cultural capital for educational success in immigrant families. As cultural capital is often context specific, it might be obliterated after a family immigrates to a new country.

In this chapter, we investigate the importance of cultural capital for the development of reading comprehension in primary school in Germany. We focus on mechanisms that foster reading literacy development. Therefore, we differentiate between cultural capital that refers to parental education, cultural goods (e.g., books in the household), participation in the elite culture (e.g., beaux arts), and individual reading habits. Furthermore, concerning the elite culture and reading habits, we distinguish between parents' and students' activities. We also discuss whether and how the importance of cultural capital varies between native and immigrant students.

Explanations and Previous Findings on the Importance of Cultural Capital: Social Reproduction, Cultural Mobility, and Reading Habits

Bourdieu's work (Bourdieu, 1974; Bourdieu & Passeron, 1977) is the point of departure for the concept of cultural capital. Thereby, his notion of cultural capital embraces not only educational certificates and cultural goods, but also "inculcated forms" such as abilities, skills, knowledge, and taste. Furthermore, cultural capital in an embodied

state is primarily acquired in the family of the student, but as students grow older, it can also be acquired in school. Children enter the education system with different cognitive abilities and skills as well as behavior modes, which may be in part the product of class-specific socialization processes (Hart & Risley, 1992; Petrill, Deater-Deckard, Schatschneider, & Davis, 2005; Rodríguez-Brown, 2011). Bourdieu (1974; 1986; Bourdieu & Passeron, 1977) supposes that those better endowed by their families profit more from schooling and acquire new competencies much faster. In addition, the origin of the cultural capital should make a difference. Those who had the opportunity to learn from their families are designated by ease, whereas those who primarily acquired cultural capital in school are pedantic because people reveal their origin as they apply their cultural capital (Bourdieu, 1984). However, there is a lack of explicit explanation for how the transmission of cultural capital from parents to children occurs.

It is important to note that Bourdieu's (1984) approach belongs to the so-called conflict theories. According to these theories, social classes have different interests and the dominant social classes try to preserve their privileges across time and generations. In Bourdieu's version, cultural capital is crucial for securing these advantages. In general, the dominant classes impose study content, and school teachers favor children from the dominant classes because of their higher linguistic skills, specific knowledge, effort, and style. Teachers pay more attention to students from the privileged classes and give them better grades, even if they only perform as well as other students (cf. Lorenz, 2011). The function of the education system is to provide the students of the upper social classes with the highest educational degrees and students from the lower classes with lower degrees while pretending that these differences are merit based. This process of legitimation masks the intergenerational reproduction of classes, also known as social reproduction.

DiMaggio and Mohr's (1985) point of departure is Weber's (1922/1978) distinction between class and status ("Stand"). The first is defined by position and life chances in a market economy, whereas the second is defined by honor (social prestige), lifestyle, and social closure. In developed market economies, the relation between class and status is assumed to be loose, but "[t]he ability to participate in a status culture is a cultural resource that permits actors to get ahead" (DiMaggio & Mohr, 1985, p. 1235).

In other words, DiMaggio and Mohr's aim is to extend the established measure of class positions derived by occupation or educational attainment and to include indicators of status, especially of interest and participation in status culture. In this approach, parental education is an indicator of class position, whereas cultural participation is an indicator of status.

Modern societies may be characterized by affluence, democracy, mass media, consumption, and so forth. Even or just because of these conditions, status is still relevant for social positioning or achieving interests and goals. "(...) the status culture (...) retains its interactional potency for several reasons. First it has become a significant part of the formal educational system and, through that system, has been diffused, as a cultural model, throughout the class structure. Second, it is preserved through status emulation by many members of the middle class, who have adopted both the cultural tradition and the ideology that legitimates it. Third, interest in and familiarity with high culture are still related to class position, albeit imperfectly (...). Finally, high-culture activities (...) are still primarily dominated by occupants of high class positions" (DiMaggio & Mohr, 1985, pp. 1236-1237). So, what are the mechanisms relating cultural capital to students' attainment? It's "(a) increasing their opportunities for special help from teachers and other gatekeepers, (b) permitting them to develop generalized reputations as 'cultured persons', and (c) facilitating access to social milieus in which education is valued and in which information about educational opportunities is available" (DiMaggio & Mohr, 1985, p. 1240). Taken together, the mechanisms relating cultural capital to students' attainment do not highlight positive influences for academic achievement, but rather positive evaluation and recognition by significant others (Laureau & Weininger, 2003).

Comparing these different approaches, three major differences between the work by Bourdieu (Bourdieu, 1974; Bourdieu & Passeron, 1977) and the work by DiMaggio and Mohr (1985) become apparent: First, according to Bourdieu, the main function of the education system is to mask social reproduction. By contrast, DiMaggio and Mohr do not make such an assumption. Second, according to DiMaggio and Mohr, students coming from the lower or middle classes can have access to high-status culture and can profit from this access to high-status culture in terms of educational outcomes or in the labor market as well as the marriage market. In Bourdieu's theory, however,

students from the lower or middle classes will not be able to change or improve their class position. Finally, DiMaggio and Mohr distinguish between parental education as a class indicator and cultural participation and interest as status indicators. We do not, however, find such a distinction in the work by Bourdieu.

Empirical Studies Relating Social Reproduction, Cultural Capital, and Educational Success

An important empirical contribution was provided by Aschaffenburg and Maas (1997), who tested rival hypotheses derived from Bourdieu's theory of social reproduction and DiMaggio's approach to cultural mobility. In their study, Aschaffenburg and Maas investigated whether and how parental cultural capital and students' participation in highbrow art impacted transitions in students' educational careers in the US. Students' cultural activities, such as performing or taking theoretically oriented lessons in music and the visual arts and taking performance classes such as in ballet and acting, were surveyed of students of different ages and thereby at different stages in the education system and by context. The context refers to activities in and outside of school. Activities in school should be accessible to all students, whereas activities outside of school should depend more strongly on the resources and initiative of the family. The four transitions under study were the beginning and termination of high school as well as the beginning and termination of college. They found that students' participation in cultural activities went hand in hand with higher probabilities of completing an educational stage and making the transition to the next educational stage. Furthermore, current activities were found to be more important for differences in the transition rates compared to earlier activities. Finally, the effects of different cultural activities were found to weaken over the educational careers of the students. Cultural activities outside the school, which may be mainly induced by the family, were found to have a stronger impact than voluntary cultural activities in school. Nevertheless, activities in school remained relevant. In addition, students' cultural activities had positive impacts on transitions in the education system even if parental capital was taken into account. Conclusively, all these findings are highly consistent with the cultural mobility model. Obviously, the assumption about social reproduction in its strictest sense – that parents' cultural capital is inculcated in children before they enter

school and that advantages and disadvantages are amplified by the student's school career – does not hold. Nevertheless, in three of the four educational transitions in the study, parents' cultural participation was positively associated with transitions, giving some credit to the theory of social reproduction.

Several attempts have been made to distinguish between different types of cultural capital in order to provide further insight into the mechanisms that relate cultural capital to educational success. Thereby, the development of academic achievement has been given greater attention. Some studies, for example, have discriminated between participation in beaux arts (e.g., theater, museums) and reading behavior. The first is seen as an indication that the student belongs to some status group, which is recognized and positively valued by teachers, whereas the second is a more direct way to enhance cognitive skills (e.g., vocabulary or text comprehension). De Graaf, Dirk, De Graaf, and Kraaykamp (2000), for example, found empirical evidence from the Netherlands indicating that parental reading is relevant for educational success, more so than mere participation in the field of highbrow art. "(...) parents who read frequently not only set the norm for their children, but exhibit more human capital and therefore can enhance their offspring's linguistic and cognitive skills" (DeGraaf et al., 2000, p. 98). Comparable results were reported by Crook (1997) for Australia. In addition, Cheung and Andersen (2003) provided evidence for the long-term effects of children's reading in leisure time. They analyzed data from the British National Child Development Study (NCDS) based on a sample of children born in 1958, with surveys at ages 11, 16, 23, and 33. Children's reading behavior at age 11 was positively related to the results of a general cognitive test conducted at the same age, national school examinations at age 16, the school type attended at the secondary level, and whether the student received a university degree. Then, in a study based on German primary and secondary school students, McElvany, Becker, and Lüdtke (2009) provided evidence for a model in which different measures of social class were related to the development of reading comprehension. Major parts of these social disparities in reading comprehension were mediated by cultural resources and activities of the parents, such as visiting libraries jointly with their children or making presents of books to their children.

One of the most fine-grained studies on cultural capital was provided by Sullivan (2001). She asked students in the 11th grade about their type and amount of reading, television viewing, music listening, music playing, as well as their participation in public and cultural events in England. In the case of reading and television viewing, she coded the answers about book titles and television programs according to their cultural content. In addition, students were tested on their knowledge of famous cultural figures and on their vocabulary (Sullivan, 2001, p. 899). The students also reported on their parents' cultural activities. "These [parents'] activities include reading (and number of books in the home), newspapers taken, type of music and radio stations listened to, participation in 'formal culture', and the subjects discussed by parents in the home" (Sullivan, 2001, p. 900). Moreover, Sullivan had access to students' results in the General Certificate of Secondary Education (GCSE). Her major findings were the following: The higher the family's class position, the more culturally active were the parents and students. Furthermore, the relation between social class and students' cultural activities was mediated by parents' cultural activities. Parents' cultural activities were correlated with students' vocabulary and cultural knowledge. But if students' cultural habits were taken into account, parents' cultural activities lost their ability to predict the results of the language indicator. Sullivan's research showed that reading and watching "relatively sophisticated" television programs were positively correlated with the results in both test domains. No such positive correlation could be found for participation in cultural events and listening to classical music (including playing an instrument). Regarding the results of the GCSE, the findings were comparable at a first step, but if vocabulary and knowledge tests were taken into account in multivariate models, students' reading and television viewing did not have any contribution. In line with previous research, but relying on more detailed indicators, Sullivan (2001) concluded that the process of cultural transmission is via cognitive enhancement and not via the signaling of status membership.

Finally, studies based on data from the Programme for International Student Assessment (PISA) have provided cross-national evidence on the importance of cultural capital for educational success. In his analysis based on data from 25 Western countries, Barone (2006) found that cultural capital, which was defined as possessing culture-related goods in the family household and engaging in parent-child

communication about cultural topics, was correlated with school performance in all countries. In addition, cultural goods and communication partly mediated the relation between parents' socio-economic status and students' performance. However, substantial parts of the relation between parents' socio-economic status and students' academic performance remained unexplained, thus producing the hypothesis that the applied indicators of cultural goods and activities might not be sufficient for explaining this relation. In other words, one must consider the idea that additional features related to the socio-economic situation of the parents such as ambitions and educational aspirations may also have substantial relevance.

Cultural Capital and Students' Performance in Immigrant Families

There is not much research on the importance of cultural capital for educational success in immigrant families compared to native families. Furthermore, the rare studies that have compared the importance of cultural capital of families with and without immigration backgrounds have provided evidence that is quite mixed. According to Nauck, Diefenbach, and Petri (1998), the relations between parents' cultural and economic resources as measured by the highest educational degree and the need-adjusted household income and children's secondary school attainment are much weaker in immigrant than in native families. Based on a sample of primary school students in inner London, comparable findings were reported by Strand (1999). Although the author had only a proxy indicator of the cultural and economic capital of the family (i.e., the entitlement to a free school meal), he found quite strong interactions with students' ethnic-cultural background. The social gap in students' school performance in reading, writing, and mathematics between students who received a free school meal and students who did not receive such social support was highest for non-immigrant English students. However, smaller disparities were found for students with African, Caribbean, Indian, Pakistani, and any other immigration background.

Based on data from Germany, Kristen and Granato (2007) reported weaker relations between parental education level and the child's chances of receiving a general university entrance qualification (*Abitur*) for families with Turkish origin than for native German ones. However, these results could not be confirmed when students

from families hailing from Greece, Italy, Spain, Portugal, or the former Yugoslavia were considered. In her study focusing on the cultural knowledge of preschoolers aged 3 to 4, Becker (2010) provided additional insight into the role of speaking the German language for Turkish immigrant families. First, the author reported differences in the amount of cultural knowledge between children from Turkish families and natives as well as differences between children raised in families that were more or less engaged in activities such as "telling stories to child, reading books to child, (...) ever visited a zoo or circus, a library, and a museum or a theater" (Becker, 2010, p. 22). In general, children from Turkish families scored lower and children in more active families scored higher. For the Turkish students, however, Becker (2010) reported an interesting finding: A higher level of family activities went hand in hand with higher cultural knowledge scores the more often the family spoke German, the language of the receiving country. In other words, the amount of German language used by the members of immigrating families was found to moderate the effect of cultural activities on the development of cultural knowledge of the host country. The author assumed that with a higher rate of German language use in the family, the cultural content acquired by the cultural activities more and more resembled the cultural content found in families of the receiving country.

Leopold and Shavit (2013) provided a seminal contribution on the mechanisms (i.e., cognitive enhancement vs. signaling) responsible for the relation between cultural capital and school success. Therefore, they also took into account whether the cultural capital related to the country of origin of the immigrants was useful in the education system of the receiving country. The authors analyzed reading comprehension scores and grades in Hebrew and mathematics of immigrant students from the former Soviet Union and natives in Grades 4, 9, and 11 in Israel and found that "(...) immigrants and natives do not differ with regard to the effects of parental cultural capital on reading comprehension as measured by standard test scores. However, the two groups differ significantly in the effects of cultural capital on teachers' grades. The grades assigned to native students in both math and Hebrew are positively related to parents' reading behavior (as indicated by the number of books at home) and to their cultural habits, tastes, and cultural competencies, but among immigrants these relationships are much weaker or nil" (Leopold & Shavit, 2013, p. 10).

In the end, what can we conclude with regard to the role of cultural capital in educational attainment for immigrant and non-immigrant students? First, parents' human capital and certificates acquired before immigration are not always (fully) recognized in the labor market of the receiving country. This can impede economic progress and the ability to achieve higher social positions (Friedberg, 2000; Chiswick, 1978). In addition, the intergenerational transmission of cultural capital and the process of students' educational attainment might be hampered. Cultural resources are often context specific. The highbrow culture of one society might be unknown or less valued in another one; for example, the classical authors might differ in French, German, Russian, Turkish, or Vietnamese contexts. In this case, the student's knowledge of and attachment to the highbrow culture of the (parents') country of origin might not contribute to school achievement and might not serve as a signal to teachers (Leopold & Shavit, 2013).

Second, language skills can also be conceptualized as a context-specific cultural resource, which loses some of its potential in the process of immigration (Chiswick & DebBurman, 2004). Research on the importance of the use of the dominant (school) language indicates that students perform better if their family members predominantly speak the language of the receiving country at home (Kristen, 2008; Stanat & Christensen, 2006).

Third, on the other hand, there might be spillover effects of cultural capital from one language context to the other language context; for the controversial discussion of spillover effects concerning (second) language acquisition, see Cummins (2003) and Esser (2006). For some forms of cultural capital, this means that although the capital was acquired in or is related to the country of origin, it might also influence the student's educational attainment in the host country. If cultural transmission mainly takes place via habits, the language and context specificity of cultural consumption would be rather irrelevant. Parents might go on reading books written in the language used in their country of origin so that their children have an increased probability of reading too even though the children may predominantly use texts written in the language of the receiving country.

Research Questions

Although the BiKS longitudinal study provides several further possibilities, this chapter is exclusively dedicated to reading comprehension as the outcome to be explained. Furthermore, cultural capital should be more relevant for the acquisition of competencies and skills in language domains than in mathematics and science. Competencies in mathematics and science are mainly acquired in school, whereas a large proportion of the learning and practicing opportunities in the language domain is provided by the family. In this chapter, we focus on three major research questions:

1) What is the contribution of different forms of cultural capital on students' reading comprehension?
2) Does the impact of cultural capital on reading comprehension differ between students from native and immigrant families?
3) Do we find that the evidence favors the social reproduction theory or the social mobility model? According to the social reproduction theory, a child's cultural capital and school performance is a direct function of the parents' cultural capital (formal education, cultural activities, possession of cultural goods, etc.), whereas the cultural mobility model gives special credit to the child's activities. In contrast to DiMaggio and colleagues, who emphasized only the signaling effect of cultural activities, we further extended the social mobility model to the effect of cognitive stimulation on students' cognitive development.

In order to provide answers to these three questions, we distinguished between parental education, number of books in the household as cultural goods (reproduction), and the children's use of libraries (mobility), the children's and parents' highbrow activities as well as the amount of reading, and how much the German language is used in families with immigration backgrounds.

Method

Sample

All analyses refer to data collected within the framework of the Bamberg BiKS-8-14[1] longitudinal study. The interdisciplinary BiKS research group, founded in 2005, consists of researchers from disciplines such as education, psychology, and sociology (cf. Lorenz, Schmitt, Lehrl, Mudiappa & Roßbach, chapter 2, this volume). In this chapter, we used data from the second cohort, which traced the development of students from the third grade up to the ninth grade (cf. von Maurice et al., 2007). In total, data from $N = 2{,}395$ primary school students attending 155 classes at 82 different schools were available. In elementary school, students were tested three times. The first measurement point took place at the beginning of the second term of Grade 3. Consecutive measurement points took place in the middle of the first term of Grade 4 and finally at the end of the second term of Grade 4. After the transition into secondary school, data collection took place annually at the end of the academic year. Students were tested with a broad battery of competence measures. In addition, student data collected through standardized questionnaires were available. The students' parents participated in a computer-assisted telephone interview (CATI). And finally, a questionnaire for the students' teachers comprising questions about the school class composition, teaching methods, and the educational background of the teacher as well as questions about individual children participating in the study was administered.

The current chapter presents data from the first and third measurement point, when the students attended the third and fourth grades, respectively. Cases with unit nonresponse, which includes both students who had not been tested and parents who had not provided an interview at one or both testing points, were excluded from all analyses ($n = 785$; 32.8%). Further, $n = 136$ (5.7%) cases were excluded due to item nonresponse, resulting in a final sample of $n = 1{,}474$ students and their parents used in our analyses. Parents respectively students remaining in the sample differed in some characteristics from those being excluded: For example, parents remaining in the

[1] BiKS is the acronym for the German title "Bildungsprozesse, Kompetenzentwicklung und Selektionsentscheidungen im Vor- und Schulalter," which means "Educational Processes, Competence Development, and Selection Decisions in Preschool and School Age" in English.

sample were better educated (13.7 vs. 12.9 years) and had less often an immigration background (17.4 vs. 36.1%). Students remaining in the sample performed better in the first reading test (48.1 vs. 51.3).

The average age of the students in the analyzed sample was 9.2 years in Grade 3 and 10.3 years in Grade 4. Seven hundred sixty-eight (52.1%) students were male and 706 (47.9%) students were female.

Measures

The dependent variable was *reading comprehension* at the end of the fourth grade (measured at the third measurement point). Because we focused on changes in reading comprehension, we also took into account reading comprehension in the middle of the third grade (measured at the first measurement point). At the first measurement point, reading comprehension was measured by a sample of 13 short texts with 20 multiple-choice items from the subscale "text comprehension" of the "Ein Leseverständnistest für Erst- bis Sechstklässler" (ELFE 1-6; Lenhard & Schneider, 2005). At the third measurement point, the ELFE subscale "text comprehension" was lengthened by adding three new texts with six multiple-choice items developed by the BiKS research group. This test elongation was necessary in order to avoid ceiling effects. For the reading comprehension test, the students had to read a given text, search the relevant information, and generate inferences from the text to answer the given items. Test time was limited to 7 min for the entire reading comprehension test. The item difficulty parameters were estimated within an IRT framework assuming a 1-parameter Rasch model with a Gaussian population distribution. In a first step, item difficulty parameters were estimated for the 26 reading comprehension items used at the third measurement point. Subsequently, the item difficulty parameters of the 20 reading comprehension items used at the first measurement point were fixed to guarantee a common metric. The individual student's ability was estimated by Weighted Likelihood Estimates (WLEs) using the ConQuest software package (Wu, Adams, Wilson, & Haldane, 2007). WLE scores were subsequently T-standardized ($M = 50$, $SD = 10$) based on the first measurement occasion. The internal consistencies (Cronbach's α) of the measures were satisfactory for all time points ($\alpha_{time\ 1} = .88$, $\alpha_{time\ 2} = .87$, and $\alpha_{time\ 3} = .89$).

In order to take parents' cultural resources into account, the highest qualification they achieved was used, measured in *years of education*. This scale covers the typical institutional time spent in school, vocational training, and tertiary education for achieving a certain qualification and ranges from 7 years for no formal certificate up to 18 years for a university degree (cf. Helberger, 1988).

As an indicator of cultural possessions in the family, we relied on the *number of books in the household*. Parents reported possessing *no* (codes as 0), *less than 11* (1), *11 to 50* (2), *51 to 100* (3), *101 to 250* (4), *251 to 500* (5), or *more than 500 books* (6).

Parents were asked if the child reads for pleasure. The possible answers were yes, every day (coded as 3), yes, several times a week (2), less often (1), or hardly ever or never (0).

Parents provided information about the *child's cultural activities* at the first measurement point (third grade). They indicated how often they attended the following together with their child during the last year: (a) museums, (b) libraries, (c) kids' concerts, (d) kids' theaters, (e) zoos or wildlife parks. The possible answers were *at least once a week*, *at least once a month*, *several times a year*, *less often*, and *never*. Although exploratory factor analysis yielded only one factor, only the items for museums, kids' concerts, and kids' theaters showed high factor loadings, whereas the items for libraries and zoos had relatively low loadings. Consequently, the three items measuring the *child's highbrow culture* were summed to form one scale (Cronbach's $\alpha = .60$). The scale ranged from 0, indicating no activity at all, to 4, indicating – at least hypothetically – weekly activities in all three domains. The *visits to libraries* item was used as a single-item indicator. The scale ranged again from 0, indicating no activity at all, to 4, indicating weekly library visits. Library visits might be an alternative or a supplement to possessing books and therefore served as an appropriate indicator of cultural mobility. The zoo item was disregarded because it was not linked to the concept of cultural capital.

The *parents' cultural activities* were measured at the third measurement point (end of the fourth grade). The introduction of the measures on cultural participation mentioned whether the interviewee attended cultural events alone or together with his or her child. In the subsequent questions, the parent was asked whether he or she had visited the following events or sites during the last year: (a) an art or historic museum,

(b) an exhibition, (c) a cabaret, theater, ballet, or an opera performance, (d) a classical concert (as well as other concerts and courses unrelated to job/career). For each affirmative answer, he/she reported subsequently how often he/she had attended such places/shows in the last year on an open-ended scale. As the distributions of the answers on these items were highly right skewed, we transformed the scale by first adding 1 to every answer and then taking the natural logarithm. People who did not attend cultural activities at all still received a value 0 after this transformation (as $\ln(1) = 0$). The four items on the *parents' highbrow culture* were summed into one scale (Cronbach's $\alpha = .64$). We should mention that the parents' and child's cultural activities might overlap to some degree. The measure of the child's cultural participation was clearly defined (e.g., child's theater), whereas the introduction of the item block on the parents' cultural participation also mentioned the child. However, the items were targeted to adults to a higher degree (exhibition, opera).

The parent also reported how many hours he/she had *read newspapers* or *books* during the last month. The answers to both questions were only weakly correlated and were therefore used separately in the analyses. Because the reports on hours of reading newspapers or books during the last month were right skewed as was also the case for the number of highbrow activities, we transformed and logarithmized the answers as already described above. We assumed that both the parents' visits to highbrow events and their reading behavior would remain stable over time and would not be influenced by the child's progress in text comprehension and that it would therefore be justifiable to use them as predictors even though they were surveyed at the third measurement point.

Families with at least one parent born abroad were considered to have an *immigration background*. In these cases, we also indicated whether the family reported speaking with the child (a) always in German, (b) mostly in German, (c) in German and another language to the same degree, or (d) mostly in another language/other languages. Each of these categories was coded using binary variables.

The parents' education and cultural activities and habits could also be indicators of the family's economic situation. In order to avoid a confounding influence, we focused on the monthly disposable household income including state transfers. Because income is a sensitive question with a large proportion of item nonresponses and therefore also

might have a reduced reliability, we took the average of all valid pieces of income information collected at the first three survey measurement points. However, in about every tenth case, there was still no income information. Therefore, we applied a regression-based single imputation to fill the gaps. Income was need-adjusted by the square root of the number of persons in a household; due to the positive skew of the distribution, we used the logarithms of the income values.

Student's *gender* was dummy coded 1 for male and 0 for female students.

Finally, we also controlled for *general cognitive abilities* measured at the first measurement point. Students' general cognitive abilities were assessed with a set of 15 items from the matrices subtest of the Culture Fair Intelligence Test (CFT; German version: Weiß, 2006). This test measures the ability to recognize and solve problems of figural relations and of formal figural reasoning with different levels of complexity within a time limit of 3 min. General cognitive abilities have a strong heritable component (Bouchard & McGue, 1981; Plomin & Spinath, 2004), but are not independent of influences from the school (Becker, Lüdtke, Trautwein, Köller, & Baumert, 2012). When controlling for students' general cognitive abilities, we tried to avoid biased parameter estimations due to genetic covariation between students' cognitive abilities and parents' background.

Statistical Methods

As the data consisted of students (i) in school classes (j), we estimated multilevel linear regressions with a random intercept. The dependent variable $Y_{ij,t+1}$ is the reading comprehension of each single student (i) at the end of the fourth grade measured at the third measurement point. As we were interested in reading progress, we controlled for reading comprehension $Y_{ij,t}$ in the third grade measured at the first measurement point. Further covariates were all measured at the individual level. They refer to the student or his/her family. All unobserved characteristics imposing the same influence on test results at both points of measurement were cancelled out by controlling for the results of the first tests. This procedure reduces biased estimations for students' and family's activities and characteristics due to unobserved heterogeneity.

As there could be substantial differences in reading comprehension in Grade 4 between school classes due to factors such as class composition, quality of instruction,

teacher characteristics, and so on, we estimated random intercept models. As variation between school classes was not in our research focus, we did not add any covariates to the second level (j). However, allowing for variation between classes reduces the risk of biased estimations for coefficients and their standard errors at the individual level (cf. Hox, 2002; Nezlek, Schröder-Abé, & Schütz, 2006).

Results

First, some descriptive statistics and correlations are presented. Subsequently, the results of the multivariate analysis are reported.

Descriptive Findings on Reading Comprehension in Grades 3 and 4 and Correlations between Different Indicators of Cultural Capital

In a first step, a short overview of the characteristics of the two subsamples of students (immigrant and non-immigrant students) is provided (see Table 1). Average reading comprehension scores according to the main characteristics at both points of measurement are presented. The values of the variables for parents' education, children's and parents' highbrow visits, parents' reading behavior, and household income were aggregated for this overview.

Table 1. Sample description: average reading comprehension by main characteristics for students without and with an immigration background at the first (Grade 3) and third (Grade 4) measurement point (balanced panel)

Subsample	Native students			Immigrant students		
	M (SD)	*M (SD)*	*n*	*M (SD)*	*M (SD)*	*n*
Grade	3	4		3	4	
total	51.85 (9.97)	63.78 (12.36)	1,218	48.78 (9.18)	61.18 (11.45)	256
parents' years of education						
7 to 10	48.69 (7.60)	57.21 (9.90)	15	47.30 (7.61)	57.21 (12.01)	22
>10 & <13	50.16 (9.32)	61.13 (11.32)	629	46.78 (8.59)	58.74 (9.49)	101
13 to 16	52.72 (9.39)	65.20 (12.31)	273	48.59 (8.92)	60.32 (10.89)	60
>16 (i.d.18)	54.76 (11.11)	68.34 (13.02)	301	52.15 (9.8)	66.45 (12.59)	73
# of books at home						
1 to 10	42.15 (6.82)	51.10 (15.00)	4	44.25 (4.21)	51.45 (8.00)	7
11 to 50	47.53 (7.88)	58.00 (11.02)	84	43.41 (7.93)	56.02 (8.88)	45
51 to 100	49.11 (8.58)	60.86 (11.77)	172	47.62 (7.75)	58.07 (10.44)	47
101 to 250	51.43 (9.24)	62.82 (11.32)	378	49.65 (8.62)	63.08 (10.38)	75
251 to 500	52.73 (10.81)	65.64 (12.56)	332	51.79 (10.13)	62.82 (11.67)	46
> 500	54.85 (10.36)	66.90 (13.04)	248	52.21 (9.76)	67.51 (13.45)	36
child reads for joy						
hardly ever/never	43.83 (7.01)	54.35 (9.37)	130	44.38 (7.03)	53.69 (8.29)	37
less often	47.51 (7.97)	58.96 (10.98)	207	45.49 (8.37)	58.44 (8.71)	50
several times a week	51.34 (8.81)	63.33 (10.48)	322	49.12 (9.18)	60.76 (9.80)	70
every day	55.62 (10.06)	68.01 (12.55)	559	51.84 (9.19)	65.65 (12.85)	99
highbrow part. (child)						
0	49.20 (8.05)	59.63 (11.17)	113	48.81 (9.33)	58.49 (8.57)	47
>0 to 1	51.37 (10.01)	63.01 (12.07)	666	47.55 (8.92)	59.98 (11.17)	132
>1 to 2	53.30 (10.17)	65.96 (12.45)	422	50.31 (9.13)	64.23 (12.12)	66
>2	52.23 (10.66)	67.13 (17.91)	17	54.16 (9.87)	68.72 (15.52)	11
child's library use						
never	50.58 (9.63)	61.88 (12.03)	395	47.61 (8.78)	59.21 (9.75)	87
less often	50.45 (9.13)	62.83 (11.58)	143	49.15 (9.44)	63.22 (13.27)	27
several times a year	51.62 (9.46)	63.54 (12.77)	213	48.91 (10.53)	59.73 (12.66)	47
at least once a month	52.93 (10.80)	64.93 (12.21)	334	49.84 (8.76)	64.10 (11.34)	69
at least once a weak	54.81 (9.69)	67.93 (12.70)	133	49.26 (8.97)	60.51 (11.68)	26
highbrow part. (parent) (p.a.)						
0	49.36 (8.14)	60.58 (11.31)	189	47.10 (8.13)	56.58 (9.44)	66
>0 to 1	51.35 (9.74)	62.74 (11.88)	687	48.55 (9.75)	61.82 (11.39)	128
>1 to 2	54.46 (10.87)	67.44 (13.26)	238	49.55 (8.25)	63.27 (11.46)	41
>2	53.76 (10.91)	68.04 (12.26)	104	53.91 (9.00)	67.63 (13.10)	21
reading newspaper (parent) (hours/month)						
0	51.20 (10.08)	62.93 (10.86)	90	47.85 (7.01)	58.52 (9.88)	30
>0 to 7.5	51.56 (9.63)	63.69 (11.98)	400	50.52 (9.64)	62.44 (11.24)	78
>7.5 to 15	52.42 (10.24)	64.26 (12.81)	556	48.12 (9.38)	61.43 (11.6)	98
>15	51.02 (9.80)	62.87 (12.50)	172	47.90 (9.07)	60.30 (12.36)	50
reading books (parent) (hours/month)						
0	50.19 (8.89)	61.30 (11.73)	306	47.40 (8.12)	60.04 (11.87)	81
>0 to 7.5	52.02 (10.4)	64.56 (11.89)	210	49.01 (10.46)	61.51 (11.47)	40
>7.5 to 15	53.20 (10.63)	64.97 (13.38)	347	50.89 (9.68)	63.44 (11.85)	62
>15	51.87 (9.78)	64.28 (11.85)	355	48.38 (8.97)	60.33 (10.54)	73

immigration background + language use						
mostly non-German				48.09 (8.70)	60.08 (12.48)	30
German as often as others				49.12 (9.99)	60.61 (11.05)	47
mostly German				47.21 (9.32)	60.54 (12.38)	82
only German				50.15 (8.7)	62.32 (10.55)	97
natives	51.85 (9.97)	63.78 (12.36)	1,218			
household income						
1 (lowest quintile)	49.19 (8.63)	61.02 (11.16)	241	46.94 (8.29)	58.48 (10.29)	82
2	50.80 (10.13)	61.48 (12.23)	246	46.95 (11.13)	59.74 (10.30)	47
3	52.76 (9.39)	64.99 (11.53)	250	48.46 (7.57)	62.22 (11.46)	52
4	53.20 (10.12)	65.34 (12.55)	228	50.54 (7.95)	60.74 (11.90)	34
5 (highest quintile)	53.31 (10.86)	66.03 (13.37)	253	53.50 (9.69)	67.26 (12.60)	41
gender						
female	52.61 (9.85)	65.85 (12.14)	585	49.44 (9.85)	63.29 (11.78)	121
male	51.15 (10.04)	61.86 (12.26)	633	48.19 (8.53)	59.28 (10.85)	135

Source: BiKS 8-14, measurement points 1 to 3, our own calculations.

In total, 256 students (17.4%) had immigration backgrounds, and 1,218 students (82.6%) in the sample were natives. On average, both groups made substantial progress in reading comprehension over time, but students from immigrant families scored lower on reading comprehension in comparison to native students at both measurement occasions. For parental education and the number of books in the household, the results provided a clear picture: The higher the parents' formal qualifications or the more books available in the home, the higher the average reading comprehension scores of students from both groups and at both measurement points. A similar pattern was observed for the children's amount of time spent reading and children's attendance of highbrow performances. A different pattern, however, was found concerning the frequency of joint library visits: Whereas mean reading comprehension scores steadily increased with the frequency of joint library visits for native students, such a clear pattern was not found for students with immigration backgrounds.

Regarding parents' activities, a trend toward increasing reading comprehension scores with increasing parental highbrow cultural activities was found for both immigrant and non-immigrant students. However, the relation between the amount of time parents spent reading newspapers or books and students' reading comprehension was nonlinear. In most cases, children had the highest results if parents read newspapers or books 7.5 to 15 hours a month (equivalent to 15 to 30 min per day). If parents

indicated reading more or less, children fared less well in most cases. For students with at least one parent born abroad, we also display the average reading comprehension and the proportion of German language use in the family. There was no clear pattern for this family indicator. The higher the disposable household income, the higher the average reading comprehension scores within both subsamples (immigrant and non-immigrant students). And finally, the average reading comprehension scores differed between boys and girls: Girls outperformed boys independent of immigration status.

The correlations between the different indicators of cultural capital are presented in Table 2. The correlations were calculated separately for each immigration status. Correlations for natives are below the diagonal, and correlations for children of immigrants are above the diagonal. The strongest correlations were found between parental education and the number of books in the household (.53 and .57) as well as between the child's and the parents' visits of highbrow cultural events (.57 and .54). Note that in the case of highbrow culture, the constructs might not be distinct, i.e., they might overlap (cf. discussion in the data and method sections). Furthermore, in both native and immigrant families, there were additional considerable correlations between the parents' education level, the number of books in the household, the students' and parents' cultural participation, and the parents' amount of time reading books. All other correlations were below .30.

Table 2. Correlations between different types of cultural resources and activities for natives (below diagonal) and families with an immigration background (above diagonal)

			1	2	3	4	5	6	7	8
1		parents' years of education	1	.57	.10	.32	.20	.45	.14	.33
2		# of books at home	.53	1	.25	.31	.09	.44	.15	.32
3	child	reads	.19	.19	1	.28	.23	.27	-.01	.08
4	child	highbrow participation	.36	.37	.18	1	.29	.54	.14	.18
5	child	library	.12	.11	.16	.22	1	.24	.09	.18
6	parent	highbrow participation (ln)	.39	.44	.18	.57	.18	1	.25	.22
7	parent	newspapers (ln)	.09	.10	.02	.07	.06	.12	1	.11
8	parent	books(ln)	.21	.32	.10	.19	.14	.21	.14	1

Source: BiKS 8-14, measurement points 1 and 3, natives: n = 1,218, immigrants: n = 256; our own calculations.

Taken together, the large number of small correlations between the different indicators suggests that the indicators capture different aspects of cultural capital in the family and that parents as well as children show substantial differences in their amount of cultural capital.

Multivariate Analysis on the Importance of Cultural Capital for Progress in Reading Comprehension

This section contains the results of the multivariate models predicting students' reading comprehension at the end of Grade 4. First, we estimated all models separately for students with and without immigration backgrounds (see Table 3). In a first step, we included only the variables parents' education and number of books in the household, which are common indicators of cultural capital in educational research. In a second step, we introduced the control variables disposable household income, general cognitive ability, and gender. In a third step, we controlled for previous reading comprehension measured in the third grade. This means we shifted from purely cross-sectional to value-added models, controlling for unobserved heterogeneity to a much greater extent. Finally, the last column displays a model restricted to students with at least one parent born abroad. This model was extended by the share of German language use in the family (Model M4i).

Table 3. The importance of parents' education and number of books for reading comprehension at the end of the fourth grade in native and immigrant families; results of random-intercept models

	Natives M1n *b/(SE)*	Immigr. M1i *b/(SE)*	Natives M2n *b/(SE)*	Immigr. M2i *b/(SE)*	Natives M3n *b/(SE)*	Immigr. M3i *b/(SE)*	Immigr. M4i *b/(SE)*
parents' years of education	0.91**	0.55*	0.85**	0.40	0.52**	0.28	0.25
	(0.14)	(0.25)	(0.14)	(0.25)	(0.10)	(0.19)	(0.19)
# of books at home	1.10**	2.09**	0.88**	1.55*	0.07	0.45	0.45
	(0.34)	(0.60)	(0.33)	(0.61)	(0.24)	(0.47)	(0.48)
household income (ln)			0.27	1.82	-0.53	0.59	0.64
			(0.90)	(1.53)	(0.64)	(1.16)	(1.22)
cognitive ability			0.80**	1.22**	0.12	0.41+	0.41+
			(0.14)	(0.29)	(0.10)	(0.23)	(0.23)
boy (girl)			-3.82**	-3.32**	-2.71**	-2.78**	-2.83**
			(0.66)	(1.29)	(0.47)	(0.98)	(0.99)
reading comprehension (in the third grade)					0.86**	0.80**	0.80**
					(0.02)	(0.06)	(0.06)
language use (only German)							
mostly German							0.76
							(1.22)
~50/50							-0.14
							(1.44)
mostly non-German							0.24
							(1.71)
constant	46.49**	45.66**	41.40**	27.63*	16.58**	10.42	9.83
	(1.72)	(2.91)	(6.39)	(11.00)	(4.61)	(8.43)	(9.03)
variance							
class level	2.85	0.00	2.13	3.47	4.04	0.00	0.00
individual level	134.61	113.13	127.73	96.76	64.14	58.31	58.09
rho	0.02	0.00	0.02	0.03	0.06	0.00	0.00

Source: BiKS 8-14, measurement points 1 to 3, our own calculations.
Case numbers: 1,218 native students out of 149 school classes, 256 students of immigrant families out of 113 school classes.
Notes. Reference categories in italics; significance levels: $^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq .01$.

In the first models, M1n and M1i, positive and significant coefficients were estimated for parents' education as well as the number of books in the household. As in the descriptive statistics depicted in Table 1, higher formal education and more books in the household were related to higher test results for both immigrant and native students. Including the control variables in the second set of models, M2n and M2i, led to a reduction in the size of the coefficients for parental education and number of books in the household. In the case of students with a least one parent born abroad,

the coefficient for parental education failed to reach significance.[2] In the third set of models, M3n and M3i, the analysis shifted to a focus on the differential progress in reading comprehension as students' reading comprehension in Grade 3 was added as a covariate. In this model, parents' education level remained a significant predictor of reading comprehension development within the subsample of native students but not within the subsample of students with an immigration background. In addition, the number of books in the household did not make any difference in the growth of reading comprehension in both subsamples. Regarding language use in immigrant families, model M4i did not show different progress in reading comprehension in relation to the amount of German language use in the family.

Models M3n and M3i served as references for the next set of analyses. Each model was expanded by only one indicator. We began with the indicators of the mobility approach, namely, children's activities, and then added indicators of the social reproduction approach, parental activities (see Table 4). All effects were estimated under the control of parents' education, number of books, household income, students' general cognitive abilities, previous reading achievement, and gender. In both subsamples, there was a significant positive relation between students' amount of reading and the development of reading comprehension. Regarding students' highbrow cultural activities, the coefficients in both subsamples were positive (more activities led to higher growth), although only the coefficient estimated for the immigrant subsample was significant. The coefficient for students' highbrow cultural activities in the native subsample did not reach statistical significance. Students' frequency of library visits was not related to the development of reading comprehension. For the parents' frequency of visiting highbrow events, positive effects of the development of reading comprehension were estimated. In the native subsample, the effect was significant at the 10% level and in the immigrant subsample, at the 5% level. Therefore, the amount of parents' cultural activities was positively linked to students' development of reading comprehension. However, the coefficient estimated for the immigrant subsample was nearly three times as large as the estimated coefficient for the native subsample. Parental reading behavior was not linked to students' growth in reading comprehension as the

[2] Interestingly, the coefficients for household income were not significant. Financial resources seem to be unrelated to reading comprehension.

estimated coefficients did not reach significance at the 5% level. In the immigrant subsample, one negative coefficient for parents' amount of book reading was found. This coefficient was significant at the 10% level.

Table 4. Effects of cultural participation and activities on progress in reading achievement in native and immigrant families – enlargement of models M3n and M3i by one variable[1]

	child			parent		
	reads (0-3)	highbrow part. (0-3)	uses library (0-4)	highbrow part. (ln)	reads news-paper (ln)	reads books (ln)
Natives						
Coeff.	0.82**	0.49	0.23	1.23^{+}	-0.02	0.01
SE	(0.25)	(0.45)	(0.17)	(0.65)	(0.03)	(0.02)
Immigrants						
Coeff.	1.33**	1.94**	0.14	3.46*	0.01	-0.05^{+}
SE	(0.49)	(0.73)	(0.36)	(1.36)	(0.05)	(0.03)

[1] All models include variables on parents' education, number of books, household income, students' general cognitive abilities, previous reading achievement, and gender, see Table 3.
Source: BiKS 8-14, measurement points 1 to 3, our own calculations.
Case numbers: 1,218 native students out of 149 school classes, 256 students of immigrant families out of 113 school classes.
Notes: Reference categories in italics; significance levels: $^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq 0.01$.

Taken together, both students' frequency of library visits and parents' reading behavior did not promote progress in reading comprehension. The student's own reading behavior, however, positively influenced growth in reading comprehension. Students' and parents' attendance of highbrow events also seemed to have an impact on reading progress; this effect was especially pronounced for students raised in immigrant families. Remember, according to Table 3, parents' formal qualifications seemed to have lower or even no influence in immigrant families. These findings strongly suggest that the importance of cultural capital differs between native and immigrant families. However, the two subsamples differed considerably in sample size, and the standard errors of the point estimates were only considered superficially. In addition, a few effects might be spurious and might disappear after controlling for other forms of cultural capital.

Finally, models comprising both subsamples were estimated. Immigration status was included in the models as a predictor variable. The models depicted in Table 5

included all variables already used in models M3n and M3i (see Table 3) plus a binary variable indicating students' immigration status. Furthermore, variables with significant coefficients in Table 4 were added to the model. These variables consisted of students' time spent reading as well as the students' and parents' amount of participation in highbrow events. For all of these variables, main effects were estimated and displayed in Model 5 (Table 5). The next three models included an additional interaction term between immigration background and parental education (Model 6) as well as the students' or the parents' amount of participation in highbrow events (Models 7 and 8, respectively). In the last model (Model 9), all three interaction terms were included simultaneously.

Table 5. The importance of cultural capital and immigration background for reading comprehension at the end of the fourth grade – value-added models with random intercepts

	M 5 *b/(SE)*	M 6 *b/(SE)*	M 7 *b/(SE)*	M 8 *b/(SE)*	M 9 *b/(SE)*
Immigration background (native)	0.10 (0.57)	1.12 (2.45)	-0.95 (0.93)	-0.60 (0.85)	1.62 (2.50)
parents' years of education	0.41** (0.09)	0.43** (0.10)	0.41** (0.09)	0.41** (0.09)	0.46** (0.10)
Interaction term with immig.		-0.07 (0.17)			-0.23 (0.20)
# of books at home	-0.11 (0.22)	-0.11 (0.22)	-0.11 (0.22)	-0.11 (0.22)	-0.10 (0.22)
child reads for joy	0.86** (0.23)	0.85** (0.23)	0.84** (0.23)	0.85** (0.23)	0.83** (0.23)
highbrow part. (child)	0.35 (0.43)	0.35 (0.43)	0.04 (0.48)	0.33 (0.43)	0.04 (0.50)
Interaction term with immig.			1.19 (0.82)		1.11 (0.98)
highbrow part. (parent)	1.16+ (0.66)	1.17+ (0.66)	1.22+ (0.66)	0.92 (0.69)	1.02 (0.72)
Interaction term with immig.				1.52 (1.35)	1.30 (1.70)
household income (ln)	-0.37 (0.56)	-0.38 (0.56)	-0.35 (0.56)	-0.37 (0.56)	-0.38 (0.56)
cognitive ability	0.16+ (0.09)	0.17+ (0.09)	0.16+ (0.09)	0.16+ (0.09)	0.16+ (0.09)
boy (girl)	-2.43** (0.43)	-2.43** (0.43)	-2.45** (0.43)	-2.44** (0.43)	-2.46** (0.43)
reading comprehension (at 3rd grade)	0.82** (0.02)	0.82** (0.02)	0.82** (0.02)	0.82** (0.02)	0.82** (0.02)
constant	16.40** (4.08)	16.25** (4.10)	16.52** (4.08)	16.63** (4.09)	16.23** (4.10)
variance					
class level	1.22	1.08	1.13	1.19	1.12
individual level	62.88	62.88	62.88	62.89	62.84
rho	0.02	0.02	0.02	0.02	0.02

Source: BiKS 8-14, measurement points 1 to 3, our own calculations.
Case numbers: 1,474 students out of 153 classes.
Notes. Reference categories in italics; significance levels: $^{+}$ $p \leq .10$, * $p \leq .05$, ** $p \leq .01$.

Model 5 did not show any overall differences in the growth of reading comprehension between students of native and immigrant families. There was again a positive highly significant effect of the child's amount of time spent reading on the progress in reading comprehension. Regarding highbrow activities, the main effect of parents' activities was significant at the 10% level, whereas the main effect of students' highbrow activities failed to reach significance. However, both indicators were highly correlated (see Table 2). Therefore, if we included only one of these two indicators,

parents' activities were significant at the 5% level and children's activities at the 10% level (results are not shown in the table). Consequently, it seems that parents' highbrow cultural activities have a stronger impact on students' reading comprehension than students' own cultural engagement.

Regarding the interaction effects in Models 6 through 9, all of them pointed in the direction suggested by the previously estimated models, but none of the interaction effects was statistically significant. In addition, the comparison of the remaining unexplained variance on the individual level in Model 9 with the individual variance in Model 5 revealed that the interaction terms did not reduce the unexplained variance at the student level. Therefore, the spare Model 5 should be preferred to Model 9, which contained three additional interaction terms. Consequently, the results of the joint analytic model did not provide support for immigrant-specific differences in the importance of cultural capital for progress in reading comprehension at the end of primary school.

Conclusions

At the end of the theoretical introduction on the importance of cultural capital, we posed three main research questions. In the following section, we will discuss every research question separately with regard to the presented results.

The first research question of this study concerned the contributions of different forms of cultural capital to the student's reading comprehension. In order to gain insight into this topic, we decided to investigate progress in reading comprehension instead of merely analyzing reading comprehension at a single point in time. The focus on explaining differences in progress reduces the threat of biased estimations and the problem of reversed causation. For example, students who like reading a lot might do so because they are excellent readers and reading is easy for them. The advantage of value-added models can also have some drawbacks as previous positive influences on the status achieved at the first measurement point cannot be discovered. Consequently, results are conservative (i.e., we might have underestimated the influence of relevant factors). In addition, our empirical analyses still relied on nonexperimental data.

Unobserved factors with time-varying influences might be correlated with our variables and therefore might bias the estimated effects.

Our empirical analyses on the development of reading comprehension from the middle of the third grade to the end of the fourth grade indicate that students perform better over time the higher their parents' educational level is and the more time the students themselves spend reading. There is also evidence that participation in highbrow culture promotes growth in reading comprehension, especially the parents' participation in such activities. No effects could be found for the number of books in the household or children's use of libraries. The number of books is an indicator of the opportunity structure. Library visits are also an indicator of the opportunity structure, but might also be an indicator of interest in reading. In addition, parental reading time was not related to the child's competence gains, even if we did not control for the child's own reading time.

How should these findings be interpreted? First, inequalities in reading comprehension increased between children raised in families with lower and higher educational backgrounds during the last year of primary school. Second, this widening gap could not be fully explained by the reading habits or cultural activities of the students or their parents. This means that relevant indicators for explaining the widening gap were missing from our analyses. Third, the student's amount of reading had a positive impact on progress in reading comprehension, but the parents' amount of reading did not. Furthermore, the student's and parents' amount of time spent reading were not substantially correlated with each other. These findings call for a cautious view of simple models that assume that parental reading behavior serves as a role model and is simply reproduced by the students. The findings also raise concerns about the fact that parental reading as such produces a more stimulating literacy environment for the child (e.g., different vocabulary, more complex grammar). However, the available indicators differentiated only between reading newspapers and reading books. Nevertheless, there was no indication of the quality of this reading material, limiting the explanatory power of this finding. This leads directly to the fourth point: the attendance of highbrow cultural events (e.g., theater, classical concerts, etc.). Parents' and students' frequency of engagement in these activities were strongly correlated with each other. This seems quite plausible as the students under

investigation were of primary school age, and these activities should be highly influenced by parents' contributions to students' leisure time activities. In addition, the parents' participation in beaux arts exerted a stronger influence on the student's progress in reading comprehension than on the student's own participation in beaux arts. In contrast to the indicators of the parents' reading behavior, the participation in highbrow culture was more clearly related to cognitively demanding activities. These activities seem to enhance competencies in the language domain. However, such activities might also be based on some third variables such as higher parental skills and cognitive capacities, which could also lead to a more stimulating home environment for the student. Therefore, we should be careful about making causal interpretations of these finding.

The second research question referred to differences in the impact of cultural capital on reading comprehension between native and immigrant students. With regard to the existent literature (e.g., Nauck, Diefenbach, & Petri, 1998), we expected stronger relations between measures of cultural capital and academic achievement for native students than for students with immigration backgrounds. This expectation was partially confirmed. Whereas parental education background was significantly related to the development of reading comprehension in the subsample of native students, no such relation was found in the subsample of students with an immigration background (Models M3n and M3i, Table 3). Therefore, it seems that cultural capital in terms of educational level acquired in a foreign country is not as easily transferred to the next generation as the same type of cultural capital acquired in the host country by native parents. However, in a joint model, the interaction term of the educational background of the parents and immigration status did not reach significance (Model M9, Table 5). Therefore, the result of different influences of the educational background of the parents with and without an immigration background on the development of reading comprehension should be interpreted with caution. With regard to cultural activities, the opposite seems true: Participation in highbrow cultural activities was more highly related to reading comprehension for students from immigrant families than for students from native families (cf. Table 4). The tested interaction effects in the joint model, however, also did not confirm these findings from the separate analyses for students with and without an immigration background.

Therefore, although only of preliminary status, we might conclude that some forms of cultural capital, especially more distal aspects such as the parents' educational background, are of higher importance for students from native families than for students with an immigration background. Behavioral aspects such as the participation in highbrow cultural activities within the host country, however, seem at least equally influential for the educational attainment of both groups – immigrant students as well as native students. This is consistent with our expectations: Cultural capital in terms of parents' level of education that was acquired in a foreign country is often less directly transferable into students' educational success in another country. Participation in highbrow cultural activities, however, at least as these activities were measured in the BiKS-8-14 study, takes place in the host county and therefore can be more directly converted into the educational success of the students. Finally, a specific feature of the immigrant families in this study was that the majority indicated that they do not use the receiving country's language (German) at home. However, we might consider the use of German language itself as a specific aspect of cultural capital. According to our analysis, there was no difference in the progress in reading comprehension with regard to the amount of German language use in the family (Model M4i, Table 3). This was contrary to our expectations, as the language spoken in the family has been shown to be a relevant predictor of academic achievement, including students' reading competence level (Müller & Stanat, 2006; Stanat & Edele, 2011).

Finally, with the third research question, we asked whether results from the BiKS-8-14 longitudinal study were consistent with the model of social reproduction (cf. Bourdieu, 1974; Bourdieu & Passeron, 1977) or whether our results could provide support for a model of social mobility (cf. DiMaggio, 1982; DiMaggio & Mohr, 1985). The findings on activities of highbrow culture may be interpreted in favor of social reproduction theory in the tradition of Bourdieu. The parents' and children's highbrow cultural activities were highly correlated and the parents' highbrow cultural activities imposed a stronger influence on the progress in reading comprehension. The impact of the parents' formal qualifications on progress in reading comprehension could also be credited toward the theory of social reproduction. However, the strong influence of reading habits, independent of the parents' cultural activities and educational level, counts toward cultural mobility in a broader sense. In a strict sense, in the version

offered by DiMaggio and Mohr, cultural mobility is mainly a signal that results in better grading or access to information. In the extended version that we favor, cultural mobility also offers the opportunity for students from lower social classes to adopt the values, knowledge, and skills of the dominant social classes, including academic achievement.

Nevertheless, it should also be kept in mind that our findings are affected by some methodological and conceptual limitations. First, some covariates included in the multilevel linear regression models (e.g., the number of books in the home or the student's reported reading behavior), were not measured on an interval scale level. However, for the ease of model specification and interpretation, we assumed a linear relation between these covariates and reading comprehension. Second, our data were affected by a substantial amount of missing data and sample attrition. Therefore, our results could be biased if the data were not missing at random. Finally, we should be careful about assigning causal status to the reported effects. As only observational data were used, we are unable to exclude the existence of further unobserved or disregarded variables that might explain the relations we found between parents' cultural capital and students' reading achievement. Therefore, further research is needed to explain the mechanisms of social reproduction and mobility as well as differences in these mechanisms between students of different ethnic-cultural backgrounds.

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