

THE CULTURAL CAPITAL OF IMMIGRANT FAMILIES AND THE IMPACT ON STUDENT PERFORMANCE: EVIDENCE FROM GERMANY

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Abstract

The aim of this paper is twofold. It intends to examine to what extent the school performance of immigrant students depends on their cultural background as well as to explain the link between the intergenerational transfer of cultural capital and the educational achievement. Using PISA data 2003 for Germany we examine the validity of cultural reproduction and cultural mobility theories in the case of immigrant students. We show that the education of parents has a higher positive impact on the student performance only in the case of German students. Parental education has no effect on school achievement of immigrants, unless the mother has a low level of education. The educational resources influence to a greater extent the school performance of immigrants. The possession of cultural resources is a strong predictor for educational achievement only for German students.

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1. Introduction

The cultural capital of an individual exerts a significant influence on its economic behaviour. The formation of expectations and preferences, the attitudes towards risk, the economic policy decisions depend strongly on the cultural background of the individual (Guiso, Sapienza and Zingales, 2006). Therefore, between the economic and cultural capital there is a very strong correlation.

The first "market" for the cultural capital is the education system. Through the educational success or failure the cultural capital is valued and can be used for the acquisition of other forms of capital. The assessment of the cultural capital starts thus already at school. The acquisition of cultural resources begins however earlier, within the family. They represent the first investment in the life of an individual and are later required in order to achieve the expected return on education, namely the school and then the economic success. The family environment has thus a great influence on the development of children. The education of parents, the economic and cultural resources of the family have a significant impact on the learning abilities of children.

Which impact has the cultural capital within the immigrant families? Has the cultural capital of the immigrants the same function as the cultural capital of the locals? The results of PISA studies suggest that the disparities in performance skills that exist between immigrants and natives are due to the unequal availability of social and

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cultural home resources. Since the cultural capital has a higher intergenerational mobility function, these differences are transferred from one generation to the next.

The aim of this paper is twofold. It intends to examine to what extent the school performance of immigrant students depends on their cultural background as well as to explain the link between the intergenerational transfer of cultural capital and the educational achievement. Using PISA data 2003 for Germany we examine the validity of cultural reproduction and cultural mobility theories in the case of immigrant students.

The reminder of the paper is the following: the next section provides a theoretical overview of the intergenerational transfer of cultural capital and describe the main models of the transmission of cultural capital between generations. The third section discusses the cultural capital in the context of migration. Section 4 describes the PISA data 2003 used in this paper and discusses the estimation results. The last section concludes.

2.The intergenerational transfer of cultural capital

The school is the first and most important institution in the life of an individual, where the cultural capital is valued. In this context of the education system, the concept of "capital" can be better explained. Since the cultural capital is highly correlated to the social status of the family, the educational system not only assesses the cultural capital, but also various aspects of social status, which are thereby legitimated or sanctioned. As part of the *habitus* of the parents' house, the cultural capital reflects therefore the main characteristics of the family background. In other words, the differences in endowment with cultural capital and the hierarchies in the social status also affect the school performance an individual.

The relationship between cultural capital, social status and education has already been assessed in the literature. The empirical findings are mainly based on two models: the model of social reproduction and the model of cultural mobility. Based on these two models hypotheses are set up in order to describe the impact of the cultural capital, as a function of social background, on the school achievement. The two models are presented and tested below.

The model of cultural reproduction

The model of cultural and social reproduction was formulated by Bourdieu and Passeron (1971) in order to explain the social inequality within an education system.

The theory of social reproduction assumes a strong correlation between the social status of parents, their cultural capital and the capital of their children. Thus, the differences in social status are detectable only by comparing the endowments with cultural capital. Bourdieu (1973) emphasizes in this context that these social inequalities are reflected by the educational system, being generated by the fact the fact that the children of the so-called "dominant classes" have significant advantages compared to children from families with low social status, because they have more cultural capital, which is necessary to facilitate the access to the education system. Since the children's cultural capital reproduce those of their parents (Aschaffenburg and Maas, 1997) and because "the schools are active agents of social reproduction"

(Kingston, 2001), the education of children is correlated to the social status of the family. Thus the higher one's social status is the better one's endowment of cultural capital, which has a positive effect on the school achievement.

Why is the cultural capital of parents so important for the educational success of their children? Following the model of cultural reproduction, the cultural capital of parents is completely transferred to their children. Thus, each child possesses at the beginning of the school a certain quantity of cultural capital which is necessary at school in order to acquire educational capital. The school is therefore a part of the dominant culture, where the cultural preferences and skills are rewarded.

The model of cultural mobility

Using U.S. data, Paul DiMaggio (1982) provides an alternative to the theory of cultural reproduction. Just as in Bourdieu's model, the cultural capital (defined here as the involvement in art, music and literature activities) have a significant influence on the academic results, but the correlations between the social status of parents, the cultural capital of parents and their children are low. Aschaffenburg and Maas (1997) have even indicated that the effects of social status and cultural capital on the educational skills are independently and that the cultural capital is not necessarily a characteristic of the upper classes.

The theory of cultural mobility was also demonstrated empirically. De Graaf, De Graaf and Kraaykamp (2000) find for the case of Netherlands that the interaction between the socioeconomic background and the cultural capital of parents is negative, so that children from families with low socioeconomic status can benefit from the cultural capital of their parents, when this is available. Investigating the theory of cultural mobility in the case of the Netherlands, the authors show that the children with a low socioeconomic background benefit more from the cultural capital of their parents as the children from families with a higher status. Furthermore, compared to the theory of cultural reproduction, the cultural capital of the parents is not fully transferred to the children. Therefore, the access to cultural capital is also possible for children from lower classes and the effects of the cultural capital on the school achievement are comparable for all children, regardless their socioeconomic background.

3. The cultural capital in the context of migration

The cultural capital has in the context of migration specific features. In order to analyse its impact, the cultural capital of immigrants should be considered in relation to the cultural capital of the host country. The inevitable interaction between cultures implies, however, not only an interaction with the culture of the host country, but also with other ethnic cultures, which are to be found in the host country. In this context, one's own cultural capital could have a negative or a positive impact. Given these special characteristics, it is obvious that the cultural capital of the immigrants cannot be defined as one of the locals. It is expected that also the impact of the cultural capital of immigrants and natives is different.

Due to the special characteristics of the cultural capital of immigrants, different variables are used in the literature to define the cultural capital in the context of migration. While the usual definitions of cultural capital make a clear distinction

between the socioeconomic status and the cultural capital, in the case of migration, these two concepts have many similarities. The three main indicators that are mostly used in the literature to define the socioeconomic status are: the income, the education and parents' job. In the context of migration, the education and parents' job represent two indicators, which are used not only to define the socioeconomic status, but also the cultural capital of immigrants (see Nauck et al. 1998, Esser 2006).

While for the natives the dominant interpretation of cultural capital has prevailed (Lareau and Weininger, 2004), for the immigrants the cultural capital in terms of cognitive skills is most relevant. Since the ethnic groups have less cultural capital from the host country, indicators, such as participation in cultural life, the aesthetic and cultural dispositions towards the dominant culture plays for the immigrants a less important role. These indicators cannot be used to measure the cultural capital of immigrants. For this reason, we can argue that the cognitive abilities of immigrants are used instead to compensate the lack of cultural capital of immigrants from the host country. Based on these considerations, we will use in the following the education and the socioeconomic status as indicators in order to define the cultural capital in the context of migration.

2. Data and estimated results

The following analysis is based on PISA data for Germany from 2003. PISA (Program for International Student Assessment) examines the performance of fifteen-year-old youth in the areas of mathematics, reading and science. Besides the test scores, PISA contains data on social and cultural background of the students as well as information about the school environment (OECD, 2006). For comparison reasons the scores have been standardized to a mean of 500 and a standard deviation of 100.

Our sample includes 4040 students. It will be taken into account only the information for which full data are available. The test scores represent the dependent variable. The explanatory variables relate mainly to indicators that operationalize the cultural capital and the socioeconomic status. Other control variables refer to age, gender and grade.

Building on the theoretical considerations, we use the following variables to define the cultural capital: the parents' education, the language spoken at home, the possession of cultural goods and of educational resources as well as the number of books in the household.

The PISA study allows us to differentiate between the first and second generation of immigrant children (OECD, 2006). The first generation includes students who are born abroad and immigrated with their parents. The children from the second generation are born in Germany, but the parents are born abroad and immigrated in the test country. Compared to the PISA study that assigns the children with at least one parent born in Germany to the natives, we differentiate in this paper between natives with and without migration background. If only one parent was born in Germany, then we speak about native families with a migration background. We consider the category "native families without a migration background", if both parents were born in Germany.

Table 1 presents the description of the most important variables used in this study.

Table 1: Description of the most important variables

		Weighted means	
		Natives (with and without migration background)	Immigrants
Reading score		518.68	428.65
Math score		527.43	446.92
Science score		531.02	433.58
Mother's education (Dummy variable)	no secondary education	0.01	0.47
	lower secondary education	0.14	0.18
	upper secondary education	0.69	0.22
	tertiary education	0.16	0.13
Father's education (Dummy variable)	no secondary education	0.01	0.42
	lower secondary education	0.09	0.18
	upper secondary education	0.67	0.29
	tertiary education	0.22	0.12
Index of cultural possessions		0.06	-0.17
Index of home educational resources		0.36	0.13
Number of books	Category 1: 0-10 books	0.04	0.17
	Category 2: 11-25 books	0.11	0.24
	Category 3: 26-100 books	0.29	0.34
	Category 4: 101-200 books	0.22	0.14
	Category 5: more than 200 books	0.20	0.07
	Category 6: more than 500 books	0.14	0.04

Source: PISA data 2003

The estimated results

To determine the influence of student background and cultural resources on student's school performance, we perform our analysis using the following education production function:

$$T_i = \beta_0 + \beta_1 \text{Male}_i + \beta_2 \text{Age}_i + \beta_3 \text{Grade}_i + \beta_4 \text{Education}_i + \beta_5 \text{Lang}_i + \beta_6 \text{Cultural_Goods}_i + \beta_7 \text{Re_sources}_i + \beta_8 \text{Books}_i + \varepsilon_i \text{ where } T_i \text{ is}$$

the test score of student i , Male_i is a dummy for the boys, Age_i stands for student age in month, Grade_i comprises grade level dummies, Education_i is a set of

dummies for parental education, *Lang_i* a dummy for students speaking German at home, *Cultural goods_i* stands for the cultural possession index, *Resources_i* for the home educational resources and *Books_i* is a set of dummies for the number of books at home. ε_i is an error term.

We start our investigation by estimating the impact of parents’ education on the test scores (Table 2).

Table 2: The effects of parents’ education on test scores

	Reading		Math		Science	
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
Mother’s education (Reference: tertiary education)						
no sec. educ.	-32.58*** (11.81)	-48.30*** (18.00)	-32.05*** (12.09)	-45.45*** (17.23)	-31.64** (12.50)	-57.02*** (8.88)
lower sec. educ.	-34.62*** (5.48)	-47.72** (19.61)	-29.10*** (5.61)	-45.10 (18.76)	-42.23*** (5.80)	-48.82** (17.97)
upper sec. educ.	-15.25*** (3.94)	-11.58 (16.84)	-12.12*** (4.03)	-16.11 (16.12)	-18.03*** (4.17)	-14.61 (19.57)
Father’s education (Reference: tertiary education)						
no sec. educ.	-65.68*** (11.17)	-4.15 (18.76)	-67.66*** (11.43)	-7.71 (17.95)	-78.45*** (11.82)	-11.01 (16.81)
lower sec. educ.	-62.15*** (5.72)	-16.31 (20.16)	-67.95*** (5.86)	-20.26 (19.30)	-78.09*** (5.06)	-42.16** (18.73)
upper sec. educ.	-30.04*** (3.53)	-15.46 (16.49)	-33.96*** (3.62)	-16.87 (15.79)	-42.85*** (3.74)	-30.74* (16.47)
Observations	3062	389	3062	389	3062	389
R^2	0.29	0.32	0.28	0.32	0.28	0.31

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA scores. Also controlled for but not shown here: gender, age, grade.

Table 2 shows that the parental education has a high impact on student performance, especially for German students, where the father’s education is marginally highly correlated with students’ scores than mother’s education. The higher the educational levels of parents, the better score the students in all three areas of competence. Native students, whose fathers do not even completed secondary education, score, on average, 65 points lower in reading proficiency and 78 points lower in science proficiency compared to students whose parents have completed tertiary education (holding all other influences constant).

However, the parents’ education of immigrants has a lower impact on student performance compared to native students. Father’s education in case of immigrants has no significant effect on student performance, except for science. A lower level of mother’ education is highly significant for all students but has a higher negative impact on student performance in case of immigrants.

Nevertheless, the impact of father’s education for the students, who have at least one German parent, is not only significant but even greater than the influence of

mother's education. The students, whose father has only a secondary education level, score, on average, 30 points lower in reading and 43 points lower in science than the students with higher educated fathers. A higher secondary education of the mother has instead a less negative effect on the test scores. The students achieve, on average, 15 points less in reading and 18 points less in science than students whose mothers have tertiary education. For the immigrant children, instead, it does not matter whether the mothers are better educated or not.

The intergenerational transmission of cultural capital

Based on the theoretical models described before, we estimate models that predict the main and interactions effects of the cultural capital on the transmission of values between parents and their children.

Beside the parents' education and individual characteristics, the regressions include additional controls for the cultural possessions, the educational resources and the number of books at home. As indicator for the parents' education we consider here the education of the most highly educated parent. The main effects model estimates the individual effect of each component of cultural capital on the student performance controlling for the other variables. Through the building of interaction terms into the model, we examine whether the children with the highest educated parents benefit the most from the family's cultural endowments (cultural reproduction) or whether the cultural capital helps the lower status children to achieve above their parents (cultural mobility).

Based on these considerations, we can formulate the following hypotheses:

Hypothesis: Cultural Reproduction

The cultural capital is high correlated with the parents' education and their socioeconomic status. Thus, the effects of socioeconomic status and / or the parents' education in main effect model become smaller (even not statistically significant) when we include channel variables, through which we expect cultural capital may influence the school performance. The interaction effect is the strongest among children whose parents are better educated.

Hypothesis: Cultural Mobility

The cultural capital is not correlated with the parents' education. It has an independent effect on school performance. Thus the effects of parents' education don't change in the main effect model when we add variables which describe the cultural capital. The interaction effect is the strongest among children whose parents have a low educational level.

The main effects model

We start our investigation by including cultural possessions. We find that the coefficients of mother's and father's education increase. The higher the level of parents' education, the more the coefficients of parents' education change. This means that cultural possessions are more strongly correlated with a higher as with a lower level of parents' education. After the inclusion of cultural possessions, the coefficient of maternal primary education is increased by 19% and the coefficient of father's

primary education by 16%. The coefficients of upper secondary education increase more, by 37 and 27%.

Table 3 presents the effects of cultural capital on the reading performance of the natives. The model 1 presents the estimates of the main effects model. The next columns present the estimates when including each variable of cultural capital.

Table 3: The main effects on reading performance for natives

NATIVES (READING)	Model 1	Model 1 + Cultural possessions	Model 1 + Home educational resources	Model 1 + Books	Model 1 + all
Mother's education (Reference: tertiary education)					
no sec. educ.	-32.58*** (11.81)	-26.10*** (11.58)	-30.92*** (11.61)	-18.62** (11.26)	-17.56** (11.16)
lower sec. educ.	-34.62*** (5.48)	-25.46*** (5.42)	-31.86*** (5.39)	-21.59** (5.29)	-18.66** (5.26)
upper sec. educ.	-15.25*** (3.94)	-9.58*** (3.89)	-15.24*** (3.87)	-8.04** (3.82)	-7.18** (3.79)
Father's education (Reference: tertiary education)					
no sec. educ.	-65.68*** (11.17)	-54.73*** (10.97)	-55.74*** (11.02)	-47.75** (10.66)	-40.68** (10.60)
lower sec. educ.	-62.15*** (5.72)	-51.65*** (5.68)	-57.24*** (5.65)	-44.96** (5.57)	-40.86** (5.55)
upper sec. educ.	-30.04*** (3.53)	-21.81*** (3.53)	-27.64*** (3.48)	-17.39** (3.49)	-14.89** (3.48)
Observations	3088	3088	3088	3062	3062
R^2	0.29	0.32	0.32	0.36	0.37

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA reading score. Also controlled for but not shown here are: gender, age, grade.

The inclusion of cultural possessions therefore slightly decreases the score gap between children with less versus better educated parents. The effect is larger at higher levels of education. This indicates that cultural possessions play a more important role for the children with better educated parents. The hypothesis of cultural reproduction is therefore confirmed.

The next variable we look at is the home educational resources. The variable of home educational resources is not strongly correlated with parents' education. The coefficients of parents' education increase, but not so much as in the model with cultural possessions. The possession of home educational resources has therefore a strongly independent effect on the reading performance of the natives. In contrast to cultural possessions model, the coefficients change more at lower levels of education. Therefore we found evidence rather for the cultural mobility as for cultural reproduction hypothesis.

The next model presents the estimates when including in the regression the number of books at home. Its inclusion has a very strong effect on the coefficients of parents' education. The coefficient of maternal primary education increases by 37% and the coefficient of father's primary education by 27%. The effects are larger at higher level of education. The coefficients of upper secondary education increase by 47%, respectively by 42%. The number of books at home is therefore strongly correlated with the parents' education of natives, especially with higher levels of education. This indicates that the number of books at home plays a more important role for the children with better educated parents. The hypothesis of cultural reproduction is therefore confirmed.

The last column of Table 3 presents the estimates when including all variables simultaneously. In this specification, the score gap between children with less versus better educated parents is the smallest. The different variables of cultural capital are significantly correlated with parents' education of native children which indicates that the hypothesis of cultural reproduction is confirmed. The father's education is more important for native students than the mother's education. A low level of father's education has a greater impact on reading proficiency of natives than a low level of mother's education. Table 4 presents the estimates of the main effect model for immigrants.

Table 4: The main effects on reading performance for immigrants

IMMIGRANTS (READING)	Model 1	Model 1 + Cultural possessions	Model 1 + Home educational resources	Model 1 + Books	Model 1 + all
Mother's education (Reference: tertiary education)					
no sec. educ.	-48.30*** (18.00)	-47.63*** (18.08)	-48.63*** (17.71)	-38.25** (17.28)	-41.67** (17.20)
lower sec. educ.	-47.72** (19.61)	-46.33** (19.70)	-45.01*** (19.30)	-37.63** (18.84)	-38.92** (18.72)
upper sec. educ.	-11.58*** (16.84)	-11.33*** (16.86)	-10.60*** (16.57)	-6.24** (16.16)	-6.11** (16.02)
Father's education (Reference: tertiary education)					
no sec. educ.	-4.15 (18.76)	-2.13 (19.07)	1.38 (18.51)	18.57 (18.57)	17.06 (18.51)
lower sec. educ.	-16.31 (20.16)	-15.01 (20.29)	-15.04 (19.83)	1.04 (19.67)	-1.56 (19.54)
upper sec. educ.	-15.46 (16.49)	-13.70 (16.76)	-15.63 (16.22)	0.81 (16.19)	-3.67 (16.21)
Observations	391	391	391	389	389
R ²	0.32	0.32	0.34	0.39	0.40

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA reading score. Also controlled for but not shown here are: gender, age, grade, language spoken at home.

In contrast to native students, the coefficients of father's education are no longer significantly different from zero and the coefficients of mother's education are higher. A low level of mother's education has a greater negative impact on reading proficiency of immigrants as on the natives' performance.

We continue our investigation by including other variables which describe cultural capital. The coefficients of cultural possessions and home educational

resources have a strongly independent effect. The inclusion of these variables has no significant impact on the coefficients of parents' education. In these specifications, the hypothesis of cultural mobility is confirmed.

To the contrary, including the number of books in the estimation, we observe that the coefficients of mother's education slightly increase and remain significant at 5%. Therefore, the number of books at home is correlated with mother's education. We found thus evidence for the hypothesis of cultural reproduction.

We look now at the impact of cultural capital on the science performance (Tables 5 and 6). We obtain similar results as by reading proficiency with some exceptions. The score gap between children with less versus better educated parents is larger in science proficiency. In contrast to reading proficiency, the father's education has a significant role on the science performance of immigrants. For natives, including the number of books, the coefficients of parents' education increase more in science as in reading proficiency, which suggests that the number of books is more correlated with parents' education in science than in reading proficiency. The results for the math performance are similar with those for the science test scores and therefore are not presented here.

Table 5: The main effects on science performance for natives

NATIVES (SCIENCE)	Model 1	Model 1 + Cultural possessions	Model 1 + Home educational resources	Model 1 + Books	Model 1 + all
Mother's education (Reference: tertiary education)					
no sec. educ.	-31.64** (12.50)	24.34** (12.22)	-30.35** (12.39)	-13.46 (11.81)	-12.43 (11.75)
lower sec. educ.	-42.23*** (5.80)	-31.90*** (5.73)	-40.09*** (5.76)	-25.85*** (5.55)	-22.97*** (5.54)
upper sec. educ.	-18.03*** (4.17)	-11.63*** (4.11)	-18.02*** (4.13)	-8.06** (4.00)	-6.78* (3.99)
Father's education (Reference: tertiary education)					
no sec. educ.	-78.45*** (11.82)	-66.11*** (11.58)	-70.74*** (11.76)	-56.67*** (11.18)	-51.69*** (11.16)
lower sec. educ.	-78.09*** (5.06)	-66.24*** (5.99)	-74.28*** (6.03)	-56.86** (5.84)	-53.40*** (5.84)
upper sec. educ.	-42.85*** (3.74)	-33.56*** (3.73)	-40.98*** (3.71)	-27.09*** (3.66)	-24.68*** (3.66)
Observations	3088	3088	3088	3062	3062
R^2	0.28	0.31	0.29	0.36	0.37

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA science score. Also controlled for but not shown here are: gender, age, grade, language spoken at home.

Table 6: The main effects on science performance for immigrants

IMMIGRANTS (SCIENCE)	Model 1	Model 1 + Cultural possessions	Model 1 + Home educational resources	Model 1 + Books	Model 1 + all
Mother's education (Reference: tertiary education)					
no sec. educ.	-57.02*** (8.88)	-56.28*** (18.06)	-57.28*** (17.80)	-47.03*** (17.23)	-49.75*** (17.24)
lower sec. educ.	-48.82** (17.97)	-47.94** (19.67)	-46.70** (19.40)	-38.92** (18.78)	-40.26 (18.76)
upper sec. educ.	-14.61 (19.57)	-14.41 (16.83)	-13.84 (16.66)	-9.53 (16.10)	-9.45 (16.06)
Father's education (Reference: tertiary education)					
no sec. educ.	-1.01 (16.81)	-9.39 (19.04)	-6.70 (18.61)	11.40 (18.51)	9.65 (18.55)
lower sec. educ.	-42.16** (18.73)	-41.11** (20.26)	-41.17** (19.94)	-25.30 (19.60)	-27.44 (19.58)
upper sec. educ.	-30.74* (16.47)	-29.32* (16.73)	-30.09* (16.31)	-14.94 (16.11)	-18.71 (16.25)
Observations	391	391	391	389	389
	0.31	0.31	0.32	0.38	0.38

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA science score. Also controlled for but not shown here are: gender, age, grade, language spoken at home.

The interaction model

We test the intergeneration transfer of cultural capital using the interaction model. Apart from the usual control variables, we add also in the regression interaction terms between different components of cultural capital and parents' education. Instead of looking at the level of education of either parent, we consider here the parents' highest education level.

Table 7 presents coefficients of the interaction terms between home educational resources and parents' education.

The home educational resources have the greatest impact on the school performance of those native students whose parents have a university degree. The respective effects decrease the lower the level of parents' education is, but not all the coefficients are statistically significant. The cultural reproduction model is therefore in part confirmed for the German students. To the contrary, for the immigrants the largest effects are those regarding the secondary education level and not the effects of tertiary education. The coefficients are statistically significant only in reading and science proficiency. The model of cultural mobility is therefore in part confirmed.

Table 8 presents the coefficients of the interaction terms between cultural possessions and parents' education for natives as well as for immigrants.

Table 7: The interaction model (1)

	Reading		Math		Science	
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
Home educational resources (hedres)	-23.61*** (4.65)	5.95 (11.30)	24.92*** (4.76)	6.10 (10.78)	18.94*** (4.92)	0.90 (11.37)
<i>Interaction terms</i>						
no sec. educ. * hedres	-9.99 (51.09)	4.73 (13.45)	-17.16 (52.30)	8.14 (12.84)	-16.69 (54.06)	7.89 (13.54)
lower sec. educ. * hedres	-8.81 (7.19)	2.04 (15.56)	-15.41** (7.36)	-4.99 (14.86)	-7.23 (7.61)	1.35 (15.66)
upper sec. educ. * hedres	-6.23 (5.19)	26.94* (15.29)	-8.05** (5.32)	10.98 (14.59)	-5.86 (5.49)	32.04** (15.38)
Observations	3036	401	3036	401	3036	401

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA scores. Also controlled for but not shown here are: gender, age, grade.

Table 8: The interaction model (2)

	Reading		Math		Science	
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
Cultural possessions (cultposs)	12.46*** (2.70)	5.03 (10.12)	12.68** (2.77)	-1.68 (9.58)	14.02*** (2.83)	0.85 (10.16)
<i>Interaction terms</i>						
no sec. educ. * cultposs	-30.54 (26.47)	-9.90 (13.09)	-31.35 (27.20)	-0.94 (12.38)	-48.31* (27.78)	-2.12 (13.13)
lower sec. educ. * cultposs	4.75 (5.91)	-25.56* (14.60)	-1.14** (6.07)	-22.69 (13.81)	4.91 (6.20)	-23.16 (14.65)
upper sec. educ. * cultposs	0.60 (3.10)	14.64 (12.67)	-2.15 (3.19)	20.21 (11.99)	0.13 (3.26)	19.81 (12.72)
Observations	3036	401	3036	401	3036	401

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA scores. Also controlled for but not shown here are: gender, age, grade.

The cultural goods play the most important role for those German students, whose parents are better educated. For immigrants, the only statistically significant is the coefficient of the interaction term between cultural possessions and secondary

education level. Therefore, we have found characteristics of cultural reproduction by German natives and characteristics of cultural mobility by immigrants.

The number of books at home has a positive statistically significant effect for either student, whose parents have a university degree (Table 9).

Table 9: The interaction model (3)

	Reading		Math		Science	
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
Books (books)	14.21*** (2.07)	15.60** (7.61)	16.73*** (2.11)	14.26** (7.18)	18.61*** (2.16)	15.27** (7.60)
<i>Interaction terms</i>						
no sec. educ. * books	-20.72 (19.50)	3.61 (9.79)	-20.94 (19.92)	5.82 (9.24)	-34.53* (20.32)	7.04 (9.77)
lower sec. educ. * books	0.61 (3.98)	-0.95* (10.89)	-8.54** (4.06)	-4.29 (10.29)	-4.08 (4.14)	-9.15 (10.88)
upper sec. educ. * books	0.40 (2.37)	11.00 (9.75)	-1.41 (2.42)	11.31* (9.21)	-1.27 (2.47)	13.37 (9.74)
Observations	3012	398	3012	398	3012	398

Regressions weighted by student sampling probabilities. Standard errors are in brackets. Significance levels: *** 1 percent, ** 5 percent, * 10 percent. Dependent variable: PISA scores. Also controlled for but not shown here are: gender, age, grade.

The interaction terms are statistically significant only for German students whose parents have a low level of education and only in math and science proficiency. This component of cultural capital has therefore more a reproductive function as a mobile one.

5. Conclusion

Using PISA data 2003 we examine the validity of cultural reproduction and cultural mobility theories in the case of immigrant students from Germany.

We show that the education of parents has a higher positive impact on the student performance only in the case of German students. Parental education has no effect on school achievement of immigrants, unless the mother has a low level of education. These results confirm previous results that, in the case of immigrants, the positive effects of a good level of education are destroyed by the shock of immigration (Gang und Zimmermann, 2000).

The educational resources influence to a greater extent the school performance of immigrants. We showed also that the educational resources influence not only directly but also indirectly the school success of the students. When we control also for the educational resources, this leads to a reduction of the negative effects that a low level of education of the parents has on the school performance of their children. Because a low level of education of the parents is a feature that concerns especially the immigrant children, this indirect effect of the home educational resources is most relevant for them. In this case, the availability of educational resources partly offset the disadvantages of the low educational parents.

The possession of cultural resources instead is a strong predictor for educational achievement only for German students. The higher the education of German parents is, the stronger the impact of the cultural goods on the school performance. This finding supports the assertion by Bourdieu, that the cultural goods are more important for the educational assets, the higher the educational level of the parents.

The results show that, in the case of natives, some of the functions of the parents' education have been transferred to the other components of the cultural capital, from which their children can benefit. This finding is a characteristic of cultural reproduction. The cultural resources are highly correlated with parental education. The relationship is stronger, the higher the parents' education. In the case of immigrant children, the cultural resources have more a mobility as a reproductive function.

These findings might have political implications. In order to improve the school performance of the immigrant children, the measures should not be addressed only to the students, but also to the parents of the immigrant children. The support measures should include in particular the mothers, especially those who have a lower educational level.

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