

Beatrice Schindler Rangvid

The Impact of Home Culture, Parental Involvement and Attitudes on Cognitive Skills of Immigrant Students in Denmark



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Beatrice Schindler Rangvid

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2009

Abstract

Using data from three Danish PISA-studies, I conduct an exploratory investigation of the relation between home culture and parental involvement and attitudes towards integration and school on immigrants' test scores. The result indicates that only a few of the indicators investigated in this study can be shown to influence students' test scores. Cultural communication is shown to be the factor of home culture that is most closely related to higher test scores.

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1 Introduction

Results from the international education literature indicate that the impact of school factors on students' achievement is relatively small compared with the influence of students' home background. Even though it is easier to change schools than to change students' home backgrounds, such changes are expected to yield much higher returns. In addition to this, results from the existing literature show that immigrant students cluster together in the same schools marginalising them socially from Danish students (Rangvid 2007). It is generally believed that students' integration in social networks with Danish students also impacts on students' academic achievement, e.g. due to better language acquisition and mutual help with schoolwork. Since which school to enrol one's child in is a choice parents make, this dimension is also regarded as being part of the influence of parents attitudes.

While the impact of parental socioeconomic status, such as education, income and family structure has been extensively studied in the literature on immigrant students' academic achievement and educational attainment, this study adds to the literature by exploring the additional impact of home culture, parental involvement and attitudes towards issues related to schooling and integration into the Danish host society. If the analysis shows that (some of) these factors are clearly related to student achievement, these results might point at specific policy actions for immigrant families with school children.

This study uses quantitative analyses to gain an insight into the impact of students' home background on academic achievement. Data from several PISA-assessments enable me to examine different aspects concerning students' home culture, e.g. whether parents talk with their children about school, about political/social issues or about books, movies and TV-programmes, and the amount of educational resources in the students' homes (textbooks, dictionaries, a desk for studying, a quiet place to study). Moreover, several aspects concerning parental involvement in their child's schooling and attitudes towards integration in the host society are examined, e.g. the language spoken at home (Danish or other), homework assistance from parents, aspects concerning parents' acceptance of their children's absence from school, of children's participation in mother-tongue lessons, leisure time activities, paid jobs and the immigrant concentration in the school in which parents chose to enrol their child are included in the analysis.

2 Existing literature

In the literature of education economics, whether increasing financial resources at schools will improve student achievement has been debated for many years. Existing studies, investigating the effects of factors such as class size (e.g. Angrist & Lavy 1999), birth order and family size (Hanushek 1992), peer effects (Hanushek et al. 2003), or teacher characteristics (e.g. Rivkin, Hanushek & Kain 2005) have found widely different results. Some have found positive effects (Krueger 1999), others insignificant or even negative effects (Hanushek 1996).

The landmark 1996 Coleman report – which found evidence that poor black children did perform better in integrated middle-class schools – also highlighted family background as a key component of educational production. Typically, a set of family variables are included, such as parental education and income. Hanushek (1992) notes the difficulty of controlling for the quality of parental time directly due to data limitations and uses family background variables as a proxy. The related literature on household production and time-allocation focuses on housework, childcare and female labour supply issues. Mother's education was found to have the most impact on time spent with children and plays thus a central role. In this study, I investigate further the role that factors associated with parental effort such as home culture, parental involvement and attitudes play in the production of academic achievement. Specifically, I concentrate on the role these issues play in the education production function of *immigrant* school children.

3 Data and sample

Sample

In this project, I use a combined sample consisting of the so-called PISA-Ethnic study from 2005, the 2004 Copenhagen PISA study, and the Danish part of the 2000 international PISA study. I combine these datasets to maximise the number of immigrant students in the final dataset¹. The first of those studies is a Danish PISA replicate study conducted in 2005 sampling 9th graders in schools with high immigrant concentrations (PISA-Ethnic). The second assessment focused on Copenhagen schools and was administered to all 9th graders in Copenhagen public schools and a number of private schools in 2004 (PISA-Copenhagen). The last part is the Danish subsample of the international PISA 2000 assessment (PISA-2000). Table 3.1 presents selected summary statistics for each of these datasets. The PISA-Ethnic sample contributes the most to the final sample with 1,189 immigrant students, almost 60% of the total sample, while PISA-Copenhagen and PISA-2000 contribute with 654 and 204 observations, respectively. The combined dataset includes 2,047 immigrant students.

Of the three datasets in the analysis, only the PISA-2000 dataset is a representative sample of the total population, while the other datasets oversample immigrant students (and their native peers). This has implications for the interpretation of results, if there are heterogeneous effects. Since the results in the pooled sample are a weighted average of a representative sample and non-representative samples, with most weight on the non-representative samples, the validity of results may be restrained to immigrant dense schools or school districts.

Some variables are not available in all datasets. E.g. parental highest occupation² is not available in the PISA-Ethnic dataset and is therefore in the PISA-Ethnic dataset replaced by parental income drawn from administrative registers. Also, information on mother-tongue teaching and time spent on organised leisure activities and on paid work is only available in the Danish datasets (PISA-Copenhagen and PISA-Ethnic). Results for these variables are therefore based on a slightly smaller number of observations.

¹ I have considered including data from the international PISA 2003 and 2006 assessments, too. Unfortunately, the bulk of the variables on parental involvement has been dropped from the 2003 & 2006 surveys, and including these samples is therefore irrelevant.

² This measure is in the PISA-setting used as a measure of parental income.

Table 3.1 Descriptive statistics for variables

| | PISA-2000 | | PISA-Copenhagen | | PISA-Ethnic | | Pooled sample | |
|--|-----------|-------|-----------------|-------|-------------|-------|---------------|-------|
| | Obs | Mean | Obs | Mean | Obs | Mean | Obs | Mean |
| <i>Outcome measure:</i> | | | | | | | | |
| Reading test scores | 204 | 421 | 654 | 405 | 1189 | 404 | 2047 | 406 |
| <i>SES controls:</i> | | | | | | | | |
| Females | 182 | 0,49 | 521 | 0,51 | 1193 | 0,54 | 1896 | 0,52 |
| <i>Years of education</i> | | | | | | | | |
| - Father | 191 | 10,5 | 618 | 10,1 | 1158 | 9,9 | 1967 | 10 |
| - Mother | 200 | 8,6 | 644 | 9,3 | 1185 | 8,5 | 2029 | 8,7 |
| Nuclear family | 201 | 0,71 | 642 | 0,73 | 1144 | 0,76 | 1987 | 0,74 |
| Number of siblings | 203 | 1,5 | 638 | 2,7 | 1193 | 1,8 | 2034 | 2 |
| Parental occupational status | 165 | 43 | 501 | 40 | - | - | 666 | 40 |
| Parental income ('000 DKK) | - | - | - | - | 1031 | 292 | 1031 | 292 |
| <i>Father:</i> | | | | | | | | |
| Full time | 179 | 0,54 | 583 | 0,53 | - | - | 762 | 0,53 |
| Part time | 179 | 0,09 | 583 | 0,07 | - | - | 762 | 0,08 |
| Unemployed | 179 | 0,16 | 583 | 0,1 | - | - | 762 | 0,12 |
| Out of labour force | 179 | 0,22 | 583 | 0,3 | - | - | 762 | 0,28 |
| <i>Mother:</i> | | | | | | | | |
| Full time | 192 | 0,38 | 614 | 0,32 | - | - | 806 | 0,33 |
| Part time | 192 | 0,11 | 614 | 0,11 | - | - | 806 | 0,11 |
| Unemployed | 192 | 0,19 | 614 | 0,13 | - | - | 806 | 0,14 |
| Out of labour force | 192 | 0,32 | 614 | 0,45 | - | - | 806 | 0,42 |
| <i>Father:</i> | | | | | | | | |
| Self-employed | - | - | - | - | 1041 | 0,10 | 1041 | 0,10 |
| High occup. status | - | - | - | - | 1041 | 0,03 | 1041 | 0,03 |
| Middle/low occup. status | - | - | - | - | 1041 | 0,36 | 1041 | 0,36 |
| Not working | - | - | - | - | 1041 | 0,51 | 1041 | 0,51 |
| <i>Mother:</i> | | | | | | | | |
| Self-employed | - | - | - | - | 1145 | 0,04 | 1145 | 0,04 |
| High occup. status | - | - | - | - | 1145 | 0,01 | 1145 | 0,01 |
| Middle/low occup. status | - | - | - | - | 1145 | 0,31 | 1145 | 0,31 |
| Not working | - | - | - | - | 1145 | 0,64 | 1145 | 0,64 |
| <i>Home culture:</i> | | | | | | | | |
| Cultural communication | 193 | -0,25 | 616 | -0,19 | 1122 | -0,27 | 1931 | -0,24 |
| Social communication | 195 | -0,30 | 629 | -0,20 | 1145 | -0,18 | 1969 | -0,20 |
| Home educational resources | 199 | -0,04 | 639 | -0,17 | 1160 | -0,02 | 1998 | -0,07 |
| Cultural possessions | 201 | -0,47 | 643 | -0,55 | 1161 | -0,50 | 2005 | -0,52 |
| <i>Parental involvement & attitudes:</i> | | | | | | | | |
| Speak Danish at home | 201 | 0,23 | 570 | 0,19 | 912 | 0,20 | 1683 | 0,20 |
| Mother-tongue teaching | - | - | 630 | 0,56 | 1134 | 0,61 | 1764 | 0,59 |
| Time on org. leisure activities | - | - | 597 | 1,87 | 1127 | 1,37 | 1724 | 1,54 |
| Time on job | - | - | 522 | 1,70 | 1055 | 1,60 | 1577 | 1,63 |
| Parental help with school work | 197 | 2,42 | 622 | 2,45 | 1109 | 2,35 | 1928 | 2,39 |
| <i>Perc. immigrant peers in school</i> | | | | | | | | |
| 0-10% | 204 | 0,25 | 654 | 0,04 | 1193 | 0,03 | 2051 | 0,05 |
| 10-25% | 204 | 0,34 | 654 | 0,18 | 1193 | 0,19 | 2051 | 0,20 |
| 25-50% | 204 | 0,31 | 654 | 0,19 | 1193 | 0,32 | 2051 | 0,28 |
| 50%+ | 204 | 0,10 | 654 | 0,60 | 1193 | 0,46 | 2051 | 0,47 |

Definitions of immigrants

In accordance with the definition of Statistics Denmark, immigrants are defined as students, whose parents both have origins in non-Western countries³. Where available, I use information on ethnicity drawn from administrative registers. For the 9% of the sample which is lacking this information, I use data from the PISA-questionnaires instead⁴, which leaves me with only 23 observations with missing information on ethnicity. Immigrants from Western countries are very few in number (74 students). This group is excluded from the analysis. Of the 2,047 students in our combined sample, 45% are first generation immigrants (i.e. born abroad), while the remaining 55% are born in Denmark (labelled the second generation)⁵.

Dependent variable

All three assessments use the framework of the first international PISA assessment (conducted in the year 2000) with reading being the main assessment area. I use reading literacy test scores as our main outcome measure, because the math and science tests were given to only half the students in the sample and the sample size is therefore much smaller for these areas and results are therefore less precise. Yet, in a separate section, I provide suggestive results for math and science, too.

The PISA tests focus on the demonstration of knowledge and skills in a form that is relevant to everyday life challenges rather than how well students master a specific school curriculum. Using Item Response Theory to compute the scores, PISA mapped reading performance on a scale which has been standardised to an OECD average score of 500 points and a standard deviation of 100 points. Average reading scores for the immigrant sample are 406 points, compared to 501 for Danes, a difference of almost one standard deviation, which is about the same size of gap that is commonly found for Black and White students in the US. The second generation does only slightly better than the first: 411 vs. 400 points⁶.

Variables of interest

The variables of interest are divided into two sets of variables: a set of four indicators, which are straightforward indicators of home culture. These four indicators are investigated in the first part of our empirical analysis. However, I am also interested in investigating other aspects of students' background like the language spoken at home, help with schoolwork etc. Some of these indicators are more obviously endogenous to test scores (in particular help with schoolwork) and results are therefore primarily descriptive. The four indicators of home culture are: cultural communication, social communication, home educational resources and cultural possessions⁷.

Dimensions of parental involvement and attitudes are: the language spoken in the student's home most of the time (Danish or other), family's help with schoolwork, parental ac-

³ Western countries are defined as EU25 and other Western European countries, North America, Japan, Australia and New Zealand.

⁴ The reason why I do not use PISA-data as the first choice is that information on ethnicity from the student questionnaires is missing in the PISA-Ethnic sample, which is more than half of my sample of immigrants.

⁵ If information on country of birth is missing for one parent, the child is an immigrant if the other parent is born abroad, otherwise the child is a native Dane in our definition.

⁶ This difference is significant at the 5% level.

⁷ There is another indicator that could possibly be included in the analysis, too, namely information on cultural activities like visiting a museum, attending an opera or watching live theatre. There are two problems with this indicator, though. First, this indicator is not available in the PISA-Ethnic dataset, which makes up 60% of the immigrant sample. Second, from the wording of the questionnaire, there is no information on, whether the student engaged in these activities *together* with his parents/family. I therefore decided against including the indicator in the empirical analysis.

ceptance of student absence from school, participation in courses teaching the mother tongue, time spent on leisure activities, time spent on paid work, and the percentage of immigrant students in the child's school.

The first four indicators are based on a range of related items from the student questionnaire. Since the items describing each single factor are thought to be different dimensions of a common underlying factor, they should be grouped into a single index, since including them one by one is likely to produce insignificant estimators due to their high correlation. Therefore, I combine variables measuring home culture into scales that measure conceptually distinctive dimensions of home culture.

As a first step of the analysis, I look at two types of communication between parents and child. The first dimension is a scaled measure of cultural communication. The index of *cultural communication* is derived from students' reports on the frequency with which their parents (or guardians) engaged with them in the following activities: discussing political or social issues; and discussing books, films or television programmes. Students receive one point for discussing this with their parents 'never or hardly ever', 2 points for 'a few times a year', 3 points for 'about once a month', 4 points for 'several times a month' and 5 points for 'several times a week', resulting in a possible range of 2 to 10 on this scale⁸.

A second type of communication centres on *social communication* (interaction). This includes the frequency with which parents discuss (i) how well their child is doing at school, (ii) eat the main meal with their child around a table, and (iii) spend time just talking to their child. This scale is scored similarly to the cultural communication scale, with a possible score of 1 to 5 for each item and 3 to 15 for the summed scale.

Next, I include a measure of *home educational resources*. This scale includes three items: whether the student has a dictionary in his home, a quiet place to study and a desk for studying. These three items are yes-no format questions for which students can receive 1 point, resulting in a possible range of 0 to 3 on this scale.

Finally, I index *cultural possessions*. This scale includes having textbooks, classical literature, books of poetry, works of art, and whether the student has more than 250 books in his home. These items are also yes-no format questions for which students can receive 1 point, resulting in a possible score of 0 to 5 on this scale⁹.

The dimensions of parental involvement and attitudes are scaled as follows. Language spoken at home (Danish or other) and participation in courses teaching the mother tongue are yes-no format questions. Moreover, I have created an index on total help from the parents. The index ranges from 1 to 5 with steps of 0.5, with 1 indicating that neither parent ever helps the student with her schoolwork, and 5 indicating that both parents help the student several times a week. I have then grouped the index values into three categories: category 1 for index-values of 1 and 1.5 meaning that parents never or only rarely help their child with his schoolwork, category 2 for values in the range of 2 to 3.5 indicates that parents help a few times a year to once a month (for both parents on average), while category 3 means that the index value is 4 to 5, indicating frequent help from both parents (several times a month to several times a week). Next, I index parental acceptance of student's absence from school.

⁸ This measure of cultural communication deviates slightly from what is used in the official PISA-dataset, where also another item is included (the frequency with which the student listens to classical music with his parents). Yet, since listening to classical music is no direct communication – which is what I want to focus on – this item is not included in my analysis.

⁹ Also this measure deviates slightly from the definition used in the official PISA-dataset, where only three of the five items are used for the index. Yet, an auxiliary principal component analysis conducted on the present dataset suggested the inclusion of two additional items: whether the student has textbooks in his home and the number of books (overall) in his home.

Students receive 1 point for not missing school a single day in the previous four school weeks, 2 points for missing ‘one to two times’, 3 points for ‘three to four’ times and 4 points for ‘five times or more’.

I look at two types of afternoon/weekend activities: time used in organised leisure activities and in a paid job. Both dimensions are indexed by a single question that asks how many hours the student spends a week on each activity. Students get 1 point for engaging in the activity less than four hours a week, 2 points for ‘five or six hours’, and 3 points for ‘seven hours or more’. Finally, I create four categories for the percentage of immigrant students in the child’s school: 0-10%, 10-25%, 25-50% and more than 50%.

Control variables (socioeconomic status)

A range of measures of the students’ socioeconomic status is included in the regressions as controls to identify the *additional* impact of home culture on student achievement. Since dimensions like cultural communication and possessions are probably to some degree correlated with parental education, not including controls for socioeconomic status (hereafter, SES) would probably overstate the correlation between our variables of interest and test scores. The SES variables include child and family characteristics that likely affect effort through preferences or resource constraints and affect achievement as an input.

Therefore, I include information on the student and her family. In addition to student’s gender, I include a set of variables capturing opportunity costs, preferences, and resources: family size (nuclear family, number of siblings), parental education, occupation, labour-market status and income. As an alternative to the full set of controls for labour-market status, I have created a much more simple set consisting of four indicators: (i) both parents in job, (ii) no parent in job, (iii) only father in job, and (iv) only mother in job. In Table 4.2, I present regression results including one set at a time in order to decide whether I can settle for the more simple specification.

Empirical approach

The empirical assessment starts with a regression of student test scores on SES controls as a baseline. I control for student and family characteristics (X) such as student’s gender, family structure and number of siblings, parental education, occupation, labour-market attachment and income, to investigate how much of the variation in test scores is taken account of by the typical set of SES controls. If i indices individuals, the model with the continuous variable $READ_i$ describing reading test scores is:

$$READ_i = \alpha + \beta_0 X_i + \varepsilon_i \quad (1)$$

where the α and β_0 are coefficients, and ε_i is a random error.

The next step are *separate* sets of regressions (with and without SES controls) of reading test scores ($READ$) on each of our measures for home culture, since the four dimensions of home culture are probably highly correlated. In an additional set of regressions, I enter all four dimensions *jointly* in the regression. Formally, these models can be written as:

$$READ_i = \alpha + \beta_1 HC_i + \varepsilon_i \quad (2)$$

$$READ_i = \alpha + \beta_0 X_i + \beta_1 HC_i + \varepsilon_i \quad (3)$$

where HC_i are the four dimensions of home culture. The coefficients β_1 for the different measures of home culture inform about the correlation between measures of home culture and reading scores. If the measure of home culture is associated with educational achievement, the coefficient yields an estimate that is significantly different from zero. If this difference is due to compositional effects of sociodemographic characteristics of the student and his family, the effect should disappear once the control variables (X) are introduced. In the second part of the empirical analysis (4.3), equations (2) and (3) are estimated for each dimension of parental involvement and attitudes. All regressions are estimated by Ordinary Least Squares with adjustment of the standard errors for clustering at the school level.

Section 4.4 provides some sensitivity checks of the results of the main analysis. The first check is the inclusion of immigration-specific control variables like immigrant generation and country of origin, which may have an additional impact over and above the usual set of SES controls. As a second check, I include school fixed effects in the regression to make sure that differences in school resources and parents' school choice preferences are not driving the results alone. Last, we provide suggestive evidence on math and science scores, which are available only for roughly half of the student sample.

4 The impact of home culture and parental involvement and attitudes on student achievement

4.1 Outcomes and controls

The main outcome measure used in this study is PISA-reading test scores. The test score mean for immigrants is 406 and the standard deviation is close to the international standard deviation of 100. A histogram of the distribution is shown in Figure 4.1. The distribution is symmetric around the mean with a minor concentration of students at the lower tail of the distribution.

Figure 4.1 Distribution of reading scores

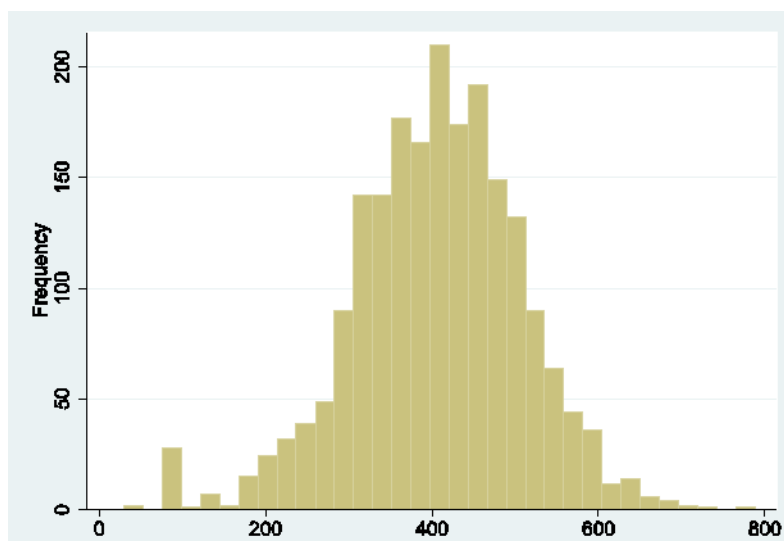


Table 4.1 shows average reading scores for various subsamples delineated by different dimensions of SES. Girls fare better than boys, students with higher educated parents, with higher occupational status, better labour-market attachment and higher income all do better. Moreover, students with fewer siblings do better, while students in nuclear families only do marginally better.

Table 4.1 By group means of reading scores

| | Mean reading scores | Size of subgroup |
|---|---------------------|------------------|
| Males | 394 | 51% |
| Females | 413 | 49% |
| Father: max lower secondary education | 391 | 49% |
| Father: more than lower secondary education | 422 | 51% |
| Mother: max lower secondary education | 396 | 61% |
| Mother: more than lower secondary education | 422 | 39% |
| Nuclear family | 410 | 72% |
| Other family types | 397 | 28% |
| Up to two siblings | 411 | 68% |
| More than two siblings | 394 | 32% |
| Lower 50% of parental occupational status | 410 | 50% |
| Upper 50% of parental occupational status | 433 | 50% |
| Lower 50% of parental income | 393 | 50% |
| Upper 50% of parental income | 417 | 50% |
| <i>Parental labour-market attachment:</i> | | |
| Both parents in job (full or part time) | 427 | 29% |
| None of parents in job | 394 | 35% |
| Only father in job | 402 | 25% |
| Only mother in job | 420 | 11% |

As controls, I use the common range of variables describing parental resources and the family situation. Summary statistics for these dimensions of SES are available in Table 3.1 (column 4 for the entire sample). Regarding income and economic circumstances of the family, a key piece of information is the highest parental occupation and income. These measures provide a good indication of the family's financial circumstance. Whether students live with both biological parents or not (72% live with both parents), and the number of children in the home are also facts about the family that are used in the analysis (68% live in families with up to three children). Finally, I know father's and mother's years of education, which is a useful indication of their human capital. These are the measured resources of the family. Furthermore, I control for students' gender and labour-market attachment.

Using multiple regression analysis, I can consider the total impact of SES on students test scores. Table 4.2 reports the regression analyses for the students' reading test score. The results document the influence of the family's socioeconomic background on the reading test scores. Children have higher reading test scores in families with higher parental education, occupation and income. Children in families with a larger number of children have lower test scores¹⁰, and girls outperform boys. The only variable which is not significantly related to test scores, once the other variables are controlled for, is family structure, i.e. whether the student lives with both parents or not. Due to correlation, single coefficient estimates should be interpreted with great caution.

¹⁰ When I conduct the analysis by gender, it becomes apparent that only girls are harmed by more siblings.

Table 4.2 Regression results with only SES-controls

| | Model 1 | | | Model 2 | | |
|--|-----------|----------|------|-----------|----------|------|
| | Coef. | Std. Err | P> t | Coef. | Std. Err | P> t |
| Females | 18,59 | 4,57 | 0,00 | 20,92 | 4,60 | 0,00 |
| Years of education: father | 2,53 | 0,52 | 0,00 | 2,66 | 0,52 | 0,00 |
| Years of education: mother | 1,03 | 0,48 | 0,03 | 1,18 | 0,49 | 0,02 |
| Nuclear family | 9,47 | 5,65 | 0,09 | 7,09 | 5,81 | 0,22 |
| Number of siblings | -4,90 | 1,56 | 0,00 | -5,87 | 1,56 | 0,00 |
| Parental occupational status | 0,52 | 0,22 | 0,02 | 0,51 | 0,22 | 0,02 |
| Parental income ('000 DKK) | 0,03 | 0,02 | 0,23 | 0,06 | 0,02 | 0,00 |
| <i>Father's labour-market status (PISA2000 & PISA-Copenhagen samples):</i> | | | | | | |
| Full time | Reference | | | | | |
| Part time | -9,32 | 13,96 | 0,50 | | | |
| Unemployed | 2,23 | 11,76 | 0,85 | | | |
| Out of labour force | 9,26 | 8,85 | 0,30 | | | |
| <i>Mother's labour-market status (PISA2000 & PISA-Copenhagen samples):</i> | | | | | | |
| Full time | Reference | | | | | |
| Part time | -13,78 | 12,30 | 0,26 | | | |
| Unemployed | -21,76 | 11,24 | 0,05 | | | |
| Out of labour force | 3,32 | 8,58 | 0,70 | | | |
| <i>Father's labour-market status (PISA-ethnic sample):</i> | | | | | | |
| Self-employed | Reference | | | | | |
| High occupational status | 80,01 | 20,28 | 0,00 | | | |
| Middle/low occupational status | 21,10 | 11,08 | 0,06 | | | |
| Not working | 15,04 | 10,75 | 0,16 | | | |
| <i>Mother's labour-market status (PISA-ethnic sample):</i> | | | | | | |
| Self-employed | Reference | | | | | |
| High occupational status | 44,96 | 32,52 | 0,17 | | | |
| Middle/low occupational status | -16,46 | 16,50 | 0,32 | | | |
| Not working | -43,33 | 15,94 | 0,01 | | | |
| <i>Reduced set for labour-market status:</i> | | | | | | |
| Both parents in job (full or part time) | | | | Reference | | |
| No parent in job | | | | -12,76 | 6,63 | 0,05 |
| Only father in job | | | | -13,36 | 6,60 | 0,04 |
| Only mother in job | | | | 4,32 | 8,54 | 0,61 |
| Number of observations | 2047 | | | 2047 | | |
| Adj R-squared | 0,09 | | | 0,07 | | |

Table 4.2 presents results from two regressions: the first includes the full set of available measures of labour-market status and attachment, the second includes a reduced set of indicators instead. As is seen, few single coefficient estimates are significant, but together both sets of controls for labour-market status are highly significant. Yet, the amount of variation

in test scores explained by Model 1 is largest (R^2). Therefore, I decided to use Model 1 in the analyses.

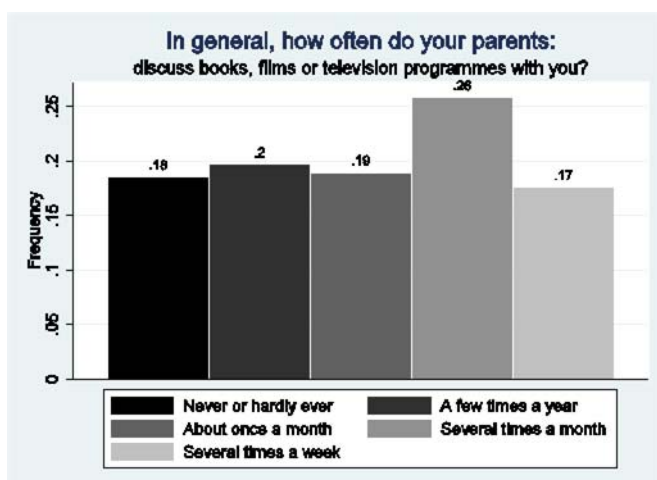
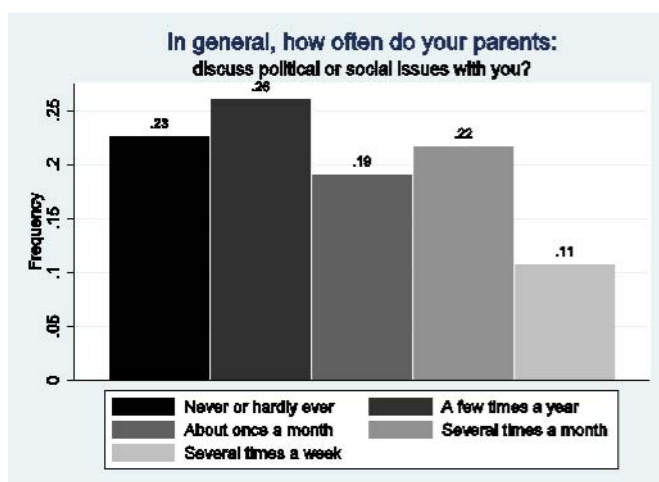
4.2 Home culture

Four dimensions of home culture are considered in the following analysis: cultural communication, social communication, home educational resources and cultural possessions.

4.2.1 Cultural communication

Two items are used to describe cultural communication, one dimension of home culture. Students have been asked how often their parents discuss (i) political or social issues and (ii) books, films or television programmes with them. Figure 4.2 shows frequencies for these items. Overall, one in three immigrant students discusses political and social issues with their parents on a regular basis, i.e. several times a month or more. Yet, half of the immigrant students only rarely engage in discussing such issues with their parents (a few times a year at most). The frequency with which students engage in discussing books, films and TV programmes with their parents is somewhat higher: 45% do so regularly, while 40% rarely do.

Figure 4.2 Distribution of answers: cultural communication



As explained in section 3, an index of cultural communication is calculated on the basis of these two items. The scale of this index is standardised with a mean of 0 and a standard deviation of 1 for the entire sample (i.e. immigrants and Danes), so that results can be easily interpreted and comparisons be made between scales. In the upper part of Table 4.3, overall means and group means for the four indices of home culture are displayed. Column 1 shows the means for the cultural communication index. For immigrants, the index of cultural communication has a mean of -0.24 (which means a quarter of a standard deviation lower than for the total sample of Danes and immigrants).

Table 4.3 Results for home culture

| | Cultural communica- tion (1) | Social communica- tion (2) | Home educ. resources (3) | Cultural possessions (4) |
|---|---------------------------------------|-------------------------------------|--------------------------------|--------------------------------|
| All | -0,24 | -0,2 | -0,07 | -0,52 |
| Boys | -0,35 | -0,32 | -0,06 | -0,59 |
| Girls | -0,17 | -0,08 | -0,06 | -0,49 |
| Myos<=9 | -0,32 | -0,24 | -0,13 | -0,61 |
| Myos>9 | -0,12 | -0,12 | 0,04 | -0,37 |
| Fyos<=9 | -0,34 | -0,26 | -0,1 | -0,65 |
| Fyos>9 | -0,14 | -0,12 | -0,03 | -0,37 |
| Nuclear family | -0,22 | -0,11 | -0,05 | -0,52 |
| Not nuclear family | -0,31 | -0,42 | -0,14 | -0,49 |
| <=2 siblings | -0,23 | -0,19 | -0,03 | -0,5 |
| >2 siblings | -0,26 | -0,22 | -0,14 | -0,54 |
| Low HISEI | -0,32 | -0,24 | -0,17 | -0,69 |
| High HISEI | -0,02 | -0,16 | 0,01 | -0,31 |
| Low income | -0,27 | -0,15 | -0,07 | -0,53 |
| High income | -0,24 | -0,12 | 0,02 | -0,47 |
| Both parents in job (full or part time) | -0,14 | -0,12 | -0,002 | -0,39 |
| No parent in job | -0,28 | -0,25 | -0,13 | -0,52 |
| Only father in job | -0,26 | -0,07 | -0,1 | -0,56 |
| Only mother in job | -0,2 | -0,14 | 0,05 | -0,59 |
| Turkey | -0,28 | -0,2 | -0,04 | -0,5 |
| Ex-Yugoslavia | -0,23 | 0,03 | -0,19 | -0,66 |
| Pakistan | -0,24 | -0,19 | 0,02 | -0,6 |
| Lebanon | -0,19 | -0,08 | -0,08 | -0,48 |
| Gen1 | -0,26 | -0,28 | -0,12 | -0,48 |
| Gen2 | -0,23 | -0,12 | -0,03 | -0,55 |
| Regression results | | | | |
| <i>Separate estimations</i> | | | | |
| <i>Without SES-controls</i> | | | | |
| Coef | 17,60 | 9,32 | 9,51 | 14,38 |
| Se | 2,30 | 1,89 | 2,11 | 2,60 |
| Adj. R-sq | 0,05 | 0,02 | 0,01 | 0,02 |
| <i>With SES-controls</i> | | | | |
| Coef | 13,05 | 6,84 | 6,59 | 8,84 |
| Se | 2,30 | 1,86 | 2,05 | 2,59 |
| Adj. R-sq | 0,12 | 0,10 | 0,10 | 0,10 |
| <i>Joint estimation</i> | | | | |
| <i>Without SES-controls</i> | | | | |
| Coef | 13,57 | 2,71 | 5,90 | 7,16 |
| Se | 2,61 | 2,06 | 2,16 | 2,72 |
| Adj. R-sq | | 0,05 | | |
| <i>With SES-controls</i> | | | | |
| Coef | 10,69 | 2,01 | 4,47 | 3,63 |
| Se | 2,54 | 2,03 | 2,10 | 2,69 |
| Adj. R-sq | | 0,12 | | |

Parents engage in cultural communication more frequently with their daughters than with their sons, a result that is also found by Houtenville & Smith Conway (2008). Students with higher educated parents engage more often in cultural communication, as do students in families with higher occupational status, while there is no significant difference by income. Students who live with both parents do marginally more often engage in cultural communication, while whether the student has many or few siblings does not seem to play a part. There is no significant difference between the four countries of origin or by immigrant generation.

In the middle part of Table 4.3, each column presents the coefficients for each home culture indicator from separate regressions. The bottom panel presents coefficients for the four home culture indicators after including all four in the same regression. Since the scales for the human capital indices are standardised, the coefficient in Table 4.3 implies that a one unit (=1 SD) increase in the index of cultural communication is associated with a 0.18 SD increase in reading scores in a regression without controls, and 0.13 SD in a regression with controls for SES included. Thus, as expected, controlling for differences in SES decreases the coefficient estimate, but higher levels of cultural communication are significantly related to higher reading scores also after controlling for SES.

4.2.2 Social communication

Figure 4.3 shows frequencies for the three items which enter into the calculation of the index of social communication. Overall, just over half of all immigrant students discuss how well they are doing at school with their parents several times a week, and further 27% do so several times a month. Yet, about 8% only rarely discuss this issue with their parents (a few times a year at most). There may be two reasons why students do not discuss school with their parents: either, because they are doing just fine, or, because parents are not interested in discussing school even though their children may not be strong learners. When I calculate average test scores, I find that students who rarely discuss how they are doing at school do much worse than the average.

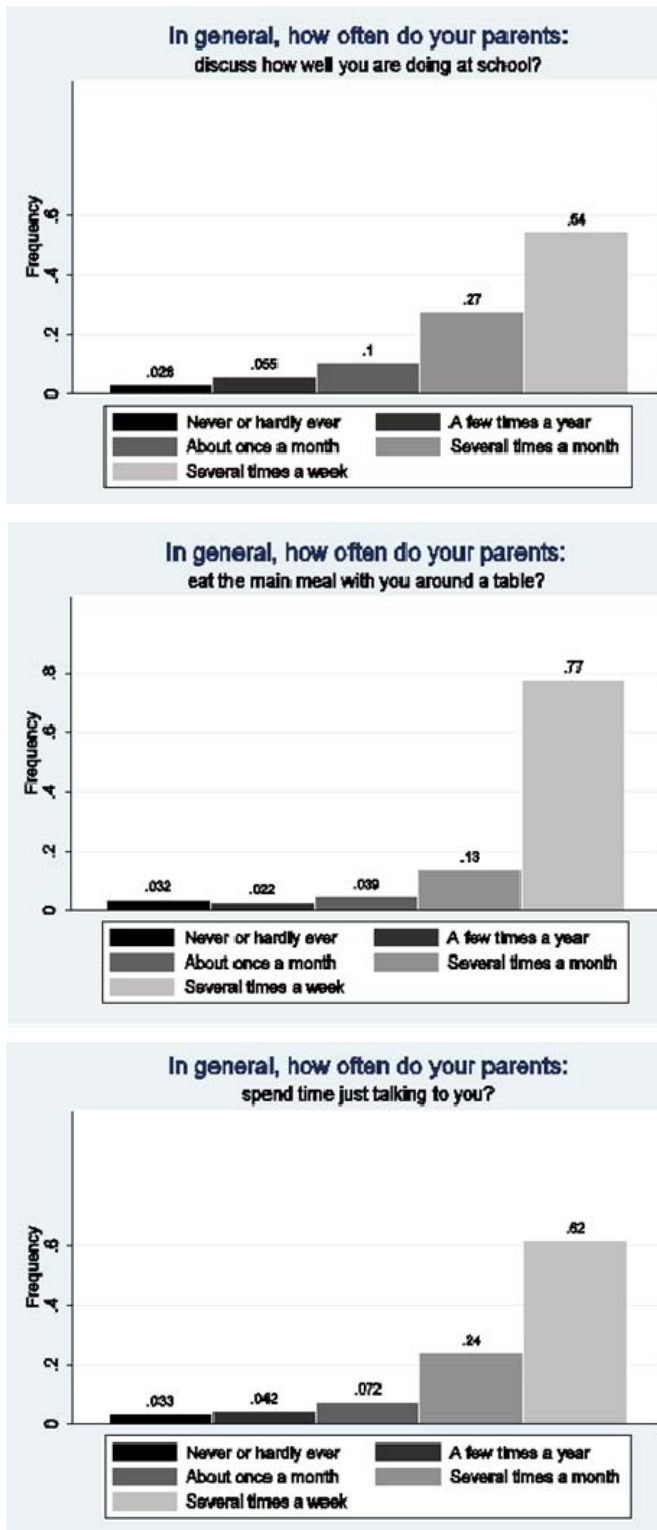
The frequency with which parents eat a main meal around the table or spend time just talking with the student is higher than discussing school: 77% and 62% do this several times a week. Still, considering that these must be regarded as key indicators of a regular contact between parents and children, these numbers are not high¹¹.

Answers to the three single items are gathered in a common index of social communication¹². For immigrants, the index of social communication has a mean of -0.20 (i.e. one fifth of a standard deviation lower than for the entire sample), see Table 4.3, second column.

¹¹ For Danes, the respective numbers are: 87% and 74%. Only little of the gap between immigrants and Danes disappears, when SES is controlled for.

¹² As for cultural communication, the scale is standardised with a mean of 0 and a standard deviation of 1 for the entire sample (i.e. immigrants and Danes).

Figure 4.3 Frequencies of answers for dimensions of social communication



As with cultural communication, girls engage in social communication more frequently than boys, as do students with higher educated parents, while there is no difference by the family's financial means (occupation/income). Students who live with both parents engage more often in social communication, while whether the student has many or few siblings does not

seem to play a role. There is no difference by country of origin, but first generation students engage less in social communication with their parents than immigrant students born in Denmark.

Results from multiple regressions of test scores on social communication are reported in Table 4.3 (middle panel, column 2). The size of the coefficient estimate means that a one unit increase in the index for social communication is associated with a 0.09 SD increase in reading scores in a regression without controls, and 0.07 SD in a regression where controls for SES are included. Thus, the SES-corrected relation between cultural communication and reading scores is substantially higher than between social communication and test scores¹³.

4.2.3 Home educational resources

Three dimensions of home educational resources are considered: having a dictionary in one's home, having a desk for studying and having a quiet place to study. Frequency counts of these three items reveal that almost all students have a dictionary at home (96%), and 91% have a desk for studying and 84% answer that they have a quiet place to study.

Table 4.3, column 3, shows that for immigrants, the index of home educational resources has a mean of -0.07 (i.e. the gap to Danes is much smaller than for the communication indices). There are two differences compared to results for the communication indices: first, there is no gender gap for home educational resources, and the number of siblings has here a clear negative correlation with the level of home educational resources¹⁴. Otherwise, the results for home educational resources are broadly similar to those for cultural communication and social communication: students with higher educated mothers and parents with higher occupational status have higher levels of home educational resources and there is no significant difference between country of origin. Just as for cultural communication, there is no difference between immigrant generations.

Results of a multiple regression analysis of test scores on home educational resources (Table 4.3, middle panel, column 3) show that a one unit increase in the scale for home educational resources is associated with a 0.10 SD increase in reading scores in a regression without controls, and 0.07 SD in a regression where controls for SES are included. Thus, the correlation between home educational resources and reading scores is quite similar to that for social communication, but much lower than that for cultural communication.

4.2.4 Cultural possessions

The index of cultural possessions includes four items: having textbooks, classical literature, works of art and more than 250 books at home. Frequency counts show that about 40% of students have textbooks in their home, about 30% have some classical literature or poetry, almost 50% have some work of art and 9% have more than about 250 books in their home¹⁵.

The means for cultural possession levels in Table 4.3 indicate that for immigrants the index of cultural possessions has a mean of -0.52 (i.e. half a standard deviation below the full

¹³ Since one could easily imagine that talking about school can happen more frequently as a consequence of not doing so well at school, the direction of causality is likely to be reversed for this item, which may decrease the estimate for the social communication index. To make sure that this is not driving the results, I have repeated the regression with a version of the social communication index not including this item. Results are virtually unchanged, suggesting that this is of no great concern.

¹⁴ An additional analysis shows that, interestingly, the difference is not due to the item *quiet place to study*, as one would expect to be related to family size, but to *dictionary* and *desk for studying*.

¹⁵ Only 9% of immigrants have more than 250 books. I have conducted a robustness-check on the coding of the books-variable: regression results are very similar when the cutoff-point is set at lower levels, e.g. 10 or 100 books.

sample mean). Differences in cultural possessions are most substantial by parental education and occupation: students with higher educated parents, and parents with a higher occupational status and better labour-market attachment (both parents in job) have higher levels of cultural possessions. Interestingly, while these questions are asked about the *household/home* of the student, girls seem to enjoy higher levels of cultural possessions¹⁶.

Results of multiple regressions of test scores on cultural possessions are reported in Table 4.3, middle panel, column 4. A one unit increase in the scale for cultural possessions is associated with a 0.14 SD increase in reading scores in a regression without controls, and 0.09 SD in a regression where controls for SES are included.

The results on regressions, which include each index of home culture separately (Table 4.3, middle panel) show that all of the specific dimensions of home culture are statistically significantly associated with reading skills: cultural and social communication, home educational resources and cultural possessions in the home, all show significant and positive associations. Including SES controls reduces the estimated coefficients by 20-35%, but all estimates stay positive and significant. The association is largest for cultural communication. The second highest correlation is found for cultural possessions, so the distinct cultural aspect in the students' parental home background is clearly important.

Yet, while all four indices are significantly related to reading scores when included separately, only cultural communication adds substantially to the explanatory power compared to the base-model including SES only ($R^2=0.09$ vs. 0.12), indicating that most dimensions of home culture are highly correlated with SES.

Adding home culture indices to the production function does not substantially diminish other relationships, however. This suggests that the home culture measures are bringing new, independent information to the production function. At the same time, their omission does not seem to strongly bias the coefficients of the usual variables of interest (see Table A1), which is a reassuring result for researchers using data without such measures.

4.2.5 Joint estimation of the four indices

As described above, the empirical analysis started out by including the indices in *separate* regressions due to suspicions that the four dimensions of home culture are correlated. Table 4.4 confirms that this is indeed the case: the correlation is highest between cultural and social communication and between cultural communication and possessions (about 0.40), while correlations between the remaining pairs of variables are roughly half that size.

Table 4.4 Correlation coefficients between the four dimensions of home culture

| | Cultural communication | Social communication | Home educ. resources | Cultural possessions |
|----------------------------|------------------------|----------------------|----------------------|----------------------|
| Cultural communication | 1 | | | |
| Social communication | 0,43 | 1 | | |
| Home educational resources | 0,17 | 0,20 | 1 | |
| Cultural possessions | 0,39 | 0,19 | 0,23 | 1 |

¹⁶ This warrants a more in-detail analysis: Gender differences in single items are significant only for books of poetry (22% of boys and 34% of girls). This difference is large and one can only speculate about its sources. Maybe girls are more interested in poetry and are therefore more aware of that they actually have such books in their home. Perhaps they have bought them for their personal use, which might explain why their brothers do not know about them.

In this next section, I conclude the analysis of home culture by entering all four indices *jointly* in the regression. Results of the joint estimation of all four factors of home culture are reported in the lower panel of Table 4.3. Including all factors jointly in a model substantially reduces the estimated coefficient sizes of most estimates. Yet, when SES is not controlled for, only social communication turns insignificant. In a model with controls included, the estimate for cultural possessions is insignificant, too. Thus, when entering all four indices simultaneously, the results suggest that most of the impact on test scores comes from cultural communication. Also, including the four indices jointly does not add to the explanatory power compared with a model, where only cultural communication is included ($R^2=0.12$ in both cases). These results suggest that among the four dimensions of home culture, cultural communication has the single strongest correlation with test scores.

4.3 Parental involvement and attitudes

Apart from information on home culture, student questionnaires also give information on other dimensions of parenthood that might be informative of their involvement with school and their attitudes towards school or integration related issues. Also these dimensions are possibly related to their children's test scores. In this section, I consider issues like the language spoken at home, participation in mother-tongue lessons, leisure-time activities (participation in organised leisure activities or time spent in paid work), help with schoolwork, missing school and the student composition at school.

4.3.1 Language spoken at home

When students speak Danish at home most of the time, this may be a sign of greater integration in the host society, and may promote students' proficiency of Danish, leading to higher reading test scores. Table 4.5, column 1, shows the frequency with which students in different subsamples speak Danish in their homes. Only 20% of immigrant students speak mostly Danish at home; 16% of the first generation immigrants and 23% of the second generation. Interestingly, more girls than boys speak Danish at home (23% vs. 17%). Contrary to what one might expect, the propensity to speak Danish at home does not differ significantly by parental education, occupation or income. There is a tendency for students in nuclear families to be more likely to speak another language than Danish. Students from Lebanon speak Danish at lower rates than the other immigrant groups (8% vs. 16-24%). In an international comparison, in Denmark, immigrants speak the host country language at much lower rates than in other countries (Schnepf 2007).

Results on a multiple regression analysis of test scores on the language spoken at home are reported in Table 4.5, lower panel. Speaking Danish at home is associated with a 0.18 SD increase in reading scores in a regression without additional controls, and 0.13 SD in a regression where controls for SES are included. These impacts are of the same size as a one standard deviation increase in cultural communication index on reading scores, which was the highest among the four factors of home culture.

Table 4.5 Results for language at home, mother-tongue teaching, leisure activities and paid work

| | Speak Danish at home | Mother-tongue teaching | No | Organised leisure activities | | | No | Paid work | | |
|--------------------------------|----------------------|------------------------|-----|------------------------------|--------------------|-------------------------|-----|-------------------------|--------------------|-------------------------|
| | | | | Less than 4 hours/ week | 5 or 6 hours/ week | More than 7 hours/ week | | Less than 4 hours/ week | 5 or 6 hours/ week | More than 7 hours/ week |
| All | 20% | 59% | 31% | 66% | 14% | 20% | 44% | 64% | 9% | 27% |
| Boys | 17% | 57% | 18% | 53% | 16% | 31% | 37% | 59% | 10% | 31% |
| Girls | 23% | 61% | 41% | 79% | 12% | 9% | 51% | 67% | 9% | 24% |
| <i>Mother's education:</i> | | | | | | | | | | |
| Max compulsory schooling | 19% | 62% | 33% | 66% | 14% | 20% | 48% | 65% | 9% | 26% |
| More than compulsory schooling | 22% | 55% | 26% | 66% | 15% | 19% | 39% | 61% | 10% | 28% |
| <i>Father's education:</i> | | | | | | | | | | |
| Max compulsory schooling | 20% | 62% | 31% | 67% | 14% | 19% | 47% | 66% | 9% | 25% |
| More than compulsory schooling | 20% | 58% | 30% | 65% | 15% | 21% | 43% | 62% | 9% | 29% |
| Nuclear family | 19% | 62% | 30% | 66% | 15% | 19% | 52% | 63% | 9% | 27% |
| Not nuclear family | 24% | 53% | 34% | 64% | 13% | 24% | 57% | 64% | 10% | 26% |
| Max 2 siblings | 21% | 58% | 30% | 67% | 14% | 20% | 58% | 62% | 10% | 29% |
| More than 2 siblings | 18% | 61% | 31% | 65% | 16% | 19% | 49% | 68% | 9% | 23% |
| Low occupational status | 20% | 55% | - | 45% | 21% | 34% | - | 59% | 15% | 25% |
| High occupational status | 22% | 56% | - | 45% | 23% | 31% | - | 58% | 16% | 26% |
| Low income | 20% | 58% | 32% | 77% | 11% | 12% | 45% | 67% | 5% | 27% |
| High income | 18% | 63% | 28% | 76% | 10% | 13% | 43% | 66% | 6% | 28% |
| Both parents in job | 25% | 59% | 29% | 64% | 15% | 21% | 43% | 62% | 9% | 29% |
| No parent in job | 15% | 61% | 30% | 66% | 15% | 19% | 43% | 64% | 9% | 27% |
| Only father in job | 16% | 65% | 31% | 66% | 14% | 20% | 45% | 66% | 9% | 26% |
| Only mother in job | 27% | 60% | 29% | 62% | 15% | 23% | 45% | 65% | 10% | 25% |
| <i>Country of origin:</i> | | | | | | | | | | |
| Turkey | 24% | 59% | 29% | 65% | 14% | 21% | 40% | 63% | 10% | 26% |
| Ex-Yugoslavia | 17% | 45% | 34% | 68% | 14% | 19% | 33% | 55% | 10% | 35% |
| Pakistan | 16% | 79% | 42% | 66% | 17% | 17% | 59% | 70% | 11% | 20% |
| Lebanon | 8% | 69% | 26% | 64% | 14% | 22% | 47% | 63% | 9% | 29% |
| First generation immigrant | 16% | 53% | 31% | 67% | 14% | 19% | 43% | 61% | 9% | 30% |
| Second generation immigrant | 23% | 64% | 30% | 65% | 15% | 21% | 46% | 65% | 10% | 25% |

| | Speak Danish at home | Mother-tongue teaching | No | Organised leisure activities | | | No | Paid work | | |
|-----------------------------|----------------------|------------------------|-------|------------------------------|--------------------|-------------------------|---------------|-------------------------|--------------------|-------------------------|
| | | | | Less than 4 hours/ week | 5 or 6 hours/ week | More than 7 hours/ week | | Less than 4 hours/ week | 5 or 6 hours/ week | More than 7 hours/ week |
| Regression results | | | | | | | | | | |
| <i>Without SES-controls</i> | | | | | | | | | | |
| Coef | 17,89 | 6,60 | 12,3 | | 7,14 | -4,77 | -10,25 | | 0,65 | -5,91 |
| Se | 6,18 | 4,96 | 6,79 | <i>Ref.</i> | 7,21 | 6,3 | 3,75 | <i>Ref.</i> | 8,98 | 5,93 |
| Adj. R-sq | 0,02 | 0,00 | 0,002 | | 0,001 | | 0,001 | | | 0,00 |
| <i>With SES-controls</i> | | | | | | | | | | |
| Coef | 13,11 | 5,76 | 7,72 | | 5,99 | -0,35 | -11,55 | | 2,03 | -3,88 |
| Se | 6,00 | 4,80 | 6,77 | <i>Ref.</i> | 7,10 | 6,47 | 5,87 | <i>Ref.</i> | 8,75 | 5,73 |
| Adj. R-sq | 0,11 | 0,09 | 0,08 | | 0,09 | 0,09 | 0,10 | | | 0,09 |

4.3.2 Participation in mother-tongue lessons

Students have been asked whether they have (ever) participated in mother-tongue classes organised by the school authorities in their municipality. Mother-tongue teaching is offered for two reasons: to enable the child to keep and develop the language of his/her country of origin, and as an additional basis on which to build the acquisition of Danish as the child's second language.

In all, almost 60% of all immigrants in our sample have attended mother-tongue lessons at some point of time during their compulsory school years (Table 4.5, column 2). Generally, there seems to be a slight tendency for children from lower educated parents to attend mother-tongue lessons at higher rates. There are no significant differences by gender, parental occupation, income or labour-market participation. Students in nuclear families are more likely to attend mother-tongue lessons, as are, perhaps surprisingly, students born in Denmark (second generation). Important differences occur in the rates of participation by country of origin: with an attendance rate of almost 80%, Pakistanis are the most eager, while only 45% of Ex-Yugoslavians attend. Moreover (not shown in the table), even among those students who speak mostly Danish at home, 50% attend mother-tongue lessons.

Results on a multiple regression analysis of test scores on mother-tongue lessons are reported in Table 4.5, column 2 in the lower panel. Attending mother-tongue lessons is not significantly associated with reading scores in a regression, neither with nor without additional controls.

4.3.3 Organised leisure activities and paid job

What students do after school might also impact their academic skills. Language skills might be enhanced by talking to other youngsters in sporting clubs, playing in an orchestra, or when having a job after school in a supermarket. On the other hand, when parents allow their children to engage in such activities, this might also be merely a signal that the family is more integrated into the host society, such that any observed association between participating in these activities and higher test scores might be spurious. Unfortunately, only the PISA-Ethnic questionnaire has appropriate response categories to separate in organised leisure activities or paid work from participation up to four hours a week. The following results on non-participation are therefore based on the PISA-Ethnic subsample alone. It is found that 31% do not engage in organised leisure activities at all¹⁷, 35% spend up to four hours a week in organised leisure activities, 14% spend 5 or 6 hours, while the remaining 20% spend more than that. Table 4.5 reports frequencies for participation in organised leisure activities and time spent in paid work. While more than 80% of boys engage in organised leisure activities, only 60% of girls do. Likewise, roughly 60% of boys and 50% of girls have ever had a job. Boys also spend more hours engaging in organised leisure activities and on a job than girls (the gender gap is larger for leisure activities than for jobs). Mother's education influences students' propensity to engage in organised leisure activities and paid job: while 33% and 48% of students with low educated mothers do not engage in organised leisure activities and a paid job, only 26% and 39% of students with mothers with more than compulsory schooling do not. Ex-Yugoslavians participate less in leisure activities, while Pakistanis less often take up paid work. Ex-Yugoslavians spend more time on paid work than their reference category

¹⁷ The results for how many students do not participate (both in organised leisure activities and paid job) at all are based on the PISA-Ethnic subsample alone, because PISA-Copenhagen did not have this category in its student questionnaire (up to four hours was the minimum category) – and the questions were not asked at all in the PISA-2000 study.

(Turks), while there is no difference between countries of origin for time spent on leisure activities. There are no significant differences by family structure, father's education, occupation, income and immigrant generation, but having more than two siblings increases participation in the job market, while decreasing the number of hours worked. Neither time spent in organised leisure activities nor time on job is associated with reading test scores, though (see Table 4.5, lower panel). Yet, when I look at participation (yes/no), having ever had a job is significantly associated with higher reading scores, while the correlation with participation (yes/no) in organised leisure activities is not significant.

4.3.4 Help with schoolwork

Students have been asked how often they receive help from their mother and father with their schoolwork. Table 4.6 illustrates the frequency with which parents help their children. Roughly 40% of immigrant students never or only rarely receive help from their parents¹⁸, and another roughly 40% get help only once in a while. Only 20% of immigrant students are helped regularly by both parents, i.e. several times a month at least.

Differences in how often students are helped by their parents are evident by parental education (in particular, mother's education), family structure, and parental occupation, but not by income, see Table 4.6. While about 40% of students with low educated mothers never or only rarely receive any help, only 30% of students with mothers with more than compulsory schooling do; the same numbers apply for low and high occupational status, respectively. Also, almost 50% of students in non-nuclear families do not receive any help, but only 35% of students in two-parent families. There are no significant differences by country of origin. Fewer second generation immigrants never receive any help and more are helped more than a few times a year/once a month. When no parent has a job, children are helped less regularly than when both parents have a job.

Perhaps surprisingly, the frequency of being helped with schoolwork by parents is negatively related to test score (Table 4.6, lower panel). When parental help with schoolwork is included as a set of dummy variables to describe the frequency of being helped, the results show that only the highest category, i.e. being helped several times a week, is associated with lower test scores compared to not or rarely being helped.

The pattern of estimates including and excluding SES shows that the absolute size of the negative coefficient is larger when SES is included. This means that in the regression without SES, there are at least two processes at work: on the one hand, students who do not do well are helped more (driving the coefficient towards a negative sign), and on the other hand, students with higher educated parents are helped more often, which drives the coefficient into a positive direction, when parental education is not controlled for. Once parental education is included in the model, the effect driving the estimate towards a positive sign is eliminated, which is mirrored in a decrease of the estimate size by about 70%. Thus, since I would not believe that it is frequent parental help that is causing low achievement, I would tend to conclude that while causality may run in both directions, the effect that low achievement causes parents to help more seems to dominate. Yet, without a more stringent model setup, i.e. prior test scores, I cannot investigate this any further.

¹⁸ This is the case for only 16% of Danes.

Table 4.6 Results for help with school work, missing school and immigrant concentration at school

| | Help with school work (parents) | | | Miss school (last 2 weeks) | | | Percentage immigrants in school | | | |
|--------------------------------|------------------------------------|--|----------------------------------|-------------------------------|-----------------|--------------------|---------------------------------|--------|--------|---------|
| | Never | A few times a year /once a month | Several times a month/week | Not once | 1 or 2 times | 3 times or more | 0-10% | 10-25% | 25-50% | 50-100% |
| All | 38% | 42% | 20% | 64% | 27% | 9% | 6% | 20% | 28% | 46% |
| Boys | 40% | 40% | 20% | 69% | 24% | 7% | 6% | 21% | 29% | 45% |
| Girls | 37% | 43% | 20% | 60% | 29% | 11% | 5% | 19% | 29% | 48% |
| <i>Mother's education:</i> | | | | | | | | | | |
| Max compulsory schooling | 42% | 40% | 18% | 63% | 28% | 9% | 4% | 18% | 29% | 50% |
| More than compulsory schooling | 32% | 45% | 22% | 66% | 25% | 9% | 8% | 23% | 26% | 42% |
| <i>Father's education:</i> | | | | | | | | | | |
| Max compulsory schooling | 40% | 41% | 19% | 65% | 26% | 10% | 4% | 18% | 27% | 51% |
| More than compulsory schooling | 36% | 43% | 21% | 65% | 28% | 8% | 6% | 22% | 29% | 44% |
| Nuclear family | 35% | 44% | 21% | 59% | 28% | 12% | 5% | 19% | 29% | 47% |
| Not nuclear family | 46% | 38% | 17% | 66% | 26% | 8% | 8% | 22% | 24% | 46% |
| Max 2 siblings | 39% | 42% | 19% | 65% | 26% | 9% | 6% | 21% | 30% | 43% |
| More than 2 siblings | 37% | 41% | 22% | 63% | 27% | 10% | 4% | 17% | 23% | 56% |
| Low occupational status | 42% | 38% | 20% | 61% | 25% | 14% | 8% | 20% | 22% | 50% |
| High occupational status | 31% | 45% | 24% | 60% | 32% | 8% | 11% | 27% | 22% | 40% |
| Low income | 38% | 41% | 21% | 65% | 26% | 9% | 3% | 20% | 32% | 46% |
| High income | 35% | 47% | 18% | 69% | 25% | 6% | 5% | 18% | 34% | 44% |
| Both parents in job | 33% | 45% | 22% | 69% | 23% | 8% | 8% | 23% | 27% | 42% |
| No parent in job | 42% | 40% | 19% | 64% | 28% | 9% | 4% | 19% | 25% | 52% |
| Only father in job | 38% | 43% | 19% | 64% | 28% | 8% | 4% | 17% | 29% | 51% |
| Only mother in job | 32% | 45% | 23% | 63% | 25% | 12% | 7% | 19% | 35% | 39% |
| <i>Country of origin:</i> | | | | | | | | | | |
| Turkey | 39% | 41% | 20% | 61% | 29% | 10% | 5% | 18% | 32% | 44% |
| Ex-Yugoslavia | 33% | 43% | 23% | 60% | 30% | 10% | 9% | 24% | 22% | 45% |
| Pakistan | 39% | 47% | 14% | 72% | 25% | 4% | 2% | 21% | 24% | 54% |
| Lebanon | 39% | 36% | 25% | 66% | 28% | 6% | 3% | 21% | 20% | 56% |
| First generation immigrant | 40% | 39% | 21% | 67% | 26% | 7% | 8% | 24% | 27% | 42% |
| Second generation immigrant | 37% | 45% | 19% | 61% | 28% | 11% | 4% | 17% | 28% | 51% |

| | Help with school work (parents) | | | Miss school (last 2 weeks) | | | Percentage immigrants in school | | | |
|-----------------------------|------------------------------------|--|----------------------------------|-------------------------------|-----------------|--------------------|---------------------------------|---------------|---------------|---------------|
| | Never | A few times a year /once a month | Several times a month/week | Not once | 1 or 2 times | 3 times or more | 0-10% | 10-25% | 25-50% | 50-100% |
| Regression results | | | | | | | | | | |
| <i>Without SES-controls</i> | | | | | | | | | | |
| Coef | | 11,42 | -13,94 | | -23,79 | -48,42 | | -22,38 | -30,31 | -48,04 |
| Se | <i>Ref.</i> | 5,16 | 6,38 | <i>Ref.</i> | 5,23 | 8,13 | <i>Ref.</i> | 10,78 | 10,45 | 10,09 |
| Adj. R-sq | | 0,01 | | | 0,03 | | | | 0,02 | |
| <i>With SES-controls</i> | | | | | | | | | | |
| Coef | | 3,66 | -19,84 | | -24,40 | -43,42 | | -17,04 | -26,57 | -38,91 |
| Se | <i>Ref.</i> | 5,01 | 6,22 | | 5,05 | 7,91 | <i>Ref.</i> | 10,41 | 10,17 | 9,86 |
| Adj. R-sq | | 0,10 | | | 0,13 | | | | 0,10 | |

4.3.5 Missing school

Students have been asked, how many times they missed school with their parents' acceptance/knowledge during the last two weeks of school. Parental acceptance of their child missing school may be an indicator of how high a priority education has in students' homes. Also, of course, frequent absence from school may hinder learning. Two out of three students answer that they have not missed school during the last four weeks, while one out of four has missed one or two days of school. 9% have missed three or more days of school (Table 4.6). Interestingly, girls miss school more than boys, and students from nuclear families miss school less often than students who do not live with both parents as do students whose parents belong to the 50% with lowest occupational status. Pakistani students miss school less often than students from the other three countries of origin.

As expected, missing school is negatively related to test scores (Table 4.6, lower part)¹⁹. A dummy-specification of the variable of interest shows that missing school once or twice out of two weeks decreases test scores by 0.24 SD, while missing three or more schooldays is related to a test score decrease in the order of 0.50 SD.

4.3.6 Ethnic school composition

As a last dimension of parental involvement and attitudes, I consider the immigrant concentration in the child's school. Since parents have some degree of school choice, they implicitly (or explicitly) choose the ethnic concentration as one dimension of school choice – either directly by choosing school or indirectly by residential choice. I have grouped all schools into four categories, delineated by the percentage of immigrant children in the school. Table 4.6 shows the distribution of students across these four categories of immigrant concentration. 6% of the students in our sample attend schools without important shares of immigrant students (0-10%), 20% attend schools with 10-25% immigrants, 28% with 25-50% immigrants and the remaining 46% attend schools with a majority of immigrant students. The high percentage of students attending immigrant-majority schools is of course partly due to the sampling scheme: in Copenhagen, schools are polarised (60% of immigrant students attend immigrant-majority schools in the PISA-Copenhagen subsample) and PISA-Ethnic directly samples students from schools with high immigrant concentrations (46% of students in this sample attend immigrant-majority schools). The only subsample being drawn representatively from all schools is the PISA-2000 sample. In this sample, only 10% of immigrant students attend immigrant-majority schools, while 25% attend schools with only up to 10% immigrants.

There are differences by parental education in the immigrant concentration in a child's school (42% and 50% of students with high vs. low educated mothers attend immigrant majority schools and similarly for father's education) and occupational status (40% and 50% for high and low status, respectively), Table 4.6. Also, students with more siblings and with mothers who are not working tend to attend schools with more immigrant students. Students from Ex-Yugoslavia attend schools with lower concentrations than students from the other three countries. Contrary to what one might expect, second generation students attend immigrant majority schools at higher rates than the first generation. This may partly be due to an

¹⁹ There is a mistake in the 2000 PISA-questionnaire for Denmark: instead of asking about absence during the last two weeks of school, the period asked about was four weeks. When the estimation is rerun without PISA2000 students, the results hardly change.

immigrant dispersion policy for refugees, which aimed at promoting better integration of refugees by means of geographic dispersal of refugees.

When I regress the school composition categories on reading scores, I find a negative association between the percentage of immigrant students in the child's school and reading scores (Table 4.6, lower panel). When differences in SES are controlled for, the coefficients are reduced, but for two highest categories, *25-50%* and *more than 50%*, the estimates stay negative and significant. Thus, controlling for selection by SES into schools with different immigrant shares, more immigrants are associated with lower reading scores for immigrant students when the immigrant percentage exceeds 25% (by 0.27 SD). For immigrant majority schools, the disadvantage is even larger (0.39 SD) compared to schools with very few immigrants (0-10%).

Yet, the existing empirical literature on this issue for Denmark is ambiguous about at what point of immigrant concentration student achievement starts to fall²⁰. Thus, while there is no doubt that high immigrant percentages harm academic achievement, it is not clear *where* the turning point of immigrant concentration after which performance starts to deteriorate is located.

Also, Rangvid (2008) shows that it is probably another – yet closely correlated – dimension of peer quality that is the key for student achievement. When average parental education of the peers in school is added to a model including the immigrant concentration in the schools (and the usual battery of student and family controls), the estimate of the immigrant concentration decreases substantially and turn insignificant suggesting that the socioeconomic composition of schools might be more important than the ethnic composition.

4.4 Checking the robustness of the estimates

4.4.1 Including immigration-specific variables

A material issue of relevance in interpreting the estimated impact of home culture, parental involvement and attitudes over and above the effect of socioeconomic dimensions, is the ability to fully control for differences in students' socioeconomic status. In the regressions above, I included the usual suspects regarding socioeconomic dimensions as controls in the estimations. Yet, one might argue that whether the student was born in Denmark or immigrated (as a child) and the country of origin also might be proxies for observed and unobserved differences that are exogenous. However, they might be correlated with measures of student home background. If this is so, not including these variables might lead to over- or underestimated coefficients on the variables of interest. Therefore, as a robustness check, I present results from regressions which include these variables as additional controls. For comparison, I also include the results from the main analysis in section 4.2 in Table 4.7 (column 1).

²⁰ Jensen & Smith (2008); Jensen & Rasmussen (2008); DØRS (2007); Rangvid (2006).

Table 4.7 Results from regressions including immigrant-specific variables and school fixed effect

| | With SES | | | With SES + IM-specific | | | With SES + SFE | | |
|---|----------|----------|---------|------------------------|----------|---------|----------------|----------|---------|
| | (1) | | | (2) | | | (3) | | |
| | Robust | | | Robust | | | Robust | | |
| | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 |
| Cultural communication | 13,1 | 2,3 | 0,12 | 12,9 | 2,3 | 0,14 | 10,5 | 2,4 | 0,20 |
| Social communication | 6,8 | 1,9 | 0,10 | 7,1 | 1,9 | 0,12 | 7,0 | 1,9 | 0,19 |
| Home educational resources | 6,6 | 2,1 | 0,10 | 6,2 | 2,0 | 0,12 | 5,0 | 2,1 | 0,18 |
| Cultural possessions | 8,8 | 2,6 | 0,10 | 8,9 | 2,6 | 0,12 | 7,8 | 2,7 | 0,18 |
| Joint estimation | | | | | | | | | |
| Cultural communication | 10,7 | 2,5 | | 10,3 | 2,5 | | 7,7 | 2,6 | |
| Social communication | 2,0 | 2,0 | 0,12 | 2,4 | 2,0 | 0,14 | 3,5 | 2,1 | 0,20 |
| Home educational resources | 4,5 | 2,1 | | 4,0 | 2,1 | | 2,8 | 2,2 | |
| Cultural possessions | 3,6 | 2,7 | | 3,8 | 2,7 | | 3,5 | 2,8 | |
| Speak Danish at home | 13,1 | 6,0 | 0,11 | 8,5 | 6,0 | 0,13 | 10,4 | 6,3 | 0,19 |
| Mother-tongue lessons | 5,8 | 4,8 | 0,09 | 4,7 | 4,8 | 0,11 | 6,8 | 4,9 | 0,18 |
| Org. leisure activities | 0,4 | 3,2 | 0,09 | 0,6 | 3,2 | 0,11 | 2,2 | 3,2 | 0,18 |
| Paid job | -1,8 | 2,8 | 0,09 | -0,9 | 2,8 | 0,11 | -0,4 | 2,9 | 0,18 |
| Help schoolwork | -6,2 | 1,8 | 0,11 | -5,9 | 1,8 | 0,13 | -5,3 | 1,8 | 0,19 |
| Miss school | -22,7 | 3,4 | 0,12 | -21,4 | 3,4 | 0,13 | -22,7 | 3,6 | 0,20 |
| <i>Percentage immigrants in school:</i> | | | | | | | | | |
| 0-10% | - | - | | - | - | | - | - | |
| 10-25% | -17,0 | 10,4 | 0,10 | -21,5 | 10,4 | 0,12 | - | - | - |
| 25-50% | -26,6 | 10,2 | | -32,6 | 10,2 | | - | - | |
| 50-100% | -38,9 | 9,9 | | -43,5 | 9,9 | | - | - | |

Generally, the results show that the coefficients for the home culture indicators hardly change when I add immigrant generation and country of origin as controls²¹. Only the coefficient for speaking mainly Danish at home falls noticeable by 28% and is now only marginally significant, indicating that immigrant generation or country of origin (or both) is correlated with speaking Danish at home. Thus, the significant association between speaking Danish and reading scores is at least partly due to the fact that second generation immigrants do better in the reading test, and they also speak more Danish at home, since e.g. students from Lebanon underperform compared to the immigrant average and also have a low propensity to speak Danish at home. Also, when including immigrant characteristics, the association between attending a school with 10-25% immigrant student increases and is now marginally significant.

4.4.2 School fixed effects

Above, it was argued that which school to attend is a choice variable for parents. Thus, I would expect that parents with different home culture, involvement and attitudes and SES choose different schools, i.e. that these dimensions are correlated. If which school they attend matters for students' reading scores, and home culture and these school (fixed) effects are correlated, omitting school fixed effects from the regression might bias the estimates on home culture (and SES). To be safe, I present results on regressions taking account of school fixed effects as a robustness check. Including school fixed effects allow me to remove any observable as well as unobservable effects that are fixed within schools. In particular, as we saw above, the ethnic student composition in schools attended differs by parental education, immigrant generation and country of origin. This suggests systematic differences between schools attended by different groups of immigrants. This might affect reading scores if peer effects matter. The following school fixed effects estimations control for such systematic differences.

The coefficient estimates for home culture and the parental involvement and attitudes indicators from a regression including socioeconomic characteristics and school fixed effects are reported in Table 4.7, column 3²².

The pattern shows that, as one would expect, including school fixed effects reduces the estimates for most (significant) home culture indicators. This suggests that schools frequented by immigrants with lower levels of home culture, parental involvement and attitudes are less conducive to academic achievement than schools frequented by immigrants with higher levels of home culture. Moreover, adding school fixed effects adds substantial explanatory power to the model: adjusted R-sq is at least twice as large as in the model with SES controls alone.

²¹ I include indicator variables for the ten countries of origin with the largest number of observations in the dataset. These are Turkey, Lebanon, Ex-Yugoslavia, Morocco, Somalia, Iraq, Pakistan, Vietnam, Afghanistan and Iran. The remaining observations are gathered in a residual group.

²² Due to perfect collinearity, we cannot include the percentage of immigrant students in the school together with school fixed effects.

Table 4.8 Regression results for math and science test scores

| | MATH | | | | | | | | | SCIENCE | | | | | | | | | |
|--|--------------|----------|---------|------------------------|----------|---------|----------------|----------|---------|--------------|----------|---------|------------------------|----------|---------|----------------|----------|---------|--|
| | With SES | | | With SES + IM-specific | | | With SES + SFE | | | With SES | | | With SES + IM-specific | | | With SES + SFE | | | |
| | (1) | | | (2) | | | (3) | | | (1) | | | (2) | | | (3) | | | |
| | Robust | | | Robust | | | Robust | | | Robust | | | Robust | | | Robust | | | |
| | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | |
| Cultural communication | 12,5 | 3,0 | 0,11 | 12,6 | 3,0 | 0,11 | 13,0 | 3,1 | 0,19 | 6,2 | 3,2 | 0,06 | 6,1 | 3,2 | 0,06 | 3,8 | 3,5 | 0,11 | |
| Social communication | 5,8 | 2,4 | 0,09 | 5,8 | 2,4 | 0,09 | 5,4 | 2,6 | 0,17 | 3,2 | 2,6 | 0,05 | 3,4 | 2,7 | 0,06 | 3,2 | 2,9 | 0,11 | |
| Home educational resources | 7,1 | 2,6 | 0,09 | 6,9 | 2,6 | 0,09 | 6,0 | 2,9 | 0,16 | 5,3 | 2,9 | 0,05 | 5,0 | 2,9 | 0,06 | 5,1 | 3,2 | 0,11 | |
| Cultural possessions | 12,5 | 3,3 | 0,09 | 12,7 | 3,3 | 0,10 | 12,8 | 3,6 | 0,17 | 9,9 | 3,6 | 0,06 | 10,0 | 3,6 | 0,07 | 9,8 | 4,0 | 0,11 | |
| Joint estimation | | | | | | | | | | | | | | | | | | | |
| Cultural communication | 9,7 | 3,4 | 0,11 | 9,8 | 3,4 | 0,12 | 11,1 | 3,6 | 0,19 | 4,0 | 3,5 | 0,06 | 3,8 | 3,5 | 0,07 | 1,1 | 3,9 | 0,11 | |
| Social communication | 0,0 | 2,7 | | 0,0 | 2,7 | | -0,7 | 2,9 | | 0,2 | 2,9 | | 0,4 | 2,9 | | 1,1 | 3,1 | | |
| Home educational resources | 5,0 | 2,7 | | 4,9 | 2,7 | | 4,7 | 2,9 | | 3,8 | 3,0 | | 3,5 | 3,0 | | 3,4 | 3,3 | | |
| Cultural possessions | 7,6 | 3,4 | | 7,9 | 3,4 | | 7,3 | 3,8 | | 6,7 | 3,8 | | 6,9 | 3,8 | | 7,5 | 4,2 | | |
| Speak Danish at home | 18,6 | 7,9 | 0,09 | 16,1 | 7,9 | 0,10 | 9,4 | 8,7 | 0,16 | 12,9 | 8,2 | 0,05 | 9,9 | 8,3 | 0,06 | 9,0 | 9,2 | 0,11 | |
| Mother-tongue lessons | -1,6 | 6,3 | 0,08 | -3,8 | 6,4 | 0,08 | -7,5 | 6,7 | 0,16 | 5,7 | 6,7 | 0,05 | 6,4 | 6,8 | 0,06 | 16,3 | 7,4 | 0,11 | |
| Org. leisure activities | 1,4 | 4,1 | 0,08 | 1,1 | 4,2 | 0,08 | 2,8 | 4,5 | 0,17 | 0,2 | 4,6 | 0,05 | 0,6 | 4,6 | 0,06 | -1,3 | 5,0 | 0,11 | |
| Paid job | 1,3 | 3,7 | 0,08 | 2,2 | 3,7 | 0,08 | 0,6 | 3,9 | 0,16 | -0,7 | 4,1 | 0,05 | 0,1 | 4,0 | 0,06 | -1,8 | 4,4 | 0,11 | |
| Help schoolwork | -4,0 | 2,3 | 0,10 | -3,6 | 2,3 | 0,10 | -4,2 | 2,5 | 0,18 | -4,1 | 2,5 | 0,06 | -4,1 | 2,5 | 0,06 | -4,9 | 2,8 | 0,08 | |
| Miss school | -14,8 | 4,5 | 0,09 | -13,8 | 4,5 | 0,10 | -11,9 | 5,1 | 0,16 | -19,4 | 4,8 | 0,06 | -18,6 | 4,8 | 0,07 | -24,8 | 5,4 | 0,13 | |
| <i>Percentage immigrants in school*:</i> | | | | | | | | | | | | | | | | | | | |
| 10-25% | -23,4 | 13,4 | 0,08 | -25,0 | 13,4 | 0,09 | - | - | - | -18,9 | 15,1 | 0,07 | -19,8 | 15,1 | 0,07 | - | - | - | |
| 25-50% | -25,0 | 13,0 | | -28,2 | 13,1 | | - | - | | -31,1 | 14,9 | | -34,0 | 15,0 | | - | - | | |
| 50-100% | -39,3 | 12,6 | | -42,4 | 12,6 | | - | - | | -48,8 | 14,5 | | -49,2 | 14,4 | | - | - | | |

4.4.3 Math and science results: suggestive evidence

The relevant reading sample to compare to the math sample is not the full sample used above, but only those students who have been tested in both subjects. Therefore, as a robustness check, I present results for reading test scores for two subsamples (Table A2 in the appendix): the math sample and the science sample (i.e. only students, who have also been tested in math/science). The general picture is the same as in the full reading sample, no matter whether regressions are run on the full sample or either subsample: of the home culture indicators, cultural communication has the most convincing impact on reading scores (at least in the joint estimation)²³ help with schoolwork and missing school has generally a negative and significant association with reading scores and having an immigrant percentage in schools of 10-25% is just on the verge of being significant at the 5% level compared to the reference category of 0-10%, while the estimates for immigrant percentages of more than 25%, and in particular above 50%, are large and highly significant. Thus, we can safely conclude that the math and science subsamples are not systematically different.

Table 4.8 shows regression results for math and science scores. The model explains a similar share of the total variation in math scores as it does for reading scores (about 20% when school fixed effects are included), while the amount explained is much lower for science scores. Just as for reading scores, in the joint estimation, cultural communication is the strongest predictor of math scores of the four home culture indicators, while this is not the case for science scores. Cultural possessions turn out to be more important for math and science scores than for reading scores, but are only marginally significant. Also for math and science, missing school is negatively related to test scores, but for math scores, this effect is only half the size as for reading and science. For both math and science scores, results for the percentage of immigrant students are similar to those for reading scores.

4.5 Discussion and conclusion

This study is an exploratory investigation of the roles of home culture and parental involvement and attitudes for immigrant students' test scores. The results indicate that among the four dimensions of home culture, cultural communication is closest related to higher reading and math scores, while none of the four dimensions is convincingly related to science scores. When included one at a time, the other three dimensions of home culture are significantly related to reading and math scores, though, indicating that the high correlation between some of the home culture dimensions makes it difficult to single out isolated effects.

Frequent parental help with schoolwork and frequently missing school are generally negatively related to test scores, but the direction of causation is ambiguous. The percentage of immigrant peers in the school is negatively related to test scores in all subjects. The remaining factors of parental involvement and attitudes examined here, such as language at home, participation in mother-tongue lessons and leisure activities cannot be shown to be consistently related to test scores, while (ever) having had a paid job is related to higher reading scores.

These results point at the importance of home culture, and in particular the cultural dimension. Parents engaging in discussions, not only about everyday life, but more sophisticated, cultural issues frequently with their children are crucial for students' academic competencies.

²³ Yet, the coefficient is not significant for the science sample, model (3).

5 References

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6 Dansk sammenfatning

Dette arbejdspapir undersøger, hvilken rolle en række indikatorer for hjemmekultur samt forældrenes engagement og holdninger til barnets uddannelse og integration spiller for indvandrelevers boglige færdigheder (målt ved PISA-testene).

Resultaterne viser, at i blandt de fire forskellige dimensioner af hjemmekultur er det kulturel kommunikation, der betyder mest for niveauet i læsning og matematik. For eksempel får indvandrerbørn (med en gennemsnitlig social baggrund), der næsten aldrig taler om kulturelle emner derhjemme, kun 380 point i læsetesten, mens ellers socialt lignende indvandrerbørn, der af og til taler om kulturelle emner med deres forældre, scorer 20-30 point højere. Og børn, der ofte taler med deres forældre om kulturelle emner, scorer hele 35-50 point højere.

Derimod findes der for ingen af de fire dimensioner en overbevisende sammenhæng med testscorer i naturvidenskab. Sammenhængen med testscorer for de tre øvrige dimensioner af hjemmekultur er svagere, og den forsvinder, når effekten af alle fire dimensioner vurderes samtidig.

Desuden er det at have prøvet at have et fritidsjob relateret til højere læsescorer, hvorimod elever, som har hyppige fravær fra skolen, eller som går i en skole med en høj indvandrerkoncentration, klarer sig dårligere i PISA-testene. De øvrige dimensioner af forældreengagement og -holdninger, der er undersøgt, såsom sprog talt i hjemmet, deltagelse i modersmålsundervisning og fritidsaktiviteter, samvarierer ikke systematisk med elevernes testscorer.

7 Appendix


Table A1 Full regression results with and without single dimensions of home culture

| | coef | se | coef | se | coef | se | coef | se | coef | se |
|---|---------------|-------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
| Cultural communication | | | 13,06 | 2,29 | | | | | | |
| Social communication | | | | | 6,85 | 1,86 | | | | |
| Home educational resources | | | | | | | 6,60 | 2,05 | | |
| Cultural possessions | | | | | | | | | 8,84 | 2,59 |
| Females | 18,59 | 4,57 | 16,11 | 4,52 | 16,44 | 4,56 | 18,32 | 4,56 | 17,48 | 4,57 |
| Years of education: father | 2,53 | 0,52 | 2,26 | 0,52 | 2,38 | 0,52 | 2,49 | 0,52 | 2,40 | 0,52 |
| Years of education: mother | 1,03 | 0,48 | 1,04 | 0,48 | 0,93 | 0,48 | 0,97 | 0,48 | 0,97 | 0,48 |
| Nuclear family | 9,47 | 5,65 | 8,32 | 5,58 | 7,02 | 5,65 | 8,86 | 5,64 | 10,04 | 5,64 |
| Number of siblings | -4,90 | 1,56 | -4,21 | 1,54 | -4,92 | 1,55 | -4,68 | 1,56 | -4,57 | 1,56 |
| Parental occupation | 0,52 | 0,22 | 0,39 | 0,22 | 0,50 | 0,22 | 0,50 | 0,22 | 0,42 | 0,22 |
| Parental income ('000 DKK) | 0,03 | 0,02 | 0,03 | 0,02 | 0,03 | 0,02 | 0,03 | 0,02 | 0,02 | 0,02 |
| <i>Father's labour-market status* (PISA2000 & PISA-Copenhagen samples):</i> | | | | | | | | | | |
| Full time | Reference | | | | | | | | | |
| Part time | -9,32 | 13,96 | -13,98 | 12,13 | -12,97 | 12,24 | -14,18 | 12,27 | -12,98 | 12,27 |
| Unemployed | 2,23 | 11,76 | -21,45 | 11,09 | -21,70 | 11,18 | -19,47 | 11,24 | -19,76 | 11,23 |
| Out of labour force | 9,26 | 8,85 | 1,85 | 8,46 | 3,40 | 8,53 | 3,98 | 8,56 | 5,32 | 8,57 |
| <i>Mother's labour-market status* (PISA2000 & PISA-Copenhagen samples):</i> | | | | | | | | | | |
| Full time | Reference | | | | | | | | | |
| Part time | -13,78 | 12,30 | -8,12 | 13,77 | -7,35 | 13,88 | -8,47 | 13,93 | -8,26 | 13,93 |
| Unemployed | -21,76 | 11,24 | 0,91 | 11,60 | 4,45 | 11,70 | 2,23 | 11,74 | 1,48 | 11,73 |
| Out of labour force | 3,32 | 8,58 | 8,53 | 8,73 | 8,87 | 8,80 | 8,67 | 8,84 | 9,72 | 8,83 |
| <i>Father's labour-market status** (PISA-ethnic sample):</i> | | | | | | | | | | |
| Self-employed | Reference | | | | | | | | | |
| High occupational status | 80,01 | 20,28 | 75,12 | 20,02 | 79,41 | 20,16 | 79,84 | 20,23 | 77,87 | 20,24 |
| Middle/low occupational status | 21,10 | 11,08 | 23,79 | 10,93 | 22,82 | 11,02 | 22,36 | 11,06 | 22,47 | 11,06 |
| Not working | 15,04 | 10,75 | 16,54 | 10,60 | 17,73 | 10,71 | 16,27 | 10,73 | 15,94 | 10,73 |
| <i>Mother's labour-market status** (PISA-ethnic sample):</i> | | | | | | | | | | |
| Self-employed | Reference | | | | | | | | | |
| High occupational status | 44,96 | 32,52 | 39,02 | 32,09 | 41,04 | 32,35 | 44,96 | 32,44 | 41,63 | 32,45 |
| Middle/low occupational status | -16,46 | 16,50 | -18,15 | 16,28 | -19,07 | 16,44 | -15,88 | 16,46 | -15,54 | 16,46 |
| Not working | -43,33 | 15,94 | -42,83 | 15,72 | -45,68 | 15,87 | -42,83 | 15,90 | -43,42 | 15,90 |
| Number of observations | 2047 | | 2047 | | 2047 | | 2047 | | 2047 | |
| Adj R-squared | 0,09 | | 0,12 | | 0,10 | | 0,10 | | 0,10 | |

* The category of reference is full time employment. ** The category of reference is self-employed.

Table A2 Reading scores results for the math and science subsamples

| | READ (Math sample) | | | | | | | | | READ (Science sample) | | | | | | | | | |
|--|-----------------------|----------|---------|------------------------|----------|---------|----------------|----------|---------|--------------------------|----------|---------|------------------------|----------|---------|----------------|----------|---------|--|
| | With SES | | | With SES + IM-specific | | | With SES + SFE | | | With SES | | | With SES + IM-specific | | | With SES + SFE | | | |
| | (1) | | | (2) | | | (3) | | | (1) | | | (2) | | | (3) | | | |
| | Robust | | | Robust | | | Robust | | | Robust | | | Robust | | | Robust | | | |
| | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | Coef. | Std. Err | Adj. R2 | |
| Cultural communication | 13,8 | 3,3 | 0,12 | 13,9 | 3,3 | 0,13 | 11,5 | 3,6 | 0,17 | 11,1 | 3,2 | 0,10 | 10,8 | 3,2 | 0,12 | 8,8 | 3,5 | 0,18 | |
| Social communication | 8,8 | 2,7 | 0,10 | 9,1 | 2,7 | 0,12 | 7,7 | 2,9 | 0,16 | 6,4 | 2,7 | 0,10 | 6,4 | 2,7 | 0,11 | 7,3 | 2,8 | 0,17 | |
| Home educational resources | 5,1 | 2,9 | 0,09 | 5,2 | 2,9 | 0,11 | 1,0 | 3,2 | 0,16 | 5,1 | 2,9 | 0,09 | 4,5 | 2,9 | 0,11 | 3,3 | 3,2 | 0,17 | |
| Cultural possessions | 5,6 | 3,7 | 0,09 | 6,0 | 3,7 | 0,11 | 6,3 | 4,1 | 0,16 | 8,8 | 3,6 | 0,09 | 9,0 | 3,6 | 0,11 | 6,9 | 4,0 | 0,17 | |
| Joint estimation | | | | | | | | | | | | | | | | | | | |
| Cultural communication | 11,3 | 3,8 | | 11,0 | 3,8 | | 8,5 | 4,1 | | 8,6 | 3,5 | | 8,2 | 3,5 | | 5,8 | 3,9 | | |
| Social communication | 4,1 | 3,0 | | 4,5 | 3,0 | | 4,6 | 3,3 | | 2,7 | 2,9 | | 2,8 | 2,9 | | 4,9 | 3,1 | | |
| Home educational re- sources | 2,9 | 3,0 | 0,12 | 2,9 | 3,0 | 0,14 | -0,8 | 3,3 | 0,17 | 2,8 | 3,0 | 0,10 | 2,2 | 3,0 | 0,12 | 0,9 | 3,3 | 0,17 | |
| Cultural possessions | -0,1 | 3,9 | | 0,3 | 3,8 | | 2,1 | 4,3 | | 4,2 | 3,8 | | 4,6 | 3,8 | | 3,4 | 4,2 | | |
| Speak Danish at home | 20,6 | 8,8 | 0,10 | 16,2 | 8,8 | 0,12 | 17,8 | 9,7 | 0,17 | 13,3 | 8,2 | 0,10 | 9,2 | 8,3 | 0,11 | 8,5 | 9,1 | 0,18 | |
| Mother-tongue lessons | 5,6 | 7,0 | 0,09 | 3,6 | 7,1 | 0,10 | 0,4 | 7,6 | 0,16 | 6,9 | 6,8 | 0,09 | 5,6 | 6,8 | 0,10 | 8,8 | 7,3 | 0,17 | |
| Org. leisure activities | 4,1 | 4,6 | 0,09 | 4,2 | 4,6 | 0,10 | 5,8 | 5,0 | 0,16 | 2,3 | 4,6 | 0,09 | 2,6 | 4,6 | 0,10 | 3,2 | 5,0 | 0,17 | |
| Paid job | 1,1 | 4,1 | 0,09 | 2,5 | 4,1 | 0,10 | 3,6 | 4,4 | 0,16 | -6,5 | 4,1 | 0,09 | -5,3 | 4,1 | 0,10 | -6,7 | 4,3 | 0,17 | |
| Help schoolwork | -6,5 | 2,6 | 0,10 | -5,8 | 2,6 | 0,12 | -4,0 | 2,9 | 0,16 | -5,1 | 2,5 | 0,10 | -4,9 | 2,5 | 0,11 | -4,6 | 2,7 | 0,18 | |
| Miss school | -24,6 | 5,0 | 0,11 | -23,9 | 5,0 | 0,13 | -25,7 | 5,6 | 0,18 | -22,3 | 4,8 | 0,11 | -20,7 | 4,8 | 0,12 | -22,7 | 5,4 | 0,18 | |
| <i>Percentage immigrants in school*:</i> | | | | | | | | | | | | | | | | | | | |
| 10-25% | -23,8 | 14,9 | | -25,7 | 14,9 | | - | - | | -25,6 | 15,2 | | -27,3 | 15,1 | | - | - | - | |
| 25-50% | -33,0 | 14,6 | 0,10 | -37,6 | 14,6 | | - | - | | -35,0 | 15,0 | 0,11 | -40,4 | 15,0 | 0,12 | - | - | | |
| 50-100% | -44,0 | 14,0 | | -47,7 | 14,0 | 0,12 | - | - | | -54,2 | 14,6 | | -57,0 | 15,1 | | - | - | | |



Using data from three Danish PISA-studies, I conduct an exploratory investigation of the relation between home culture and parental involvement and attitudes towards integration and school on immigrants' test scores. The result indicates that only a few of the indicators investigated in this study can be shown to influence students' test scores. Cultural communication is shown to be the factor of home culture that is most closely related to higher test scores.

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