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Dronkers, Jaap

Maastricht University - Research Center for Education and Labour Market, Maastricht Research School of Economics of Technology and Organization (METEOR)

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Positive but also negative effects of ethnic diversity in schools on educational performance? An empirical test using cross-national PISA data.

Jaap Dronkers

Positive but also negative effects of ethnic diversity in schools on educational performance? An empirical test using cross-national PISA data.¹

Jaap Dronkers²

Abstract

In this inaugural lecture, I will estimate the effects on language skills of two characteristics of school populations: average/share and diversity, both on the ethnic and the sociocultural dimension. I will use the cross-national PISA 2006 data, for both 15-year-old native pupils and pupils with an immigrant background. A larger ethnic diversity of schools in secondary education hampers the educational performance of both pupils with an immigrant background and native pupils, but the negative effects are smaller in education systems with little stratification and strongest in highly stratified education systems. The sociocultural diversity of schools does not have an effect on educational performance, but these effects are positive in highly stratified educational systems and negative in hardly stratified systems. However, the average parental educational level of schools is very important for the educational performance of children, and this hardly differs between education systems. A higher share of pupils with an immigrant background in a school hampers educational performance, but if these pupils have the same regional origin (Islamic countries; non-Islamic Asian countries), a higher share of pupils with an immigrant background at that school promotes educational performance. Pupils originating from Islamic countries have substantially lower language scores than equivalent pupils with an immigrant background from other regions. This cannot be explained by the individual socioeconomic backgrounds, school characteristics, or education systems.

Average/share and diversity of school populations

This inaugural lecture focuses on two characteristics of school populations: average/share and diversity.

The sociocultural *average/share of a school* is the single most influential school characteristic in all OECD countries, more important than a shortage of qualified teachers or the size of classes (Scheerens & Bosker, 1997). In the context of this lecture, "sociocultural average of a school population" is defined as the average educational level of the pupils' parents. The higher the average educational level of these parents, the better the pupils perform compared to similar pupils in schools with lower average educational levels of the parents. Since the Coleman report (1966), this has been one of the controversial insights in education science. It must be added, however, that the effects of the sociocultural average of a school are smaller than the effects of a parent's educational level on the performance of the individual pupil concerned. In other words: for individual pupils, it is more important that their own parents are highly educated than that this is the case for the parents of fellow pupils.

The *diversity of a school* concerns the variety of pupils in that school. The sociocultural diversity of a school is large if the parents of its pupils include many highly educated as well as low educated parents. A school with only highly or only low educated parents, is classified as a school with a very small diversity.

Diversity and average/share may be related concepts, but they differ in essence. Schools may be hardly diverse (only highly or low educated parents), but their averages may differ greatly (the former has a high average educational level, the latter a low average educational level). The opposite is also possible: schools with the same average educational level of their pupils' parents, may differ considerably as to diversity: the one school only has parents with the same educational level, while the other school has parents with a variety of educational levels, but the average of those levels corresponds to that of the first school.

The concepts of diversity and average/share of schools are often confused, not only in everyday conversation, but also in policy documents and newspapers (Kossen & de Vries, 2010). In addition, almost all studies on the effects of school populations (Driessen, 2007; Ewijk & Slegers, 2010) restrict themselves to measuring the average/share, while the diversity of the school populations is not dealt with separately.³ However, it is necessary to make a clear distinction between average/share and diversity,

because they are intrinsically different concepts, even if they are strongly related in real situations. In this lecture, I will measure the average/share and diversity separately and determine their individual effects on educational performance.

Ethnic and sociocultural dimensions of average/share and diversity

I have already used the example of sociocultural average and diversity, in which the parents' educational level of a school's pupils is used to measure both.⁴ Another dimension where school populations in OECD countries differ, is the country of origin of the pupils' parents, which - for the sake of brevity - I will here refer to as ethnic share and diversity.⁵ These two dimensions are also confused often, both in everyday conversation and in policy documents and newspapers (Kossen & de Vries, 2010). In this lecture, however, I will measure the sociocultural and ethnic dimensions separately and determine their individual effects. I first distinguish pupils on the basis of the highest educational level attained by their parents. Secondly, I split up the pupils with an immigrant background on the basis of their country of origin. A series of cross-national studies, which started with Tubergen's (2005), has shown that it is necessary to simultaneously look at both the country of origin and the destination country of immigrants and their children.⁶ Failing to do so leads to distorted results, also with regard to the interpretation of school characteristic (such as average/share and diversity) and education systems, because by the nature of the immigration process, immigrants are unevenly divided across schools and education systems.

The questions underlying this lecture

In this lecture, I will try to answer two questions:

1. Does greater ethnic and sociocultural diversity of schools promote the educational performance of pupils with an immigrant background, while hampering the performance of native pupils, also if we take into account the ethnic and sociocultural average/share of the school population?

2. To what extent does the degree of differentiation in secondary education influence the effects of ethnic and sociocultural diversity and the average/share of school populations?

I will try to test these two questions empirically, using the PISA data (cross-national data that allow us to compare the language skills of 15-year-old pupils in OECD countries). The advantage of the use of these international PISA data for this analysis, is that the variance of independent variables is greater, because it was not necessary to restrict oneself to an historically developed combination of certain groups of immigrants in a particular destination country. As a result, the actual relation between degrees of average/share and diversity will be smaller than within a single country.⁷

This also means that the content of this lecture faithfully reflects the nature of this chair.

Mechanisms that may create a positive effect of diversity

Greater diversity of school populations means that diverse schools have more pupils whose capabilities and potential differ more from each other. The following mechanisms could therefore create a positive effect of diversity on the individual educational performances: 1. In more diverse schools, there are also good pupils who may help weaker fellow-pupils, either by giving actual help, or by setting an example; 2. In more diverse schools, weaker pupils have a greater chance of a challenging curriculum, because the teachers teach that subject matter to the better pupils; 3. More capable pupils in more diverse schools also learn better themselves because they explain the subject matter to weaker pupils. 4. The greater diversity of pupils makes teaching in more diverse schools more attractive, so it is easier to recruit and keep good teachers (see Westerbeek (1999), Driessen (2007)).

If these mechanisms are powerful enough, promoting ethnic and sociocultural diversity is a policy instrument for increasing the quality of schools (Kossen & De Vries, 2010).

Mechanisms that may cause a negative diversity effect

The mechanisms that are supposed to cause a negative diversity effect include: 1. A more homogeneous pupil population increases the possibility that teachers specialise in teaching their specific pupils, thus increasing school effectiveness; 2. In a more homogeneous population, less time needs to be spent on

bridging ethnic and sociocultural differences between pupils, leaving more time for teaching and learning and hence school effectiveness is higher; 3. In more homogeneous schools, the mutual trust among pupils, parents and teachers is assumed to be higher, resulting in greater involvement of pupils, parents and teachers and hence greater effectiveness of such schools;⁸ 4. In more homogeneous schools, the level of discrimination of minorities could be lower, as a result of which fewer pupils feel restricted in their development.⁹

The limitations of the PISA data do not allow me to measure all these mechanisms separately, so for the purpose of this lecture, I was only able to measure the sum total of positive and negative mechanisms.

Mechanisms that may cause the average effect of school populations

The sociocultural average of pupil populations affects educational performance through five mechanisms: 1. The level of the curriculum at which teachers in a school with a particular pupil population are able to teach; 2. The level with which pupils assess their own performance, given the level of their fellow pupils; 3. The amount or real teaching time for teachers and real learning time for pupils, which decreases by the loss of time that needs to be spent on other things than teaching or repetition of insufficiently understood subject matter because of the average of the pupil population; 4. The total volume of financial, cultural and social resources that the parents of the pupils from the specific populations may provide in order to allow the learning process to run as well as possible; 5. The varying average quality of teachers at school (for a detailed discussion of these mechanisms, see Dronkers, 2010).

Partly because of the limitations of the PISA data, I cannot measure all these mechanisms separately for this lecture, but the total outcome of these mechanisms can be measured. Only the last two mechanisms (resources and teacher quality) can be included in the analysis to some extent.

Education systems and diversity of school populations

The degree of differentiation in secondary education may have an influence on the effects of diversity and average/share of school populations, because the more differentiated an education system is, the greater the chance that the differences between schools, and hence school populations, will be larger. Not taking into account the education system within which schools operate, therefore leads to misspecification of the effects of school populations (Dunne, 2010). In addition, both Heus & Dronkers (2010) and Fossati (2010) suggest that differentiation of education systems among pupils with an immigrant background has a different effect than among native pupils. Immigrants from different countries of origin are also unequally distributed across destination countries and hence across education systems.

Prior research

Strangely enough, no empirical studies have been done that simultaneously measure the effects of average/share and diversity of school populations on educational performance. Most studies restrict themselves to measuring the effects of the average/share of school populations (see Driessen, 2007) and, depending on the quality of the measurement of ethnic and sociocultural average/shares (Ewijk & Slegers, 2010), find significant effects, even though - as usual - these are small compared to the effects of individual effects (Scheerens & Bosker, 1997). Westerbeek's dissertation (1999) comes closest to the approach used here, but her data for the Netherlands were too restricted to be able to analyse average/share and diversity simultaneously.

Data

For this lecture, I have used the 2006 version of the *Program for International Student Assessment* [PISA]. Since 2000, this test is being taken every three years by 15-year-old pupils living in a large number of OECD member states. The purpose of this test is to map the competences in the fields of mathematics, physics and reading at the end of the period of compulsory education (at the age of 15 or 16 in most Western countries). Although the focus of PISA 2006 is on physics, the test also measured the pupils' reading skills (OECD, 2007), and it is these reading skills that have been used for this lecture.¹⁰ The PISA

data for each participating country constitute a representative sample of the schools that teach 15-year-old pupils. Each school that has been selected tests a sample of all 15-year-olds, irrespective of their level or class. In addition to educational performance, PISA also supplies information on a large number of individual background characteristics and school characteristics. The school principals provide details on a variety of school characteristics, such as student-teacher ratio, teacher shortages and the location of the school. In the student questionnaires, pupils are asked for information on such things as the educational level of their parents, the availability of resources at home, the language spoken at home and the country in which their parents were born. Considering the fact that the information on the country of origin of both parents is crucial for my two research questions, we can only include countries that provide sufficient specific information on these countries of origin. Although no fewer than 57 countries took part in PISA 2006, only the following 15 Western countries were suitable to test the hypotheses: Australia, Austria, Belgium, Denmark, Finland, Germany, Greece, Latvia, Liechtenstein, Luxembourg, New Zealand, Norway, Portugal, Scotland and Switzerland. However, the relevant question was not asked in a similar way in all countries. This was done by asking the country of origin for the main immigrant groups in the country concerned. In the German questionnaires, possible countries of origin were therefore: Russia, Former Yugoslavia, Greece, Italy, Poland and Turkey, while the Scottish questionnaire listed the options China, India, the Middle East, Africa, the Caribbean, and Europe.¹¹ The Dutch PISA data only distinguished between inside and outside Europe, and had therefore become unusable (see Dronkers, 2005). This makes little difference for this Dutch lecture, because Dutch education is not as exceptional or special as some may think. The analysis was based on 8,281 immigrant pupils from 35 different countries of origin, living in 15 Western destination countries¹² and all 60,502 native pupils in these 15 Western countries. These respondents were subsequently reweighed in such a way that each destination country represented a total of 5,000 native and immigrant pupils. For a detailed description of the data and performance scores of the pupils from the different countries of origin, I refer to previous publications (Heus & Dronkers, 2010)

The PISA data only allow us to determine the school average/share, because only 15-year-olds were tested, not all pupils of the classes containing most 15-year-old pupils. As the processes causing the positive or negative effects of school populations operate more at class level than at school level, the measurement used here will lead to underestimation of the effects. Both ethnic and sociocultural diversity and average/share were measured at school level, and hence the effects will be underestimated to a similar degree.

Variables

The variables used are shown in Table 1, separately for native pupils and pupils with an immigrant background. The variables were coded similarly for both categories of pupils, but of course the immigrant characteristics (such as the country of origin) are irrelevant for native pupils.

Dependent variable: linguistic performance

The dependent variable in this study is linguistic performance. To measure linguistic skills accurately would make the test too long to be feasible. Hence a large number of very similar, but shorter tests were created. As such different tests can never have exactly the same degree of difficulty, *Item Response Modelling* (IRM) was used to achieve comparable results between pupils who made different tests. In this analysis, we averaged the five plausible values that were obtained from the IRM. The linguistic skills scores were standardised for the OECD countries using an average of 500 and a standard deviation of 100.

Ethnic and sociocultural diversity of schools

Using the numbers of pupils from all countries of origin in the school involved, I calculated the Herfindahl index of ethnic diversity (varying between 0 and 1).¹³ Every country of origin here represented a separate ethnic group, including the native pupils. The index should be interpreted as follows: the value 0 means that there was no ethnic diversity at all in the school, because all pupils came from the same country of origin. Values that approach 1 represent a very high degree of diversity: all pupils at that

school come from different countries of origin. The Herfindahl index has been criticised for being ‘colour-blind’ (Stolle, Soraka, & Johnston, 2008; Voas, Crockett, & Olson, 2002), which means that a school with 20% Turkish pupils and 80% native pupils, obtains the same diversity score as a school with 20% native pupils and 80% Turkish pupils. The specific ethnic share of the school is therefore also important, and hence I used appropriate indicators.

In a similar way, I calculated the sociocultural diversity of schools. Using the highest educational level of the parents, measured according to the ISCED classification (UNESCO, 2006), all pupils could be classified into different groups based on their parents' education categories. On the basis of these numbers of pupils in all those parental education groups of the school concerned, I calculated the Herfindahl index of sociocultural diversity (varying between 0 and 1).¹⁴ The index should be interpreted as follows: a value 0 means that there is no diversity, because all parents of all pupils at that particular school have exactly the same educational level. A value approaching 1 indicates a very high level of diversity: the educational levels of the pupils' parents at that school all vary greatly. As this Herfindahl index of sociocultural diversity is “level-blind” and therefore insensitive to the average parental educational level, I have also added the average highest parental educational level of a school to the analysis.

Ethnic and sociocultural average/share of schools

The *countries of origin of the pupils with an immigration background* were combined into four categories. Combining countries is not ideal, because the social average/share should have been calculated for each country of origin individually. However, this would have led to a large number of average/share indexes, which would not have increased the clarity of the results. On the other hand, having one or two indexes (for example the percentages of Western and non-Western immigrants per school) would have obscured the previously observed differences in educational performance of immigrant pupils from different regions of origin (Levels & Dronkers, 2008; Levels, Dronkers & Kraaykamp, 2008). On the basis of these earlier analyses of PISA 2003 data, I calculated four indexes: percentage of pupils from Eastern Europe per school; percentage of pupils from non-Islamic Asia per school; percentage of pupils from Islamic countries per school; percentage of pupils from Western OECD countries per school. These indexes are the necessary counterparts of the Herfindahl index of ethnic diversity, which after all is “colour-blind”. Together, these indexes measure the combined effect of ethnic diversity and ethnic shares.

Using the highest educational level attained by the parents, measured according to the ISCED classification (UNESCO, 2006), I also calculated the average parental educational level per school. This index is the necessary counterpart of the Herfindahl index of sociocultural diversity, which after all is “level-blind”. Together, these indexes measure the combined effect of sociocultural diversity and sociocultural average. The average parental educational level per school was then set to zero for all destination countries and all pupils, so that the comparisons for this item show the results for the average pupil.

Characteristics of individuals

In line with Rumbaut (2004), we have distinguished generations based on the countries of origin of both parents and child, and the age at which the child emigrated. *Second-generation immigrant pupils* are pupils with at least one parent who was born abroad, while the pupil was born in the destination country. Pupils who belong to the first generation, were themselves born abroad.

Having *one native parent* is a dummy variable indicating whether pupils had one native and one immigrant parent (1) or two immigrant parents (0; reference category).

Home language is a dummy variable indicating whether the child speaks the country's official language at home (yes 1; no 0).

Regional origin of pupils with an immigrant background: pupil originating from Eastern Europe (Albania, Belarus, Bosnia, Croatia, Czech Republic, Estonia, Hungary, Macedonia, Poland, Rumania, Russia, Serbia & Montenegro, Slovakia, Slovenia, Ukraine); pupil originating from non-Islamic Asia (China, India, Korea, Philippines, Vietnam); pupil originating from Islamic country (Albania, Bangladesh,

Bosnia, Morocco, Pakistan, Turkey); pupil originating from non-Western OECD country (Australia, Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States).

The *Index of economic, social and cultural status of the parents* is a combination created by PISA of the occupational status of the parents measured in accordance with the ISEI scale (Ganzeboom, De Graaf, Treiman & De Leeuw, 1992), the educational level of the parents measured in accordance with the ISCED classification (UNESCO, 2006), and the presence of any material or cultural resources at the pupils' homes.¹⁵ This combination of the parents' occupational status and educational level, together with the resources at home, produces the strongest indicator of the parental environment. I set the average of this index of economic, social and cultural status of the parents for all destination countries and all pupils to zero, to ensure that the comparisons for this item show the result for the average pupil.

Grade. Considering the fact that not all pupils were at the same level or in the same class at the time of the PISA survey, I have used the 'grade' variable in order to take this into account. The average of this grade variable was set to zero for all destination countries and all pupils, to ensure that the comparisons for this item show the result for the pupil at the average level of 15-year-olds.

Girl.

Characteristics of schools

The degree in which schools suffer a *shortage of teachers* is an index compiled by PISA which indicates to what extent education is hampered by the following factors: a lack of qualified physics teachers, a lack of qualified mathematics teachers, a lack of qualified language teachers and a lack of qualified teachers for the other subjects. This index is based on the answers given by the school principals. The average of this index for teacher shortage was set to zero for all destination countries and all pupils, to ensure that the comparisons for this item show the result for the pupil in schools with an average shortage of teachers.

Student-staff ratio: the number of students per member of staff per school. This index is based on the answers given by the school principals. The average for this ratio was set to zero for all destination countries and all pupils, to ensure that the comparisons for this item show the result for the pupils in schools with an average student-staff ratio.

School located in (large) *city*.

Characteristics of education systems

The *degree of stratification of an education system* is indicated by 'highly stratified', 'moderately stratified' and 'hardly stratified'. We define Austria, Germany, Liechtenstein and Switzerland as countries with highly stratified systems; Belgium, Greece, Luxembourg and Portugal are regarded as countries with moderately stratified systems; and Australia, Latvia, New Zealand and Scotland are countries with hardly stratified systems. This classification is based on the age when pupils first need to make a choice between different types of education, the number of types of education pupils can choose from, and the presence of a more hidden clustering of pupils on the basis of performance (internal stratification). Although PISA provides this information for all destination countries, we have also used information provided by country experts (Schneider, 2008; Shavit and Müller, 1998; UNESCO, 2007). In general, these different sources show a similar pattern. In the highly stratified education systems, pupils can choose from at least 3 types of education at the age of 10 (Austria and Germany), at the age of 11 (Liechtenstein), or at the age of 12 (Switzerland). The Netherlands also has a highly stratified education system. In the moderately or hardly stratified systems, pupils cannot choose between different types of education until the age of 15. I have used two dummy variables to show the degree of stratification. Hardly stratified systems (Australia, Latvia, New Zealand and Scotland) constitute the reference category.

Analysis

Native pupils and pupils with an immigrant background have been analysed separately, using a multilevel analysis with three levels: pupils, schools and countries. In pupils with an immigrant background, the country level is also split into country of origin and country of destination. As origin and destination are

not hierarchically classified, a so-called double multilevel regression analysis is required (Snijders and Bosker, 1999; Hox, 2002). This is because the individual immigrants are both 'nested' within the countries of origin and within the destination countries, while the levels of countries of origin and destination cross one another, instead of being hierarchically classified.

Tables 2 and 3 show the results for pupils with an immigrant background and native pupils, respectively. The structure of the analysis is identical in both cases. The first model shows the effect of both ethnic and sociocultural diversity and average/share on the pupils' language skills. In the second model, the individual characteristics of pupils (including their immigration characteristic) are added, so that the effects of ethnic and sociocultural diversity and average/share can no longer be distorted by the unequal distribution of pupils across schools with different populations. The third model (which is only relevant for pupils with an immigration background) determines whether a particular ethnic share of schools affects the language skills of pupils with the same ethnic backgrounds. In the fourth model, I have added other school characteristics, in order to find out whether or not the effects of ethnic and sociocultural diversity and average/share have been caused by the schools' resources. The last two models include into the analyses the level of stratification of education systems in relation to both ethnic and sociocultural diversity and average/share of schools.

Research results

The main results, based on Tables 2 and 3, and in particular Models 4 and 6, are:

1. A greater ethnic diversity of schools has a *considerable negative effect* on the learning performance of both pupils with an immigrant background and of native pupils. The negative effect is equally large for both groups, but on average, pupils with an immigrant background attend schools with a four times larger ethnic diversity than native pupils (Table 1). This negative effect of ethnic diversity cannot be explained by the share of pupils with an immigrant background in more ethnically diverse schools, by the social environment of the schools, by the individual characteristics of the pupils, by the schools' resources, nor by education system. Figure 1 shows these results in a diagram. The effects of ethnic diversity are negative in all education systems, but the negative effect is smaller in education systems with little stratification, while the effect is greatest in education systems with a high level of stratification. Figure 2 shows these different effects from Tables 2 and 3 again, in a diagram.
2. Greater diversity in the parental educational level of schools has *no significant positive or negative effect* on the learning performance of either pupils with an immigrant background or native pupils. This non-significant effect cannot be explained by the share of pupils with an immigrant background in more diverse schools, nor by the social environment of those schools, the individual characteristics of the pupils, the schools' resources, or the education system. Figure 3 shows these results in a diagram. This effect of diversity in the parental educational level of schools does differ between education systems. Diversity of the parental educational level does have a positive effect in highly stratified education systems, whereas such diversity has a negative effect in education systems that are hardly stratified. This negative effect of the parental educational level of schools also occurs in education systems with a moderate degree of stratification, but only among native pupils. Figure 4 shows the differences between effects from Tables 2 and 3 again, in a diagram.
3. A higher percentage of *pupils from Islamic countries* in a school decreases the learning performance of all other pupils with an immigrant background (-0.6 points in the language skills test per 1.0% more pupils from Islamic countries), but not the performance of native pupils. This negative effect of a higher percentage of pupils from Islamic countries in a school does not apply to pupils from Islamic countries, who have neither any advantage nor disadvantage ($= -0.6 + 0.6$) for their language skills from the fact that there are more pupils from Islamic countries. This effect of the percentage of pupils from Islamic countries cannot be explained by the ethnic diversity of schools, by the social environment of those schools, by the individual characteristics

of the pupils, by the schools' resources, nor by the education system. Figure 5 shows these results in a diagram.

4. A higher percentage of *pupils originating from non-Islamic Asian countries* in a school increases the learning performance of native pupils (1.2 points in the language skills test per 1.0% more pupils from non-Islamic Asian countries). The positive effect of a higher percentage of pupils from non-Islamic Asian countries also applies to pupils from non-Islamic Asian countries: they score 1.2 points (= 0.3 + 0.9) higher in the language skills test for 1% more pupils from non-Islamic Asian countries. This means that pupils from non-Islamic Asian countries can quickly convert their non-significant advantage in the language skills test (1.6)¹⁶ in schools with many pupils from non-Islamic Asian countries into a significant advantage in educational performance, in particular compared to other pupils with an immigrant background. This positive effect of a higher percentage of pupils from non-Islamic Asian countries does not apply to pupils with a different migrant background. This effect of the percentage of pupils from non-Islamic Asian countries cannot be explained by the ethnic diversity of the schools, by the social environment of those schools, by the individual characteristics of the pupils, by the schools' resources, nor by the education system. Figure 6 shows these results in a diagram.
5. The language skills score of *native pupils* is negatively affected by the percentage of *pupils from Western OECD countries* (-0.5 points for 1% more pupils from Western OECD countries), but not significantly by the percentages of pupils from Eastern Europe or from Islamic countries. The language skills score of native pupils is influenced positively by the percentage of pupils from non-Islamic Asian countries (1.2 points for 1% more pupils from non-Islamic Asian countries). This effect of the percentage of pupils from non-Islamic Asian countries cannot be explained by the ethnic diversity of the schools, by the social environment of those schools, by the individual characteristics of the pupils, by the schools' resources, nor by the education system. Figure 7 shows the results in a diagram.
6. The *average educational level of the parents of pupils in a school* has a great effect on language skills, both for pupils with an immigrant background (41.0) and for native pupils (37.4). The effect was equally great for both groups, but pupils with an immigrant background are in schools in which the parental educational level is 1/3 of the standard deviation lower than for native pupils (Table 1). Figure 8 shows these results in a diagram. The effects of the average parental educational level of pupils in a school differ little for native pupils in different education systems, but there are differences between education systems for pupils with an immigrant background. In hardly stratified education systems, the effect is slightly less strong than for native pupils, whereas in moderately stratified systems, it is stronger than for native pupils. Figure 9 shows these differences in effects, based on Tables 2 and 3, again in a diagram.
7. What remains in Model 6 of Table 2, are substantially lower language scores (34 points = 1/3 of the standard deviation) among pupils from Islamic countries, which cannot be explained on the basis of the standard socioeconomic individual backgrounds, or the characteristics of the school or education system. None of the other comparable pupils with an immigrant background originating from non-Islamic countries have a substantially lower score than the reference group of "pupils from Western OECD countries". What the latter group does have, is a slight disadvantage compared to native pupils. Figure 10 shows these differences in effects from Models 2, 4 and 6 from Table 2 again, in a diagram.

Conclusions

Diversity in education is a much too wide catch-all term to be applied usefully. We need a clear conceptual and policy-oriented distinction between diversity and average/share of schools. Ethnic and sociocultural diversity and average/share should also be conceptually regarded as two different dimensions. The current research and policies on diversity and average/share of schools fails to provide this conceptual and policy-oriented clarity.

Greater ethnic diversity of schools hampers to a similar degree the educational performance of both pupils with an immigrant background and native pupils, but the negative effect is smaller in education systems with little stratification in secondary education, while the effect is greatest in education systems with a high degree of stratification. A possible explanation for this difference in the size of this negative effect of ethnic diversity may be that the ethnic diversity of schools in highly stratified education systems refers to curriculum differences between the types of education, whereas such curriculum differences in hardly stratified education systems do not yet exist for 15-year-old pupils.

Greater or smaller sociocultural diversity of school neither hampers nor promotes the educational performance of pupils with an immigrant background or the performance of native pupils. What does differ is the effect between education systems. A possible explanation for this difference in the effect may be that the sociocultural diversity of schools in hardly stratified education systems refers to the sociocultural diversity of the recruitment area of the schools and to the lower social quality of that recruitment area. In highly stratified education systems, the focus is on the type of education that is chosen and the subsequent selection for this type of education. Socioculturally diverse schools within the different types of education of the stratified systems apparently do provide an attractive learning environment, perhaps because the selection makes the schools homogeneous in terms of the pupils' learning capacities and in these circumstances sociocultural diversity may be an incentive.

The average parental educational level of the pupils in a school, on the other hand, is of great importance for the pupils' language skills. The main characteristic of school populations is therefore not sociocultural diversity, but sociocultural average. There are relatively few differences in the effect of the average parental educational level of pupils at school in the different education systems.

Ethnic diversity of schools has a negative effect on educational performance, but this does not apply to sociocultural diversity at schools. Why not? Is ethnic diversity more difficult to bridge than sociocultural diversity? Does ethnic diversity require more and “more costly” social capital (more bridging than bonding) than sociocultural diversity (less bridging than bonding)? Does greater ethnic diversity in schools therefore demand more time to bridge the differences, as a result of which the amount of teaching and learning time is less in ethnically diverse schools? Is, for this reason, less time required to bridge the differences in socioculturally diverse schools, so that the amount of teaching and learning time is not less in socioculturally diverse schools?

This analysis shows again that making a distinction between the countries of origin is necessary in order to understand better the effects of immigration in education. The statement made by Dutch Labour MP Karin Adelmund in September 2005 (‘This is a Turkish or Moroccan child, so he/she will probably not do well in school, whereas the Chinese refugee child does great. This is just not true, the reverse could also be the case’¹⁷) is superseded. Our results also show that it is very important to include all countries in our research, not only the usual ones: Dutch Antilles, Surinam, Turkey, and Morocco. Singling out only these four groups, means to close one's eyes for successful immigrants from other regions (non-Islamic Asia), to underestimate the positive effect of certain types of immigration, and to have less understanding of the causes of integration and assimilation of immigrants in the destination countries. Our results also show that the usual distinction made by EUROSTAT and Statistics Netherlands between Western and non-Western immigrants does insufficient justice to the differences within these broad categories.

Pupils from *non-Islamic Asia* have an advantage when it comes to educational performance, also compared to native pupils. This advantage only shows after taking into account the education systems, because immigrants from different regions of origin are unequally distributed across destination countries. The advantage renders a greater presence of this group of immigrant pupils in schools a benefit for educational performance of immigrant pupils with a different origin and of native pupils. The standard explanations for this advantage (working harder for education; authoritarian education system; the “ideal immigrant”) do not stand up empirically (see Dronkers & Heus, 2010b). Asia is therefore a much greater challenge for Europe in the field of education than the US (see also Dronkers, 2010).

Pupils from Islamic countries have a substantial disadvantage in language scores compared to other immigrant pupils from other countries of origin, which cannot be explained on the basis of

individual socioeconomic backgrounds, school characteristics or the education system's characteristics. Multiple explanations may be proposed: a discriminating attitude towards immigrant children from Islamic countries; negative selectiveness of guest worker programmes, where most guest workers in Europe came from Islamic countries; values and standards of the current Islam which are less suitable for success in modern societies (honour, unequal gender roles). André, Dronkers and Fleischmann (2009) have used data from the *European Social Survey* to show that the degree of subjective feelings of discrimination in immigrants in the EU is not greater than in Greek Orthodox or Jewish believers. Dronkers and Heus (2010a) have shown that the negative selectiveness of immigrants from Turkey is not greater than that from non-Islamic guest worker countries (Yugoslavia, Italy, Portugal). Dronkers and Fleischmann (2010) have shown on the basis of the same ESS data that second-generation male Muslims in Europe obtain a lower educational level than comparable immigrants with different religions. We have also shown that the Islamic faith of individual immigrants leads to a lower educational level, not the fact of originating from a country with an Islamic majority.

Compensation of the negative educational performance of pupils from Islamic countries in schools that have more pupils from Islamic countries, may explain the attractiveness of Islamic schools. But this compensation is much too small to eliminate the negative effect of the Islamic country of origin.

In analyses of the effects of school populations, such as ethnic diversity on pupils with an immigrant background and on native pupils, we need to take into account the education systems that affect their school characteristics (and hence also the average/share and diversity) (cf. Dunne, 2010).

Education systems do not always have the same positive or negative effects on the learning performance of native pupils and pupils with an immigrant background. A possible explanation of these different effects is the different meaning of the parental social environment and the different degrees of hidden talent.

Policy implications

There is insufficient empirical support for a *forced increase of diversity in schools* of secondary education: this would not increase educational performance, in particular not in highly stratified education systems. Distributing pupils from highly educated parents across all schools, is a zero-sum game at best, except in highly stratified education systems. “Bussing” ethnic minorities across schools, as applied in the USA because of the legislation, is therefore counterproductive in a hardly stratified education system like the American system. But bussing pupils from highly and low educated parents who have been admitted to the same type of education, may be effective in highly stratified education systems such as those in Germany and the Netherlands.

The *sociocultural average* and the *ethnic diversity* of school populations have significant effects on educational performance, unlike sociocultural diversity and ethnic share. This clearly shows that the concepts of average/share and diversity of a population are two conceptually distinct terms, and that it is empirically possible to measure their effects separately.¹⁸ Lumping ethnic and sociocultural average/share and diversity of schools together, as was done by *Kossen & de Vries* (2010), is therefore wrong and misleading, as is the use of the term “black school” as an excuse by principals for the poor performance of their schools.

Ethnically homogeneous schools are in a better position to decrease the educational disadvantages of immigrant pupils from certain countries or origin than ethnically diverse schools. The ethnic homogeneity of Hindu schools or Islamic schools, for example, is no valid argument for closing them with a view to the educational performance of their pupils (Driessen & Merry, 2010; Driessen, 2008).

Pupils from *Islamic countries* have substantially lower educational performances, which cannot be explained on the basis of their individual socioeconomic backgrounds, the school characteristics or the characteristics of the education system. Hammering away at the socioeconomic background or the characteristics of schools or education systems (as in *Nederland bekennt kleur* (The Netherlands shows its Colours)) as an explanation for the lower level of educational performance does not contribute to improving the situation for these pupils.

For a *correct estimation of the effect of ethnic share*, the percentage of immigrant pupils is misleading, because it does not take into account the origin of the immigrant population. As almost all analyses of the effects of school populations only use the percentage of immigrant pupils (Driessen, 2007) and fail to measure diversity, most results are distorted and therefore unreliable (a favourable exception is Westerbeek, 1999).

It is true though that differences in the diversity and average/share of schools have different effects within different *education systems*, and the results on effects of average/share and diversity can therefore not be copied from other education systems. Societies and education systems do not constitute a natural experiment.

Studies and discussions on the *advantages and disadvantages of education systems* for the level of the educational performance and for educational inequality, should always include the related school characteristics, because the effects of education systems come about largely through changes in school characteristics and school average/share (Dunne, 2010). The risk of perverse effects of well-meant changes in education systems, is therefore great. On the other hand, it is wrong to deny that education systems have no effect on the level of educational performance and educational inequality. It should be borne in mind, however, that it appears that education systems have different effects on the level of educational performance and educational inequality among native pupils and pupils with an immigrant background.

Epilogue

In spite of these research results, one may still be an advocate of increasing ethnic and sociocultural diversity in schools. However, better educational performance can no longer be used as an argument to support this view. One may feel that ethnically and socioculturally more diverse schools reduce the social distance between ethnic groups and decrease discrimination, in accordance with the Intergroup Contact Theory. The Intergroup Contact Theory was first drawn up by Allport (1954), and later extended by Pettigrew (1998) and others. The Intergroup Contact Theory states that interpersonal contact between members of the majority group and the minority group contributes to the prevention of negative views on the other group, but only if this interpersonal contact meets certain conditions. The positive result of contact between groups is greatest if five conditions have been met: equal status between groups, shared objectives, co-operation between groups, supported by legislation and customs, and the possibility of emerging friendships. Many studies support this prediction (see Pettigrew, 1998). But in many cases, not all conditions have been met. In that case, the positive effect of interpersonal contacts is less certain and forced intergroup contact may even widen the social distance between ethnic groups and increase mutual discrimination. Houtte and Stevens (2009), for example, have found in Flanders that native pupils in schools with a larger share of pupils with an immigrant background have a greater number of friends with an immigrant background. But Houtte and Stevens did not find this effect for pupils with an immigrant background: the ethnic share and diversity of school populations did not affect their number of native friends. Neither did they find a relationship between the ethnic share and diversity of Flemish schools and the pupils' sense of feeling at home in school.

But even if the policy of increasing ethnic diversity in schools were to reduce the social distance between ethnic groups, this need not automatically be a reason to continue this policy. In that case, a political choice needs to be made, which is the following: "What is more important for our society: less social distance between ethnic groups, or better educational performance of immigrant pupils?" This is a political question, which cannot be decided by scientific research, as the answer depends on the standards and values of the citizens. But before they answer this question, the citizens should know that ethnic diversity has both positive and negative effects. In their choice for better educational performance, the citizen who makes a choice should also remember that in that case the 'real and existing' discrimination of highly-educated immigrants in the European labour markets (Heath & Cheung, 2007; Fleischmann & Dronkers, 2008) should also be tackled. Because education cannot solve the problems of societies; at best, it can merely create the conditions that promote a reduction of those problems.

Notes

¹ This text was derived from my inaugural lecture as Professor of *International comparative research on educational performance and social inequality* at Maastricht University, held on 17 June 2010.

² E-mail: j.dronkers@maastrichtuniversity.nl. Homepage: <http://www.roa.unimaas.nl/cv/dronkers/dronkers.htm>

³ An exception is Van Houtte & Stevens (2009), but they used interethnic friendships and feeling at home in school as dependent variables.

⁴ The parental educational level is, at least for Europe, the best measure of socioeconomic average and diversity of schools, better than the occupations or income of the parents. The reliability of the incomes of a school's parents is often limited, for example because it is a dummy (qualifying or not qualifying for a particular subsidy, such as free lunches or books). Many mothers with schoolgoing children do not have a job or have a job that does not indicate their opportunities properly.

⁵ De Lange, Dronkers & Wolbers (2009) have shown that, in addition to socio-cultural and ethnic differences in school populations, there is a third dimension: the proportion of pupils with divorced parents. Unfortunately, PISA 2006 no longer measured the type of family; this is incomprehensible because divorced parents had a clear negative effect on 15-year-old pupils in PISA 2000 and 2003 (Garib, Martin Garcia & Dronkers, 2007).

⁶ Examples of such studies with both the country of origin and the destination country include Levels, Dronkers & Kraaykamp (2008), Dronkers & Fleischmann (2010), De Heus & Dronkers (2010).

⁷ Correlations between school average/share characteristics

Pearson correlations	2	3	4	5	6	7
1. Parental education diversity of the school	0.23	-0.53	0.04	-0.08	0.11	0.21
2. Ethnic diversity of the school	1	-0.17	0.46	0.22	0.38	0.76
3. Average parental educational level per school		1	-0.09	0.11	-0.16	-0.15
4. % pupils from Eastern Europe per school			1	-0.07	0.51	0.02
5. % pupils from non-Islamic Asia per school				1	-0.05	0.01
6. % pupils from Islamic countries per school					1	0.00
7. % pupils from Western OECD countries per school						1

⁸ Putnam (2007) has shown that greater ethnic diversity in neighbourhoods may lead to a lower general feeling of trust in neighbourhood and neighbours. Lancee and Dronkers (2008) found the same negative relationship between ethnic neighbourhood diversity and trust for the Netherlands. One could assume that the same phenomenon also occurs in schools.

⁹ A higher level of discrimination, however, does not automatically mean lower educational performance of the pupils who are subject to discrimination, but also depends on the way of assimilation of the group of immigrants concerned (Portes & Zhou, 1996).

¹⁰ The results for mathematics and physics are not essentially different, but in the case of language skills, they are more pronounced for pupils with an immigrant background (for obvious reasons).

¹¹ See also Levels, Dronkers & Kraaykamp (2008).

¹² As PISA allows participating countries to determine the country of origin categories themselves, the level of detail differs among countries. As a result, the countries of origin that we have identified, are dependent on the quality of the answer categories. To take this into consideration, we have compared the countries of origin that we defined with national statistics. In the case of Australia, Austria, Finland, Luxembourg, New Zealand and Switzerland, the three main groups of immigrants as listed by their national statistics, match countries of origin that we found. In the case of Belgium, Germany, Liechtenstein and Scotland, the two main groups as indicated by their national statistics, match the countries of origin identified by us. In Greece, the main group of foreign origin consists of Albanians (42 percent of all immigrants, Eurostat, 2008), and this also matches our data. The main group of foreign origin in Latvia concerns Russians (35 percent of all immigrants, Eurostat, 2008), and this is also reflected in our data.

¹³ The Herfindahl index of ethnic diversity was calculated as follows: $1 - ((\text{percentage of ethnic group 1})^2 + (\text{percentage of ethnic group 2})^2 + \dots + (\text{percentage of ethnic group n})^2)$.

¹⁴ The Herfindahl index of socio-cultural diversity was calculated as follows: $1 - ((\text{percentage of parents with educational level 1})^2 + (\text{percentage of parents with educational level 2})^2 + \dots + (\text{percentage of parents with educational level 6})^2)$.

¹⁵ The measure consists of the presence of a desk, a private room, a quiet place to study, a computer, educational software, Internet, literature or poetry, art, books that may be of use when doing schoolwork, a dictionary, a dishwasher, and the presence of more than 100 books in the house.

¹⁶ Compared to pupils from Western OECD countries.

¹⁷ In *de Volkskrant*, 9 September 2005, on the occasion of a study by Vluchtelingenwerk.

¹⁸ See a related discussion between Gijsberts, Van der Meer & Dagevos (2009) and Dronkers & Lancee (2009) on the effects of ethnic and economic average/shares and diversity in neighbourhoods on trust.

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Figure 1: Reading score of comparable native pupils and pupils with a migrant background and the ethnic diversity of their schools

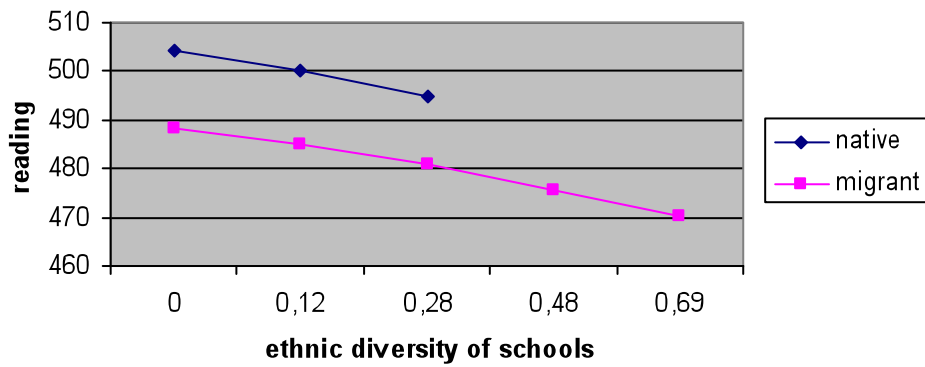


Figure 2: Effects of ethnic diversity of schools in different educational systems

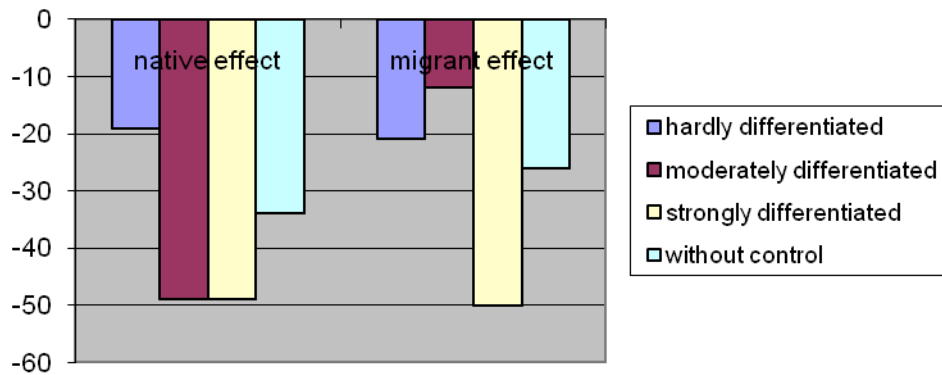


Figure 3: Reading score of comparable native pupils and pupils with a migrant background and the parental education diversity of their schools

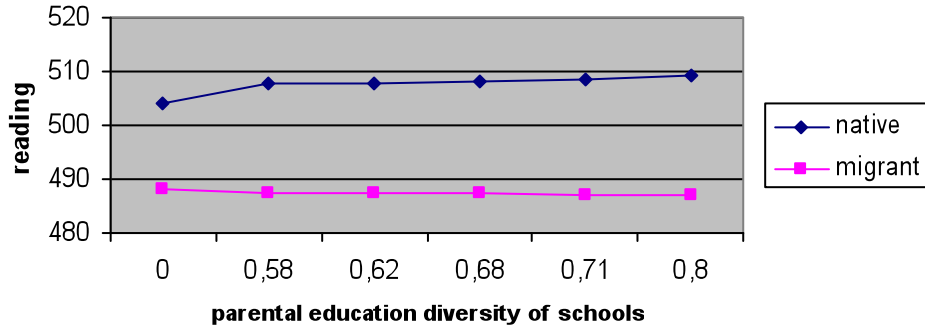


Figure 4: The effects of social-cultural diversity of schools in different educational systems

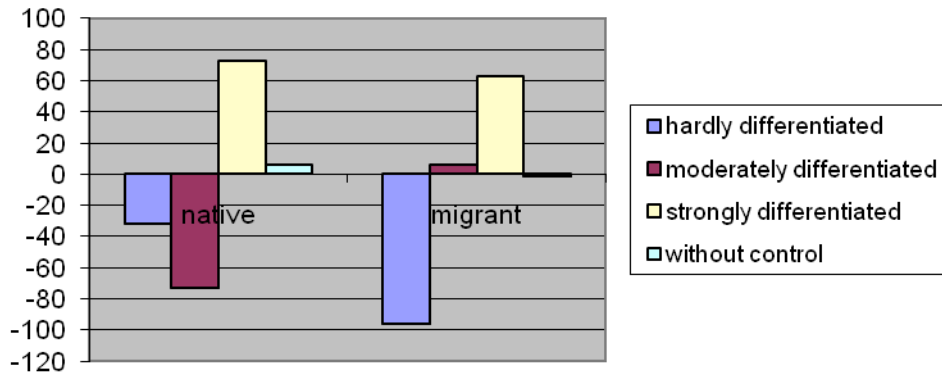


Figure 5: Reading score of comparable native pupils and pupils with a migrant background and the percentage of pupils from Islam countries in their schools

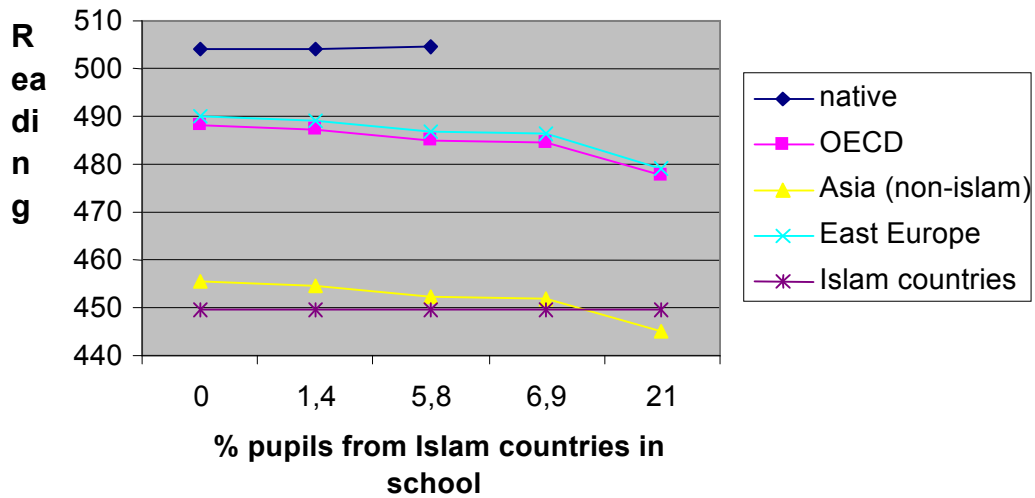


Figure 6: Reading score of comparable native pupils and pupils with a migrant background and percentage Asian (non Islam) pupils in their schools

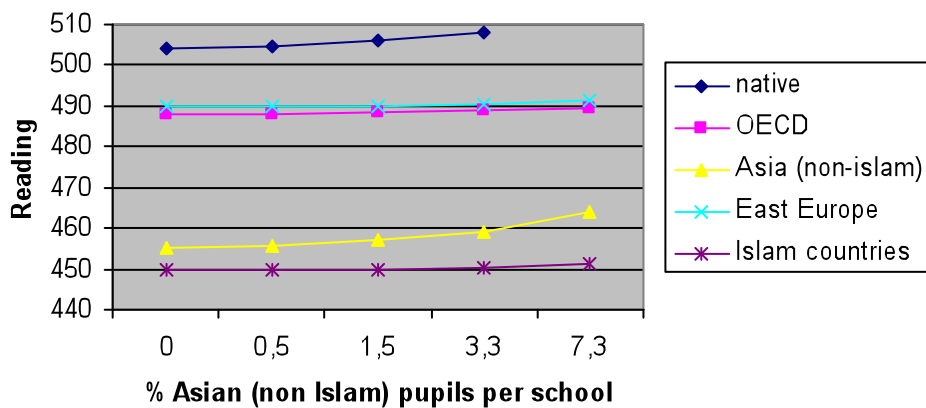


Figure 7: The percentage migrant pupils from a specific region of origin per school and the reading score of comparable native pupils

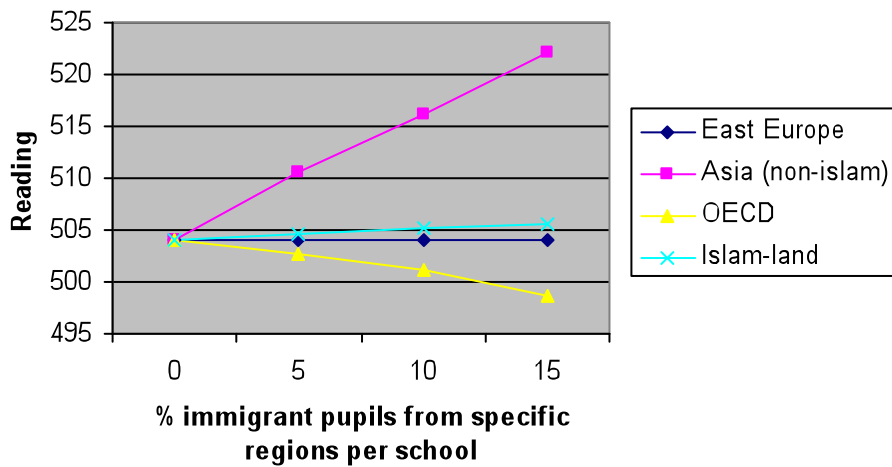


Figure 8: Reading score of comparable native pupils and pupils with a migrant background and the average parental education level of school

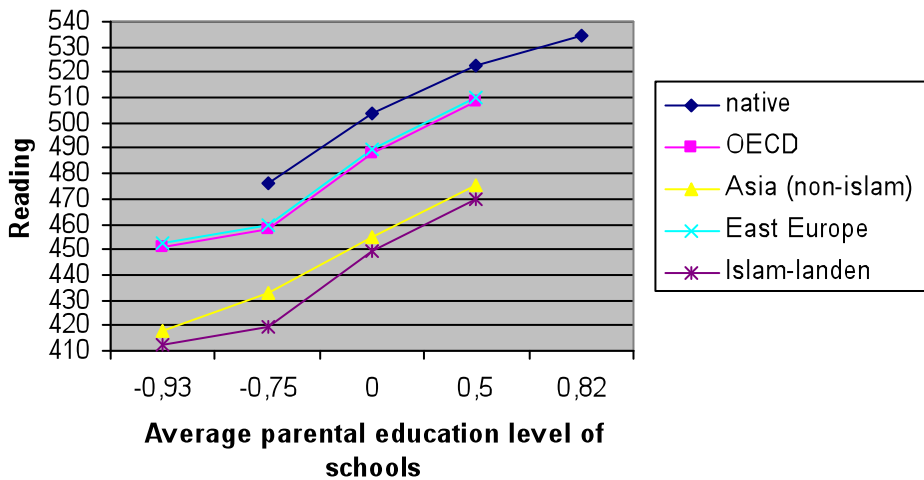


Figure 9: Effects of parental educational level per school in different educational systems

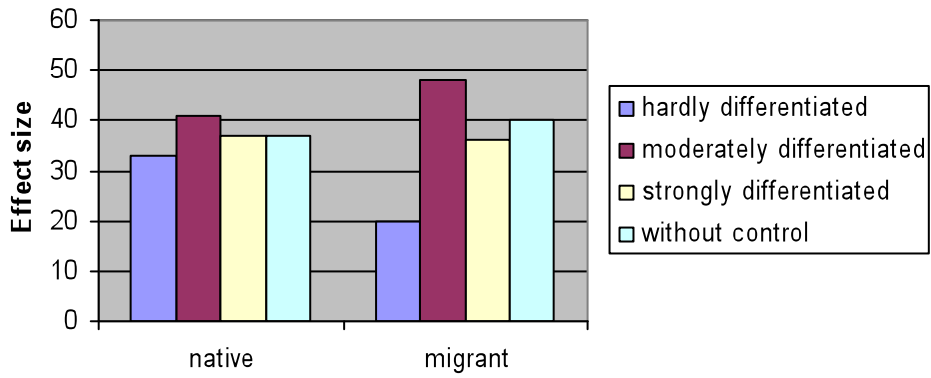


Figure 10: Reading score per region of origin in the successive models

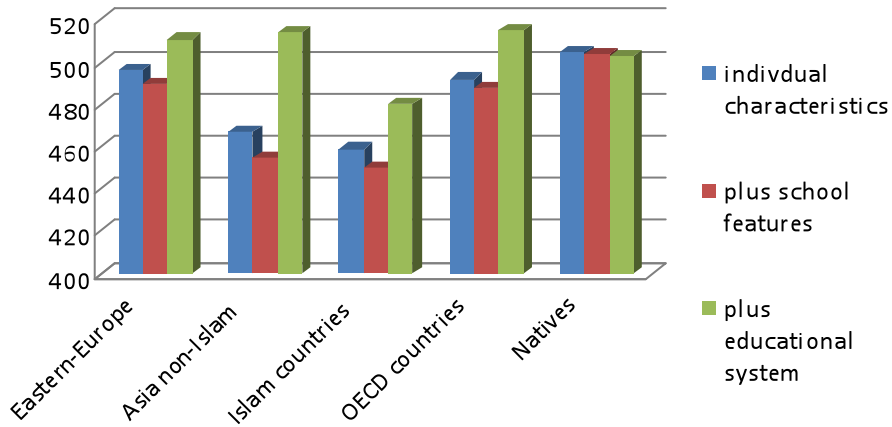


Table 1: Means and standard-deviations for pupils with a migrant background and native pupils separately.

	Pupils with migrant background		Native pupils	
	Mean	Std. Deviation	Mean	Std. Deviation
Parental education diversity of school	0.72	0.09	0.68	0.10
Ethnic diversity of school	0.48	0.21	0.12	0.16
Average parental educational level of school	-0.22	0.71	0.04	0.79
% pupils from Eastern-Europe of school	7.8	12.4	1.9	5.1
% pupils from non-Islam Asia of school	1.5	5.8	0.5	2.8
% pupils from Islamic countries of school	6.9	14.1	1.4	4.5
% pupils from western OECD-countries of school	22.2	22.0	3.4	8.3
Index economic, social & cultural status of parents	-0.32	1.05	0.04	0.91
Eastern Europe origin	0.25	0.43		
Non-Islam Asia origin	0.06	0.24		
Islamic countries origin	0.18	0.39		
Western OECD-countries origin	0.57	0.50		
Female	0.51	0.50	0.50	0.50
Grade	-0.34	0.84	0.06	0.87
Home language same as in destination country	0.52	0.50		
One parent migrant, other parent native	0.09	0.29		
Second generation migrant	0.44	0.50		
Teacher shortage	0.03	1.02	-0.00	0.94
Student/staff ratio	-0.89	4.17	0.18	3.92
School in city	0.26	0.44	0.23	0.42
Strongly differentiated educational system	0.70	0.50	0.34	0.47
Moderately differentiated educational system	0.10	0.30	0.23	0.42
Reading score	465.01	101.83	504.35	92.74
Math score	482.28	94.57	512.30	87.14
Science score	473.74	103.15	515.61	91.40
N	8281		60502	

Source: weighted PISA 2006 data for selected destination countries, own computation

Table 2: The effects of school diversity on reading score of 15-year old pupils with a migrant background.

	M1	M2	M3	M4	M5	M6
Constant	496.2	492.4	491.9	488.1	451.5	514.5
Diversity at school level						
Parental education diversity of school	-13.0	-8.1	-6.0	-1.3	-4.7	-95.9**
Ethnic diversity of school	-30.1**	-35.8**	-27.3**	-25.8*	-27.2**	-21.1
Average parental educational level of school	55.4**	40.6**	40.8**	40.1**	41.0**	20.0**
% pupils from Eastern-Europe of school	-0.2	0.1	-0.1	-0.1	-0.2	0.1
% pupils from non-Islam Asia of school	0.9**	1.0**	0.4	0.2	0.3	0.3
% pupils from Islamic countries of school	-0.2	-0.1	-0.5**	-0.5**	-0.6**	-0.5**
% pupils from western OECD-countries of school	-0.3	-0.2	-0.3*	-0.3*	-0.3*	-0.1
Individual characteristics						
Index economic, social & cultural status of parents		13.9**	13.9**	13.8**	13.6**	13.7**
Eastern Europe origin		3.9	3.5	1.7	-4.3	-3.9
Non-Islam Asia origin		-24.9	-31.6*	-32.8*	-1.6	-0.7
Islamic countries origin		-33.0**	-37.9**	-38.4**	-37.7**	-34.3**
Western OECD-countries origin		Ref.	Ref.	Ref.	Ref.	Ref.
Female		27.4**	27.5**	27.2**	27.1**	27.1**
Grade		36.1**	36.2**	35.9**	36.3**	36.4**
Home language same as in destination country		20.3**	20.2**	20.1**	21.0**	21.0**
One parent migrant, other parent native		16.8**	16.7**	16.9**	17.0**	17.3**
Second generation migrant		11.3**	11.3**	11.3**	11.2**	11.2**
Interactions between ethnic school share & analogous origin						
% pupils from Eastern-Europe of school * Eastern Europe origin			0.2	0.2	0.2	0.1
% pupils from non-Islam Asia * Non-Islam Asia origin			1.0*	1.0*	0.9*	0.4
% pupils from Islamic countries * Islamic countries origin			0.5**	0.5**	0.6**	0.9*
School features						
Teacher shortage				-4.9**	-4.6**	-5.0**
Student/staff ratio				0.6	0.5	0.5
School in city				3.0	4.2	4.8*
Educational system features						
Strongly differentiated educational system					62.3**	-43.9
Strongly differentiated educational system * Ethnic diversity of school						-29.0
Strongly differentiated educational system * Parental education diversity of school						159.2**
Strongly differentiated educational system * Average parental educational level of school						27.7**
Moderately differentiated educational system					33.6**	-44.6
Moderately differentiated educational system * Ethnic diversity of school						9.3
Moderately differentiated educational system * Parental education diversity of school						101.7**
Moderately differentiated educational system * Average parental educational level of school						16.2*
Variance						

Individual level	4729**	4014**	4017**	4019**	4019**	4013**
School level	1660**	1366**	1349**	1326**	1328**	1305**
Origin country level	700**	275	256	282	67	58
Destination country level	616**	1010**	1019**	943**	556**	546**
Log likelihood	98619	97119	97111	97094	97053	97023

Source: weighted PISA 2006 data for selected destination countries, own computation

Table 3: The effects of school diversity on reading score of 15-year old native pupils.

	M1	M2	M4	M5	M6
Constant	498.4**	504.7**	504.1**	478.0**	503.2**
Diversity at school level					
Parental education diversity of school	12.6	6.1	6.2	6.1	-32.1**
Ethnic diversity of school	-15.1	-35.2**	-33.5**	-33.7**	-19.4
Average parental educational level of school	59.6**	39.0**	37.2**	37.4**	32.8**
% pupils from Eastern-Europe of school	-0.4*	-0.0	-0.0	-0.1	-0.1
% pupils from non-Islam Asia of school	1.0**	1.3**	1.2**	1.2**	0.9**
% pupils from Islamic countries of school	-0.4**	0.1	0.1	0.1	0.4
% pupils from western OECD-countries of school	-0.7**	-0.5**	-0.5**	-0.5**	-0.4*
Individual characteristics					
Index economic, social & cultural status of parents		19.0**	19.0**	19.0**	19.0**
Female		32.7**	32.6**	32.6**	32.6**
Grade		41.6**	41.5**	41.5**	41.4**
School features					
Teacher shortage			-5.4**	-5.4**	-5.2**
Student/staff ratio			0.9**	0.9**	0.8**
School in city			1.9	1.9	1.7
Educational system features					
Strongly differentiated educational system				62.6**	-6.3
Strongly differentiated educational system * Ethnic diversity of school					-30.0**
Strongly differentiated educational system * Parental education diversity of school					101.6**
Strongly differentiated educational system * Average parental educational level of school					4.4
Moderately differentiated educational system				6.6	-14.0
Moderately differentiated educational system * Ethnic diversity of school					-30.0**
Moderately differentiated educational system * Parental education diversity of school					-40.7**
Moderately differentiated educational system * Average parental educational level of school					8.1*
Variantie					
Individual level	4820	4140	4139	4139	4139
School level	1867	1445	1420	1420	1402
Destination country level	935	1919	1845	978	934
Log likelihood	763941	752181	752131	752122	

Source: weighted PISA 2006 data for selected destination countries, own computation

