Educational Research and Evaluation: An International Journal on Theory and Practice

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/nere20

Do migrant girls perform better than migrant boys? Deviant gender differences between the reading scores of 15-year-old children of migrants compared to native pupils

Jaap Dronkers[a] & Nils Kornder[a]

[a] Research Centre for Education and the Labour Market (ROA), University of Maastricht, Maastricht, The Netherlands

Published online: 21 Jan 2014.

To cite this article: Jaap Dronkers & Nils Kornder (2014) Do migrant girls perform better than migrant boys? Deviant gender differences between the reading scores of 15-year-old children of migrants compared to native pupils, Educational Research and Evaluation: An International Journal on Theory and Practice, 20:1, 44-66, DOI: 10.1080/13803611.2013.874298

To link to this article: http://dx.doi.org/10.1080/13803611.2013.874298

Educational Research and Evaluation, 2014
Vol. 20, No. 1, 44–66, http://dx.doi.org/10.1080/13803611.2013.874298

Do migrant girls perform better than migrant boys? Deviant gender differences between the reading scores of 15-year-old children of migrants compared to native pupils

Jaap Dronkers* and Nils Kornder[1]

Research Centre for Education and the Labour Market (ROA), University of Maastricht, Maastricht, The Netherlands

(*Received 18 November 2012; final version received 2 December 2013*)

In this paper, we analyse the gender differences between the educational performance of 15-year-old children of migrants from specific regions of origin countries living in different destination countries with the Programme for International Student Assessment (PISA) 2009 wave. We study whether this gender difference of migrant pupils deviates from the gender difference between the native pupils in their destination country. We analyse the educational performance of 16,612 daughters and 16,804 sons of migrants in destination countries across Asia, Europe, Latin America, and Oceania. We distinguish 62 origin countries and 12 origin areas in 30 destination countries. Female migrant pupils have both higher reading and math scores than comparable male migrant pupils, and these gender differences among migrant pupils are larger than among comparable native pupils. Parental socioeconomic background has an equal effect on the educational performance of daughters of migrants and on that of sons of migrants. The variation in educational performance by region of origin is, however, not clearly related to the poverty or traditionalism of regions.

Keywords: PISA; educational performance; migrant; gender differences; cross-national analysis

Introduction

Today, most Western societies host a substantial and still growing immigrant population (Castles & Miller, 2003). With technological developments such as the Internet and (mobile) telephone communication, migration has increased, and less expensive ways of long-distance travel, as well as the emergence of the European Union, have helped facilitate it. Consequently, the share of foreign-born pupils in primary and secondary education in many Western countries is now larger than ever before.

Overall, the educational position of immigrant children has been well documented, but there is far less systematic documentation about the educational position of sons and daughters of migrants in relation to features of their country or region of origin. Using the 2003 data of the Programme for International Student Assessment (PISA), Levels and Dronkers (2008) found that the educational performance of immigrant pupils from certain regions was different from that of comparable pupils from other regions. Their

*Corresponding author. Email: j.dronkers@maastrichtuniversity.nl

analysis shows, for example, that second-generation migrants from Western Europe (but only those from lower-educated classes), Southern and Central America, Northern Africa, and Western Asia have substantially lower math scores than comparable natives in the destination countries. The authors conclude that both the origin and destination of migration have substantial effects on scholastic achievement, and these have an important influence on differences in scholastic knowledge between native pupils and first- and second-generation migrants. Analysing migrants' integration into host societies without properly taking into account these origin effects will lead to flawed results. Depending on the composition of the migrant population in a certain society, the results can be overly optimistic or pessimistic. Western Europe, Southern and Central America, Northern Africa, and Western Asia seem to be problematic regions of origin: Migrants from these regions perform worse in mathematics than comparable migrants from other regions, regardless of their country of destination. In addition, Levels and Dronkers also found destination effects: Some countries of destination are better equipped to deal with immigration than others. For example, their analysis shows that migrants in Denmark are doing worse than those in Germany, despite educational selection at an older age in the former country and its selective migration policies. In general, the authors conclude that relatively new immigrant-receiving countries, such as Denmark and Switzerland, are not yet capable of dealing with immigrants, even if they have very strict and selective migration policies. In some new immigrant-receiving societies, immigrants reach substantially lower levels of scholastic achievement than the natives of these states, in comparison to the differences between immigrants and natives in Australia, a traditional immigrant-receiving nation.

Levels and Dronkers (2008) did not, however, study the educational performance of the male and female children of immigrants. Even though successive papers with PISA 2003 data (Levels, Dronkers, & Kraaykamp, 2008) and PISA 2006 data (De Heus & Dronkers, 2010; Dronkers & De Heus, 2013) carried out far more sophisticated analyses by including macro-features of the origin and destination countries, possible gender differences in educational performance between the daughters and sons of migrants continued to be neglected. In addition, other researchers of the educational performance of migrant children with a double perspective (origin and destination) ignored possible differences between male and female pupils. Only recently has a group of researchers started to address these differences (Fleischmann & Kristen, in press), but they could only use national data for their cross-national analysis, thus limiting comparisons.

In contrast, this paper focuses on possible differences in the educational performance of the male and female children of migrants and uses the best available cross-national data to consider the necessary double perspective (origin and destination). We describe gender differences in the reading scores of the PISA 2009 wave and variations by origin and destination, controlling for the educational performance of native female and male pupils in their destination countries.

Another drawback of the above-mentioned papers on the educational performance of migrant children is the narrow scope of Western countries as destination. In contrast, this paper analyses the educational performance of the daughters and sons of migrants in countries across Asia, Europe, Latin America, Africa, and Oceania. We distinguish 62 origin countries and 12 origin areas in 30 destination countries. We also include internal migration from China to Hong Kong, Macao, and Shanghai.

This paper is organized as follows. After explaining the double perspective of origin and destination, we discuss briefly the cross-national research on gender gap in educational performance and formulate three hypotheses on deviant gender differences among migrant

pupils, and describing data, variables, and methods, we present ordinary least squares (OLS) regressions to test the three hypotheses. The last section discusses the results and their consequences.

Our results can be summarized as follows. Female migrant pupils outperform comparable male migrant pupils in reading and math. This outperformance by female migrant pupils is even larger than the "usual" reading and math differences between female and male native pupils. Parental socioeconomic background has an equal effect on the educational performance of daughters of migrants and on that of sons of migrants. This deviant gender gap for migrant pupils varies both by origin and destination country, but this variation cannot be explained by the level of "poverty and traditionalism" of the origin countries.

Multiple origins and destinations

Since immigration is intrinsically a transnational phenomenon, it should be studied accordingly (Portes, 1999). Immigrant parents and children from various countries of origin move to various countries of destination. Therefore, instead of relying on observations of multiple-origin groups in a single destination or single-origin groups in multiple destinations, our analyses compare multiple origins in multiple destinations simultaneously. Since this design disentangles the effects of the characteristics of the countries from which immigrants come (origin effects) and the characteristics of the countries to which they migrate (destination effects), it is extremely useful in gaining insight into the factors influencing immigrants' outcomes, such as educational performance. This paper is the first descriptive phase of our origin and destination analyses of the gender differences in educational performance of children of migrants. As Levels and Dronkers (2008), we start with a description of these gender differences in this paper. In a follow-up paper (Dronkers & Kornder, 2013) with a much smaller and restricted sample, we will include the macro-features of the countries of origin and destination and apply more sophisticated techniques, as in Levels et al. (2008) to explain the gender differences between the educational performances of 15-year-old children of migrants.

In this paper, we have both a more ambitious and simpler aim: We describe for the full sample of the PISA 2009 wave whether the gender difference in reading score of migrant pupils deviates from the gender difference between the native pupils in their destination countries.

Gender gap in educational performance

Gender variation in educational performance is a classic topic in the educational sciences. The expansion of the educational system and the gradual abolishment of gender barriers in the educational careers during the twentieth century should have abolished these gender variations, but resulted instead in a trend of female advantages in secondary education in Organisation for Economic Co-operation and Development (OECD) countries (for overviews, see Buchmann, DiPrete, & McDaniel, 2008; Van Langen, 2005). In most countries, female pupils tend to perform better in reading and male pupils in mathematics. This gender gap in reading favouring girls has increased over time. Thorndike (1973) found in the early 1970s almost no difference in reading achievement between adolescent boys and girls. Twenty years later, Wagemaker, Taube, Munck, Kontogiannopoulou-Polydorides, and Martin (1996) found that girls' overall performance in reading literacy was substantially higher than that of boys. The strength of these gender variations in educational performance

is not equal across countries. Marks (2007) analysed gender cross-nationally at the turn of the century with the PISA 2000 wave. He concluded that in most of the 31 countries girls, on average, have higher scores in reading (32 points) and lower scores in mathematics than boys (−11 points). Marks found a tendency for gender differences in reading to be larger in Scandinavian countries and East European countries and smaller in less economically developed countries such as Brazil or Mexico. Moreover, these gender differences in reading tended to be larger than the gender differences reported by Thorndike (1973) and Wagemaker et al. (1996). Marks found that gender differences in the distribution of pupils across grades and school programs contributed very little to the gender gap in reading across the compared countries. Even academic location does not produce further substantial declines in the gender gaps when taking individual schools into account. The two gender gaps in reading and mathematics were closely related at the country level. Marks found that countries with a larger gender gap in reading favouring girls tend to show smaller gender gaps in mathematics (see also Guiso, Monte, Sapienza, & Zingales, 2008). A great deal of research has tried to explain cross-national gender variations in reading and math scores. However, since a review of this line of research is outside the scope of this descriptive paper, we simply refer to the above-mentioned overviews. The focus of this paper is whether the gender variation in educational performance of migrant pupils deviates from the gender variation in educational performance of native pupils in their destination countries.

Gender gap in reading performance of migrant pupils

Gendered variation exists in the educational performance of the children of migrants (OECD, 2006, 2012), but until now this cross-national gendered variation has hardly been analysed. Moreover, the description of gendered variation in the educational performance of the children of migrants is mostly limited to single-country studies (Abada & Tenkorang, 2009), which do not always include the gendered variation in the educational performance of the native pupils (Feliciano & Rumbaut, 2005). We know only of Fleischmann and Kristen's (in press) study, which uses national data for a cross-national analysis of four indicators of the educational performance of male and female migrant children.

Our hypotheses build upon the general main arguments for gender inequalities in educational performance: gender role socialization and women's return to education.

The first main argument states that gender stereotypes and norms influence the socialization of boys and girls within families and educational institutions (Buchmann et al. 2008). Gender-biased perceptions of children's ability and performance by parents and/or teachers can be translated into biased educational expectations and educational experiences. They can also influence students' perception of their own abilities and their educational expectations, thereby creating a self-fulfilling prophecy. Gender socialization also contributes to gender differences in behaviour at school, for instance, girls' higher social skills and lower disruptiveness (Buchmann et al., 2008), and thus to different educational outcomes. These gender stereotypes and norms might differ by the origin of the migrants. Gender roles among migrants from origin countries with strong traditional cultures typically imply gendered task distributions where males are expected to second at the labour market and females at home. Female household duties and caring work in the migrant family might reduce the time available for migrant daughters for educational investments (Dion & Dion, 2001; Fuligni, Tseng, & Lam, 1999). But daughters of migrants from origin countries with a more modern outlook might be less hampered by traditional gender roles in their educational performance. However, traditional gender roles might also be helpful for the

educational performance of daughters of migrants. More household duties and closer monitoring of daughters might mean that girls spend more time at home and therefore invest more in their education, while a higher freedom outside the home might hamper the educational performance of the sons of migrants (Abada & Tenkorang, 2009). The closer supervision and stricter parental monitoring of the daughters of migrants from poorer, more traditional societies compared to their sons may strengthen the discipline of the daughters more, thus impacting their educational performance (Feliciano & Rumbaut, 2005; Zhou & Bankston, 2001). Finally, if migrant children do not adopt their parents' traditional gender ideology, the implications might be different for girls and boys. Attending higher education and economic independence are a means for migrant girls to turn against traditional gender roles, while migrant boys might more often resort to poor performance and resistance in school (Cammarota, 2004; Feliciano & Rumbaut, 2005). The consequences of traditional gender roles for deviant gender differences in reading scores of migrant pupils can be opposite.

The second main argument on gender inequalities in education refers to women's return to education. The increasing returns for women in terms of access and success at the labour market is often seen as the major reason for the disappearance or reversal of the gender gap in educational attainment (Breen & Goldthorpe 1997; DiPrete & Buchmann 2006). The reversal is related to shifts in the structure of the labour market, such as the declining gender wage gap, especially for women with high levels of human capital, and the decreasing occupational sex segregation (Buchmann et al., 2008). Female migrant pupils from origin countries with traditional gender roles experience a strong contrast in the payoff of educational performance: low in their origin countries versus high in their destination countries. This contrast between origin and destination can become a powerful motivator for migrant daughters to succeed in education (Abada & Tenkorang, 2009; Feliciano & Rumbaut, 2005), especially if she compares herself with women in the origin countries. Finally, destination countries with more open integration policies towards migrants (like Scotland or Norway) may allow traditional gender preferences among their immigrants to be continued, while more dirigiste systems (like Germany or Austria) provide a greater force for assimilation (Koopman, Michalowski, & Waibel, 2012). Moreover, female migrants in destination countries with strong equal opportunity for women and men policies (Norway or Finland) might find greater incentives for educational performance. Institutional conditions in destination countries can thus work in opposite directions.

Based on these different considerations, we formulate two hypotheses, which guide our analyses.

The first hypothesis is as follows: *The daughters of migrants from poorer, more traditional regions perform much better in reading than comparable sons of migrants from the same regions, while the daughters of migrants from more affluent and liberal regions perform slightly better in reading than comparable sons of migrants from the same regions, taking into account the performance of native female and male pupils in their destination countries*.

The religious and/or cultural traditions of poorer, more traditional origin societies are not the only reference point for the educational performance of the sons and daughters of migrants. The reading performance of the native population can also be such a point of reference. There is a strong gender bias in the language performance of males and females, and thus we have to distinguish between the reading performance of male and female native pupils. We assume that female migrant pupils profit more from such an external reference point, because it goes more against the religious and/or cultural traditions of their poorer, more traditional origin societies than for boys.

Therefore our second hypothesis is as follows: *The educational performance of the daughters of migrants is more influenced by the reading performance of female native pupils than the reading performance of the sons of migrants will be influenced by the reading performance of male native pupils*.

Data and variables

PISA 2009

Since 2000, the OECD has conducted large-scale tri-annual tests among 15-year-olds living in its member states and partner states to assess pupils' mathematical, reading, and scientific literacy. In doing so, the OECD has aimed to determine the extent to which pupils near the end of their compulsory education have acquired some of the knowledge and skills essential for full participation in society. Alongside information on pupils' educational performance, PISA also provides information on their individual characteristics (e.g., parental education and careers, resources available in the home, languages spoken at home, and the birth countries of both the parents and the pupil) through the administration of pupil and principal questionnaires. In this paper, we use the latest PISA wave, 2009 (OECD, 2010).

This study focuses on reading abilities (the dependent variable), which was the focus of the PISA 2009 wave. A 390-min pencil-and-paper test was developed. However, since it would not be sensible to administer a test of more than 6 hr to an individual pupil, 13 largely comparable item clusters of 2-hr duration each were derived from the core test. These test booklets were allocated to individual pupils according to a random selection process, requiring them to answer multiple-choice as well as open questions. In some countries, an additional 40-min test was administered covering tasks related to reading and understanding electronic texts.

Since two test booklets can never have exactly the same average difficulty, item response modelling was used to establish comparable reading results across pupils. Item response modelling involves the construction of several plausible reading values for each pupil. So, instead of obtaining just one score to indicate each pupil's reading ability, five possible reading score values were estimated per pupil. For each pupil, we averaged the five plausible values to calculate a composite score. The composite scores were standardized using an average of 500 and a standard deviation of 100.[2]

However, it is important to take into account that the PISA data have some important limitations, and that there has been a lot of criticism on the data and its use. Below, we just summarize the five limitations, which are most relevant for this paper (see, further, Mortimore, 2009).

(1) *Cultural differences*. For any programme of assessment, the challenge of having to treat students from over 50 nationalities in a common manner is daunting. Students from a range of cultural backgrounds may react in different ways to common questions and even to a common formal testing situation.
(2) *Translations.* There will also be differences in the way ideas can be translated. It is likely that some languages are more difficult than others; those with more regular grammatical constructions, for instance, may be less likely to generate reading or spelling problems. Furthermore, it must be recognised that some students will not be tested in their native language. This will apply to many first-generation immigrants but also to students in countries such as Luxembourg.

(3) *Sampling.* With any survey, there will always be questions about the representativeness of the selected sample. There are dangers that some countries will endeavour to increase the proportion of the most able students and decrease the proportion of those deemed to be the least able. The PISA guidelines address this topic in considerable detail (see http://www.oecd.org/pisa/pisaproducts/pisa2009manualsandguidelines.htm). Each country's sample is examined carefully and measured against agreed criteria. There are instances where it has been decided that the sample was not good enough – as with the rejection of the UK sample in 2003.
(4) *Disregard of national curricula*. The emphasis on asking questions which can be answered using common sense rather than knowledge of a particular curriculum has also been challenged. If PISA data are seen merely as a crude estimate of the performance of a nation's educational system and its attempts to achieve equity, the limitations of the curriculum being assessed may not matter.
(5) *The use of a cross-sectional design by PISA*. However, to make valid comparisons of the effects of different national systems of education or to imply causality, strictly speaking, it is necessary to have longitudinal data. Adopting a longitudinal design for at least part of the survey would strengthen the influence of PISA.

Pupils' country of origin and immigrant status

Since specific information on the country of birth of both the pupil and the parents is necessary to determine a pupil's country of origin, destination countries that did not allow enough specificity in birth countries were omitted. For instance, when asking about the country of origin, the USA only provided the options "United States of America" and "another country". Among destination countries that did provide enough variety in birth country options to be included in our analysis, the question was not consistently asked. In addition, PISA offered participating test countries the possibility of determining a set of answers in advance, allowing countries to include in the dataset their most important groups of immigrants. For instance, in the German questionnaires, the possible countries of origin were Croatia, Greece, Italy, Macedonia, Montenegro, Poland, Serbia, Slovenia, Turkey, and one of the former USSR republics, while New Zealand listed the options Australia, China, Republic of Korea, South Africa, the United Kingdom, and Samoa. Therefore, only data from 30 of the 67 participating countries were useful for the analysis.[3] However, contrary to previous studies, we did not limit ourselves to destination countries in Europe and the Pacific Rim but, instead, included Asian and Latin American countries.

To determine a pupil's *country of origin*, several decision rules were used, based upon the pupil's birth country and the birth countries of both parents. To capture as many respondents as possible, we also included 12 aggregate origin areas, which were sufficiently specific for the purpose of this analysis, as countries of origin. Most destination countries allowed for the selection of at least one aggregate origin area. For example, besides Germany, also Greece, Israel, and The Netherlands allowed for the origin selection "one of the former USSR republics". We combined these migrants in an equivalently labelled composite category. In addition to information on Chinese migrants in non-Chinese countries, our dataset also contains information on two internal migrant groups, from either westernized or Mainland China. Since internal migration in China is difficult and requires governmental approval, the Chinese who originate from Mainland China and move to Shanghai, Hong Kong, or Macau are considered internal immigrants in China. Additionally, internal migration between the major cities in and around China is labelled internal immigrants from westernized China. These migrants originate from Hong Kong,

Macau, or Chinese Taipei and live in Shanghai, Hong Kong, or Macau. In total, using decision rules to identify pupils' countries of origin and immigrant status yields a final sample of 16,612 female and 16,804 male migrant pupils originating from 62 different and 12 aggregate origin areas.

It is important to keep in mind that the country of birth of pupils and parents does not necessary reflect their original background. The migrant pupils in Turkey who are born in Germany might be families with a Turkish background that returned to Turkey. The same holds for migrant pupils from the USA in Australia and New Zealand: They might be secondary migrants.

The OECD allows participating countries to propose their own birth country categories, and some countries allow more detail than others. As a result, the origin countries of the different destination countries are partly dependent on the quality of the available categories. To account for this possible bias, we compared, as much as possible, the origin countries in PISA with national statistics. In most cases, the largest immigrant groups identified by the statistical offices are also represented in our PISA data. Since the PISA data do not oversample immigrant pupils, smaller immigrant groups (if asked for) are understandably not always present in our data. There are no indications that this selectivity (only the largest migrant categories of destination countries) has produced a bias, because small migrant categories in destination countries hardly influence the results.

Table 1 reports the distribution of migrants in all countries and areas of origin. To simplify the presentation of the analysis, we combined these countries of origin into 14 regions of origin based upon a slightly adjusted version of the United Nations Statistics Division's composition of macro geographical regions. The composition of origin regions is as follows: *North America*: the United States of America; *Caribbean*: the Caribbean and the Netherland Antilles; *South America*: Argentina, Bolivia, Brazil, Chile, Paraguay, Suriname, Uruguay, and Spanish America; *Northern Europe*: Denmark, Estonia, United Kingdom, and Sweden; *Western Europe*: Austria, Belgium, France, Germany, Liechtenstein, The Netherlands, and Switzerland; *Eastern Europe*: Belarus, the Czech Republic, Poland, Romania, the Russian Federation, the Slovak Republic, the Ukraine, one of the former USSR republics, and an Eastern European country outside the European Union (EU); *Southern Europe*: Albania, Bosnia and Herzegovina, Croatia, Greece, Italy, Macedonia, Montenegro, Portugal, Slovenia, Spain, and Serbia; *Northern Africa*: Egypt, Morocco, Algeria, and Tunisia; *Sub-Saharan Africa*: Cape Verde, Congo, Ethiopia, Somalia, South Africa, and an African country whose official language is Portuguese; *West Asia*: Iraq, Jordan, Lebanon, the Occupied Palestinian Territories, Turkey, Yemen, an Arabic region, and a Middle Eastern country; *South Asia*: Afghanistan, Bangladesh, India, Iran, and Pakistan; *East Asia*: China (external and internal) and the Republic of Korea; *Southeast Asia*: Malaysia, the Philippines, and Vietnam; *Oceania*: Australia, New Zealand, and Samoa.

After a pupil's country of origin, we identified his/her immigrant status. Pupils of whom at least one of the parents was born in a country different from the destination country were identified as immigrants. Migrant pupils were classified as *first generation* (reference category) when they were themselves born outside the destination country, and *second generation* when at least one of the parents was born abroad. This distinction between first- and second-generation migrants deviates from that of Portes and Rumbaut (2001), who classify migrant generation status based on age upon arrival in the destination country. However, we believe that this distinction is cross-nationally clearer and is less likely to underestimate the importance of pre-school socialization. Given their age of arrival, the majority of the first generation had the major part of their formal schooling only in the destination country.

Table 1. Known countries of origin in PISA 2009.

Countries of origin	Frequency	Percentage	Countries of origin	Frequency	Percentage
Afghanistan	68	0.20	Romania	37	0.11
Albania	371	1.11	Russian Federation	510	1.53
Argentina	75	0.22	Samoa	145	0.43
Australia	134	0.40	Slovak Republic	331	0.99
Austria	182	0.54	Slovenia	2	0.01
Bangladesh	3	0.01	Somalia	56	0.17
Belarus	192	0.57	South Africa	280	0.84
Belgium	174	0.52	Spain	194	0.58
Bolivia	93	0.28	Suriname	121	0.36
Bosnia and Herzegovina	1,333	3.99	Sweden	216	0.65
			Switzerland	89	0.27
Brazil	254	0.76	Turkey	1,501	4.49
Cape Verde	82	0.25	Ukraine	172	0.51
Chile	50	0.15	United Kingdom	1,900	5.69
Congo	270	0.81	United States of America	586	1.75
Croatia	184	0.55	Uruguay	31	0.09
Czech Republic	5	0.01	Vietnam	141	0.42
Denmark	56	0.17	Yemen	419	1.25
Egypt	636	1.90	African country with Portuguese as official language	667	2.00
Estonia	29	0.09			
Ethiopia	165	0.49			
France	997	2.98	Algeria, Morocco, Tunisia	342	1.02
Germany	1,143	3.42	Eastern European country outside the EU	29	0.09
Greece	38	0.11			
India	134	0.40	Arabic region	68	0.20
Islamic republic of Iran	12	0.04	Caribbean	4	0.01
			From former Yugoslavia migrated to Serbia	932	2.79
Iraq	138	0.41			
Italy	959	2.87	From Slovenia. Macedonia & Montenegro to Croatia	111	0.33
Jordan	268	0.80			
Republic of Korea	159	0.48	Middle Eastern Country	7	0.02
Lebanon	137	0.41	Netherlands Antilles	37	0.11
Liechtenstein	32	0.10	One of the former USSR republics	917	2.74
Former Yugoslav Macedonia	28	0.08			
			One of the former Yugoslav republics	1,327	3.97
Malaysia	4	0.01			
Morocco	136	0.41	Serbia and Montenegro	823	2.46
Netherlands	208	0.62	Spanish America	8	0.02
New Zealand	674	2.02	External immigrants from China to non-Chinese countries	423	1.27
Occupied Palestinian Territory	290	0.87			
			Internal immigrants from westernized China	287	0.86
Pakistan	117	0.35			
Paraguay	118	0.35	Internal immigrants in China	8,845	26.47
Philippines	230	0.69			
Poland	164	0.49			
Portugal	1,516	4.54	*Total*	*33,416*	*100.00*

Source: PISA 2009 (own computation; not weighted).

Migrant pupils whose generation could not be determined were taken into account by creating a *missing generation dummy variable*. Of the remaining respondents with sufficient information to be classified as natives, those pupils who spoke a foreign language

at home that allowed for a reasonable inference about the country of origin were reclassified as *third generation*. For instance, migrant pupils in Germany who spoke Turkish or Kurdish at home but were classified as native Germans were reclassified as third-generation immigrants from Turkey. Similarly, pupils in Australia who indicated they spoke Albanian, Bosnian, Croatian, or Serbian were regarded as third-generation migrants from "one of the former Yugoslav republics", even though the previous decision rules to identify countries of origin classified them as natives. As such, we did not capture a representative sample of third-generation immigrants since only those pupils who continued to speak at home a language other than the official language of the destination country could be identified. This category may be regarded as non-integrated immigrants despite their long presence in the destination country.

The more sophisticated analyses of the results section combine these generation variables with the indicator of the language spoken at home (see variables section) into seven dummy variables: first generation and official language, first generation and foreign language, first generation and unknown language, second generation and official language, second generation and foreign language, second generation and unknown language, and third generation and foreign language.

Individual-level variables

Table 2 summarizes all relevant variables and regions of origin, including the minimum and maximum scores and the mean and standard deviation for pupils with a migration background and a known country or area of origin.

We use a number of additional variables to account for the status of migrant pupils. First, we controlled for the parental environment of pupils by using the *index of the economic, social, and cultural status of the parents* (ESCS). This variable represents a composite index created in the PISA dataset of the occupational status of the parents (Ganzeboom, De Graaf, &Treiman, 1992), the educational level of the parents (United Nations Educational, Scientific and Cultural Organization, 2006), and the presence of any material or cultural resources at the pupils' homes.[4] This combination of the parents' occupational status and educational level, together with resources at home, produces the strongest indicator of the parental environment. If one or more of these variables were missing for a respondent, we imputed the ESCS value by taking the average of the prior and next pupil after sorting all cases based on the destination country, generation, country of origin, International Standard Classification of Education (ISCED), International Socio-Economic Index (ISEI), and home possessions. The ESCS score was standardized such that the OECD average was set to zero.

Second, we controlled for the effects of family structure on scholastic performance. Since a previous analysis revealed that migrant pupils from single-parent families perform worse, on average, than pupils with both parents (Dronkers & De Lange, 2012), we include a *nuclear family dummy variable* that measures whether children live in two-parent households. Those pupils with other family structures were the reference group.

Third, we included a dummy variable labelled *one parent born in destination country* to identify pupils who had one immigrant and one native-born parent; pupils with two non-native parents represented the reference group. This is a way of controlling for the effects of having a presumably stronger relation with the society and culture of the destination country when one parent is a native. A corresponding *mixed marriage missing dummy variable* was introduced to compare pupils for whom the birth country of one of the parents was missing with pupils for whom both parents are non-native.

Table 2. Summary of variables.

	Males				Females			
	Minimum	Maximum	*M*	*SD*.	Minimum	Maximum	*M*	*SD*.
Migrant 1 generation	0	1	0.29	0.45	0	1	0.26	0.44
Migrant 2 generation	0	1	0.69	0.46	0	1	0.72	0.45
Migrant 3 generation	0	1	0.02	0.13	0	1	0.02	0.13
Reading score	59.3	780.5	446.84	105.25	125.8	823.7	490.04	94.32
ESCS missing	−5.7	3.0	−0.16	1.07	−5.7	3.1	−0.24	1.05
ESCS (missing values imputed)	0	1	0.01	0.10	0	1	0.01	0.07
Nuclear family	0	1	0.75	0.43	0	1	0.76	0.43
Mixed marriage	0	1	0.47	0.50	0	1	0.48	0.50
Mixed marriage missing	0	1	0.07	0.26	0	1	0.06	0.23
Official language	0	1	0.69	0.46	0	1	0.73	0.44
Language information missing	0	1	0.07	0.25	0	1	0.06	0.23
Native reading score	311.2	536.3	461.25	49.02	365.4	574.1	500.64	46.66

Source: PISA 2009 (own computation; not weighted).

Fourth, we controlled for the effects of speaking a foreign language at home with the dummy variable *official language of destination country spoken at home*. This variable distinguishes between migrant children who speak one of their destination country's official languages at home and children who speak a foreign language. Again, a *language missing dummy variable* was taken into account to differentiate pupils whose language spoken at home is unknown with pupils who speak one of their destination country's official languages at home. The more sophisticated analyses of the results section combine these two language indicators with the generation indicators (see variables section).

Fifth, we assigned a *native reading score* – that is, the average PISA score of the corresponding native male or female population – as an additional variable to each migrant pupil. This variable serves to approximate the quality of the educational system in the destination country. To enable a more appropriate analysis of gender differences, the average score of native males was assigned to male immigrants. Conversely, the average score of native females was assigned to female immigrants. However, these native aggregated reading scores do no longer reflect the variability within each destination country in educational performance.

Methods

We apply OLS regression at the individual level with only the migrants' children, with their individual characteristics (including parental background and migration history) and dummies for the origin regions and destination countries. The only macro-indicator is the average educational performance of the male or female native population, which is used as a control for the quality of the education in the destination countries. Consequently, the coefficients are not influenced by differences in the educational system quality of destination countries. Therefore, the coefficients reflect purely the effect of a variable for pupils with a migration background in a destination country with the same quality of education. We apply the regressions separately for male and female pupils and use unstandardized coefficients, which make the results comparable because all variables are similarly coded for both sexes.

We estimate equations with the dummies of the destination countries, socioeconomic characteristics, and migration history as controls, equations that also include dummies for origin regions as controls and equations that include the native average score for the dependent variable. The combination of first generation and the official language is the reference category for the six combinations of generation and language spoken at home. Denmark, Norway, and Finland are the combined reference categories for the destination countries, and Northern Europe for origin regions. We use these countries and region as they have the greatest gender equality in educational performance among our sample countries and regions.

To avoid the dominance of certain destination countries on the outcome of the analyses due to differences in sample size and numbers of migrant pupils, we included a weighting factor in all OLS analyses such that all destination countries have the same number of migrant pupils. Each pupil was assigned a weighting factor equal to $500/x_j$, with x being the number of observed migrant pupils in their destination country j. For example, Swiss pupils constitute 10.63% of our dataset, with 3,553 respondents. In contrast, our sample of migrant pupils in Liechtenstein is limited to 210 respondents, that is, 0.63% of the total dataset. Thus, pupils in Switzerland are assigned a weight of $500/3{,}553 = 0.14$, whereas pupils from Liechtenstein are weighted with a factor of $500/210 = 2.38$. Given the average number of migrant pupils in destination countries (1,114), we generally

underweight the scores, which is our preferred method since the results will be more conservative and thus reliable. However, we deleted migrants to Indonesia and Turkey from the more sophisticated analyses of the results section because their numbers are too small (12/35) and they would thus be strongly overweighted.

Table 3 shows the various models for male and female pupils separately, with reading score as the dependent variable.

Results

Socioeconomic characteristics and migration history (Model 1)

Model 1 in Table 3 includes destination countries, socioeconomic characteristics, and migration history variables, for males and females, separately. The constant of these models reflects the score of first-generation pupils who speak the official language of their destination country, with an ESCS score of zero,[5] both parents having been born outside the destination country, not living in a nuclear family, and living in Denmark, Finland, or Norway. The results of Model 1 are without any control for the origin of pupils with a migrant history and can therefore be misleading. Differences between the coefficients of Model 1 and Models 2 and 3 reflect the importance of including the origins of migrant children and the quality of education in the destination countries to predict their educational performance.

Female pupils have much higher reading scores (54 = 488 – 434) in Model 1 than male pupils under the same socioeconomic conditions and with the same migrant history and destination country. This female advantage in reading scores may be a consequence of the generally higher reading scores of female pupils, irrespective of whether they have a migrant history or are native pupils.

The parameters for first generation with a foreign language at home are more or less equal for males (−22) and females (−24). The same holds for the two combinations of second generation and language at home, since they are also roughly the same for both genders. The improvement of zero to 4 points for second generation with the official language in comparison with the reference category is insignificant. Third-generation pupils are only those who still speak a foreign language while they and their parents were both born in the destination country. The reading scores of these non-integrated third-generation males are insignificantly lower (−12) than that of first-generation male pupils who speak the official language at home. In contrast, third-generation female counterparts score 28 points lower than first-generation female pupils who speak the official language at home. Thus, there are only gender differences in the reading scores of third-generation pupils who speak a foreign language, to the disadvantage of female pupils.

Similarly, the effect of having mixed parents is more or less the same for males and females (higher score of 6 or 5 points). This is not true for living in a nuclear family instead of another family type. The positive effect of a nuclear family is greater for males than for females (24 points higher versus 14 points), and this difference of 10 points remains constant in Models 2 and 3.

Finally, the parental social background has significant and very similar effects on the scholastic performance of both sexes. As would be expected, an increase of one unit in the ESCS indicator is associated with an increase in performance between 29 and 30 points, regardless of the pupil's gender.

The negative effect of missing values on these individual variables, as measured with the dummies, is, on average, greater for females than for males. One could assume that

Table 3. Unstandardized effects of social background and region of origin on the reading scores of male and female migrants, controlling for destination country.

	Males			Females		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	433.67*	437.43*	6.71	488.03*	502.51*	256.21*
	(4.52)	(4.98)	(149.48)	(4.21)	(4.80)	(90.78)
Social background with 1st generation official language as reference						
Migrant 1 gen foreign language	−22.03*	−24.10*	−23.78*	−23.64*	−25.37*	−26.00*
	(4.31)	(4.43)	(4.43)	(4.05)	(4.11)	(4.12)
Migrant 1 gen missing language	−60.97*	−59.69*	−59.19*	−65.20*	−62.1*	−61.43*
	(7.48)	(7.46)	(7.46)	(7.68)	(7.62)	(7.63)
Migrant 2 gen official language	4.27	5.57	5.83	0.77	2.70	2.91
	(3.02)	(3.02)	(3.02)	(2.87)	(2.86)	(2.86)
Migrant 2 gen foreign language	−24.26*	−20.88*	−20.63*	−21.09*	−15.89*	−15.69*
	(4.09)	(4.24)	(4.24)	(3.86)	(3.95)	(3.95)
Migrant 2 gen missing language	−53.08*	−49.07*	−48.66*	−55.65*	−48.58*	−48.07*
	(5.32)	(5.40)	(5.40)	(5.13)	(5.18)	(5.18)
Migrant 3 gen foreign language	−11.76	−11.71	−11.28	−28.29*	−27.93*	−28.25*
	(8.01)	(7.99)	(7.99)	(7.60)	(7.54)	(7.54)
Nuclear family	23.83*	24.49*	24.67*	14.41*	14.91*	15.07*
	(2.39)	(2.38)	(2.38)	(2.24)	(2.22)	(2.22)
ESCS	29.01*	27.55*	27.58*	30.16*	28.01*	27.93*
	(1.05)	(1.06)	(1.06)	(0.97)	(0.99)	(0.99)
ESCS missing	−56.05*	−52.48*	−52.25*	−85.50*	−77.26*	−76.57*
	(9.70)	(9.69)	(9.68)	(12.95)	(12.85)	(12.84)
Mixed parents	6.00	4.90	4.65	5.32	0.99	0.61
	(2.55)	(2.63)	(2.63)	(2.33)	(2.39)	(2.40)
Mixed parents missing	−7.11	−7.15	−6.93	−6.86	−8.74	−8.68
	(4.28)	(4.28)	(4.28)	(4.16)	(4.13)	(4.13)

(*Continued*)

Table 3. Continued.

	Males			Females		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Regions of origin with Northern Europe as reference						
South America		−12.19	−10.21		−29.41*	−22.92
		(11.33)	(11.34)		(10.11)	(10.38)
North America		48.89*	48.96*		9.70	13.43
		(15.51)	(15.5)		(11.62)	(11.7)
Caribbean		−58.87*	−56.18*		−56.07*	−48.35*
		(15.72)	(15.74)		(16.76)	(17.00)
Western Europe		7.45	9.54		0.38	7.24
		(7.49)	(7.52)		(6.80)	(7.25)
Eastern Europe		10.68	9.44		−1.13	2.02
		(6.90)	(6.91)		(6.33)	(6.43)
Southern Europe		−6.08	−4.32		−13.56	−6.93
		(7.15)	(7.18)		(6.52)	(6.96)
Northern Africa		−0.11	2.48		−23.64*	−15.91
		(9.05)	(9.09)		(8.14)	(8.62)
Sub-Saharan Africa		−11.37	−9.79		−24.21*	−18.86
		(8.01)	(8.02)		(7.35)	(7.61)
Oceania		−36.59*	−36.01*		−23.26*	−21.38*
		(9.16)	(9.16)		(8.31)	(8.33)
West Asia		−24.83*	−21.56*		−47.08*	−38.25*
		(6.29)	(6.39)		(5.70)	(6.56)
South Asia		−9.36	−5.97		−28.35*	−19.90
		(9.19)	(9.26)		(8.45)	(9.00)
East Asia		31.37*	32.77*		22.19*	26.70*
		(8.58)	(8.58)		(8.42)	(8.57)
Southeast Asia		24.57	23.89		36.92*	39.61*
		(12.99)	(12.99)		(11.49)	(11.53)
Native scores						
Native reading score			0.88*			0.45*
			(0.30)			(0.17)
Adjusted R^2	0.332	0.342	0.343	0.347	0.363	0.363

Source: PISA 2009 (own computation, weighted); * indicates significance at the 1% level. Model 1 includes social background, Model 2 adds origin regions, and Model 3 adds native scores. The country of destination is controlled for in all models.

pupils who do not or cannot provide this information have unmeasured characteristics that are harmful to educational performance.

Origin regions (Model 2)

In Model 2, we add the origin regions to the equation with socioeconomic characteristics, migration history variables, and countries of destination. The reference origin region is Northern Europe, which, in this analysis, contains pupils originating from Sweden, Denmark, and Estonia. The inclusion is important because migration is not a random process but, instead, connects destination and origin countries by historical, cultural, and economic ties, which increase the chance of migration between the connected countries.

Female pupils from South America perform worse than comparable female pupils from Northern Europe (−29), and the same holds for female pupils from Northern Africa (−24), Sub-Saharan Africa (−24), and South Asia (−28). Male pupils from North America perform better than comparable male pupils from Northern Europe (49). Female pupils from South-east Asia perform better than comparable female pupils from Northern Europe (37). Male and female pupils from the Caribbean perform worse than comparable pupils from Northern Europe (−59 and −56, respectively), and the same holds for male and female pupils from Oceania (−37 and −23, respectively) and West Asia (−25 and −47, respectively). Male and female pupils from East Asia perform better than comparable pupils from Northern Europe (31 and 22, respectively).

The addition of the origin regions hardly changes the strength of the generation variables or the strength of most of the coefficients of the socioeconomic characteristics and migration history variables and does not change their direction. The increase in R^2 with the addition of origin regions is small (1% for males and 2% for females), but, given the already included independent variables in Model 2, a large increase is nearly impossible. So, the origins of migrants are not trivial features that can be neglected in any serious scientific or policy analysis. However, it is important to note that the coefficients of the origin regions (but not their positive or negative sign) change slightly for both male and female pupils after adding the native reading score in Model 3. This change reflects the unequal distribution of migrants from specific regions among the different destination countries with different quality educational systems.

Average native scores of the dependent variable (Model 3)

In Model 3, we add the average native scores of the dependent variable to the equation with socioeconomic characteristics, migration history variables, destination country dummies, and origin region dummies. The equation now reflects the scores of first-generation pupils from Northern Europe who speak the official language at home relative to the average educational performance of native pupils of the same gender in their destination country.

The parameters of the native reading scores are positive in all models but remain below 1. This means that the average reading score of pupils with a migration background is higher in destination countries where the average native pupil's score is higher (which reflects a higher quality educational system). Thus, first-generation male pupils from Northern Europe who speak the official language at home, with a zero ESCS score, in a destination country with an average male native pupil score[6] have a reading score of 412 (= 7[7] + (0.88[8] * 461[9] = 405)), while comparable first-generation female pupils from Northern Europe who speak the official language at home, with a zero ESCS score, in a destination country with an average female native pupil score[10] have a reading score of

481 (= 256[11] + (0.45[12] * 501[13] = 225)). These reading scores increase respectively by 6 and 3 points to 421 or 478 for second-generation, official language-speaking male and female pupils, respectively by 25 and 15 points to 430 or 490 for first-generation, official language-speaking male and female pupils living in a nuclear family, and respectively by 5 and 1 points to 410 or 476 for male and female first-generation, official language-speaking pupils with one parent born in the destination country. This supports the first part of our first hypothesis, because female pupils (migrant background or native) have higher reading scores, even if we consider that native female pupils also have higher reading scores (40 points = 501[14] − 461[15]).

The effect of the average reading performance of male native pupils is stronger on the reading scores of male migrant pupils (0.88) than the analogous effect for female migrant pupils (0.45). This contradicts our third hypothesis.

The addition of the native reading score to the equations of Model 3 does not change the coefficients of the origin countries by much compared to the same parameters of Model 2, but some become insignificant (at the 1% level). Male pupils from North America perform better than comparable male pupils from Northern Europe (49). Female pupils from Southeast Asia perform better than comparable male pupils from Northern Europe (40). Male and female pupils from the Caribbean perform worse than comparable pupils from Northern Europe (−56; −48), and the same holds for male and female pupils from Oceania (−36; −21), and West Asia (−22; −38). Male and female pupils from East Asia perform better than comparable pupils from Northern Europe (33; 27). These results underline the importance of taking into account origin countries if one wishes to understand the differences in the educational performance of pupils with a migrant background.

The higher performance of female pupils originating from poorer, more traditional societies (Hypothesis 1)

Based on Model 3 of Table 3, we computed in the previous section that male first-generation pupils from Northern Europe who speak the official language at home, with a zero ESCS score, in Denmark, Norway, or Finland have a reading score of 412, while comparable first-generation female pupils from Northern Europe in the same destination countries have a reading score of 481. This means that we can accept the first part of our first hypothesis for migrant pupils from Northern Europe. The reading test scores of female migrant pupils are 69 points higher than for comparable male migrant pupils, while the difference for native pupils is 40.

Our first hypothesis also states that daughters of migrants coming from poorer, more traditional regions perform much better in reading than comparable sons of migrants from the same regions, while the daughters of migrants from more affluent and liberal regions perform slightly better in reading compared to the sons of migrants from the same regions, taking into account the performance of native female and male pupils in their destination countries and the higher reading scores of female native pupils. We use the origin region parameters of Model 3 of Table 3 to test this hypothesis. If our hypothesis is correct, the female–male differences in the strength of the origin parameters should be positive for the poorer, more traditional regions and negative for richer, more liberal societies. The differences between the female and male parameters are as follows, in descending order: Southeast Asia, +16; Oceania, +15; the Caribbean, +8; Western Europe, −2; Southern Europe, −3; East Asia, −6; Eastern Europe, −7; Sub-Saharan Africa, −9; South America, −13; South Asia, −14; West Asia, −17; Northern Africa, −18; and North America, −36.

This order of female–male differences in the strength of the origin parameters does not support the second part of our hypothesis. Although Malaysia, the Philippines, and Vietnam (the available origin countries of the Southeast Asian region) are not the richest or most liberal societies, neither are they the poorest nor most traditional. This is even more so for Australia, New Zealand, and Samoa (the available origin countries of the Oceania region). The United States (the only available origin country of the Northern America region) is perhaps the richest and most liberal society, but this is not true for Northern Africa, West Asia, South Asia, or South America. Thus, this variance in the female–male differences in the strength of the origin region parameters does not reflect a general level of prosperity or liberty. This rejection of the second part of the first hypothesis does not mean that the female migrant pupils have lower reading scores than their male counterparts, because we have shown in the previous section that the average female–male reading score difference is 69, which is greater than for natives (40). Our rejection means that this difference is not simply influenced by the poverty and traditionalism of origin societies.

The stronger influence of native females on the performance of female migrant pupils (Hypothesis 2)

Our second hypothesis says that the educational performance of the daughters of migrants is more influenced by the performance of female native pupils than the performance of the sons of migrants will be influenced by the performance of male native pupils. Model 3 rejects this third hypothesis. The effect of a higher average score of male native pupils on the reading score of male migrant pupils is 0.88, while the effect of a higher average score of female native pupils on the reading score of female migrant pupils is 0.45. Therefore, female migrant pupils profit less from the higher average reading score of native females than male migrant pupils do from the average reading performance of native males.

Conclusions

This article investigates three hypotheses related to gender-specific differences in educational performance between 16,612 daughters and 16,804 sons of migrants from 14 regions, including 62 origin countries and 12 origin areas. Focusing on gender differences, with the help of PISA 2009, this paper fills a gap in the research on the cross-national educational performances of migrant children and forms the first part of a series of papers that contribute to a wider understanding of factors from various levels of analysis that influence these differences in male and female migrant scholastic performances. We use OLS regressions with individual-level characteristics as well as dummies for regions of origin and destination countries. We also include the average performance of the native population to control for differences in educational system quality between destination countries.

As a possible consequence of a religiously and/or culturally motivated male bias in poorer, more traditional countries on the scholastic performance of daughters of migrants in more affluent and liberal countries (where such a male bias is weaker), our first hypothesis assumes that *the daughters of migrants from poorer, more traditional regions perform much better in reading than the comparable sons of migrants from the same regions, while the daughters of migrants from more affluent and liberal regions perform slightly better in reading than comparable sons of migrants from the same regions, taking into account the performance of native female and male pupils in their destination countries and the higher reading score of female native pupils.* Our results support the first part of this hypothesis, since female migrant pupils of all origins outperform their comparable male counterparts in

reading by 69 points. If we subtract the average difference in reading between female and male native pupils (40), the "pure" reading performance of female migrant girls is higher by only 29 points. Thus, the gender gap is different for migrants than for native pupils. However, only in the destination countries Israel and Scotland, this reading advantage is partly neutralized. In addition, coming from the region North America (−36) neutralizes this superior reading performance. Thus, in general, the daughters of migrants from the other regions perform better in reading than the comparable sons of migrants, taking into account the performance of native female and male pupils in their destination countries and the higher reading score of female native pupils. The deviant gender gap for migrants varies both by origin and destination.

However, the second part of the first hypothesis (this superior performance being related to the level of poverty and traditionalism of the origin region) is not upheld by our results. The differences between the female and male parameters for each origin region are, in descending order, as follows: Southeast Asia, Oceania, the Caribbean, Western Europe, Southern Europe, East Asia, Eastern Europe, Sub-Saharan Africa, South America, South Asia, West Asia, Northern Africa, and North America. This order of female–male differences in the strength of the origin parameters does not support the second part of our hypothesis.

Although Malaysia, the Philippines, and Vietnam (the available origin countries of the Southeast Asian region) are not the richest or most liberal societies, neither are they the poorest or most traditional. This is even more so for Australia, New Zealand, and Samoa (the available origin countries of the Oceania region). The United States (the only available origin country of the Northern America region) is perhaps the richest and most liberal society, but this is not so for the Northern African (Algeria, Morocco, Tunisia) and West Asian (Iraq, Jordan, Turkey, Yemen) regions. Our follow-up paper (Dronkers & Kornder, 2013) addresses this rejection of the explanation of "poverty and traditionalism of the origin" by introducing macro-indicators for the position of women in the various origin countries (instead of region), as well as other macro-indicators.[16]

Since the daughters of migrants are more dependent on parental permission to participate in the social life of their destination countries, we assume in our second hypothesis that *parental socioeconomic background has a stronger effect on the educational performance of the daughters of migrants than on the performance of the sons of migrants*. However, the coefficients of parental socioeconomic background do not vary much and thus contradict our second hypothesis.

Since native gender performance may serve as a reference point for immigrant sons and daughters, our third hypothesis states that *the educational performance of the daughters of migrants is more influenced by the performance of female native pupils than the education performance of the sons of migrants is influenced by the performance of male native pupils.* We do not find any support for this hypothesis, because the effects of the educational performance of male native pupils on the performance of male migrant pupils are greater than the effects of the educational performance of female native pupils on the performance of female migrant pupils. In other words, male migrant pupils profit relatively more from the quality of the educational system of their destination countries than female migrant pupils. We propose a competitive hypothesis that male migrant pupils require more structure in their socialization in the destination countries than female migrant pupils and thus profit more from the quality of the educational systems (Dronkers & De Lange, 2012).

On a whole, our results about the deviant gender gap for migrant pupils suggest that daughters of migrants will disproportionally profit from parental migration in comparison with their brothers. If a high educational performance by migrant pupils is a condition of a

successful integration into destination societies, women might fulfil that condition better than their brothers. However, it remains to be seen whether this deviant gender gap is promoted by certain school characteristics. Migrants' children are unequally distributed across tracks and schools in their destination countries and often concentrated in specific schools with deviant features. In most cases, these school features have negative consequences for their educational performance, like higher levels of teacher shortage or a low socioeconomic school composition (see for a detailed analysis of the combination of characteristics of origins, educational systems, tracks, schools and migrant pupils, Dronkers & Levels, 2007; Dronkers, Van der Velden, & Dunne, 2012). However, it is implausible that this unequal distribution of migrant pupils across tracks and school differs also systematically between the sons or daughters of migrants. But it might be possible that the strength of the effects of school and educational system features is larger for sons of migrant than for daughters of migrants. Our rejection of the second hypothesis suggests that sons of migrants are more influenced by the quality of their educational environment than daughters of migrants. One of the next steps should be analysis of the combination of characteristics of origins, educational systems, tracks, schools, and pupils for sons and daughters of migrants, separately.

To provide more robust tests of the gender differentiation in educational performance of migrant pupils, information from a larger number of liberal and affluent destination countries is necessary. Given the importance of migrant children's success in education, it is unfortunate that destination countries such as Canada, France, England, the United States, and Sweden do not collect and make available the information needed for such an analysis, which limits our sample's comparability strength to some extent. In an unpublished analysis (results available upon request), we compared the educational performance of migrant pupils in OECD countries with and without detailed information about their parents' and their own birth countries. We found that the strength of relevant variables such as parental background, migrant generation, and home language was the same in both groups of OECD countries. This suggests that the forced selection of OECD countries in our analysis does not bias our results in comparison with all OECD countries. This conclusion might also be true for the wider variation of test countries, participating in PISA 2009.

Finally, there may exist an unmeasured selectivity of migrants (and thus their children) related to the levels of gender equality in their origin countries. Migrants from origin countries with very low gender equality can have a higher unmeasured ability (e.g., intelligence, personality) than migrants from origin countries with greater gender equality, due to the greater hurdles the former must overcome to settle in more liberal and affluent countries. This greater ability will not be reflected by their educational levels (which is included in the variable ESCS), due to the low average level of education in their origin countries. However, it is implausible that this selectivity differs between the parents of sons or daughters; thus, this inclusion will not change the gender variation in educational performance analysed in this article.

Notes

1. The second author was a master student at the School of Business and Economics of Maastricht University and wrote a first version of this paper as his research project. The first author is the project's supervisor and professor at Maastricht University; he wrote the later versions of this paper. A more elaborate research memorandum of additional analyses is available at www.roa.unimaas.nl/pdf_publications/2012/ROA_RM_2012_4.pdf

2. We also used math score of the male and female migrant children as dependent variable in our elaborated analyses (www.roa.unimaas.nl/pdf_publications/2012/ROA_RM_2012_4.pdf). The results about the deviant gender differences in educational performance in comparison with native pupils are substantially the same for reading as for math. Due to lack of space, we have to limit ourselves to the reading score as dependent variable.
3. In an unpublished analysis, we compared the educational performance of migrant pupils in OECD countries with and without detailed information about their parents' and their own birth countries. We found that the strength of relevant variables such as parental background, migrant generation, and home language was the same in both groups of OECD countries.
4. The measure consists of the presence of a desk, a private room, a quiet place to study, a computer, educational software, Internet access, 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.
5. The average ESCS score of pupils with a migrant background is not zero but −0.27.
6. The average native male score for all our destination countries is 461.
7. Constant of Model 3 in Table 3 for males.
8. Coefficient of Native Reading Score in Model 3 in Table 3 for males.
9. Average native male score for all our destination countries.
10. The average native female score for all our destination countries is 501.
11. Constant of Model 3 in Table 3 for females.
12. Coefficient of Native Reading Score in Model 3 in Table 3 for females.
13. Average native female score for all our destination countries.
14. Average native female score for all our destination countries.
15. Average native male score for all our destination countries.
16. As done in Dronkers and De Heus (2013) without the gender distinction.

Notes on contributors

Jaap Dronkers currently holds the chair international comparative research on educational performance and social inequality at the Maastricht University. Personal homepage: http://www.roa.unimaas.nl/cv/dronkers/nw_dronkers.htm

Nils Kornder has graduated as master student at the School of Business and Economics of Maastricht University.

References

Abada, T., & Tenkorang, E. Y. (2009). Gender differences in educational attainment among children of Canadian immigrants. *International Sociology*, *24*, 580–608.

Breen, R., & Goldthorpe, J. H. (1997). Explaining educational differentials: Towards a formal rational action theory. *Rationality & Society*, *9*, 275–305.

Buchmann, C., DiPrete, T. A., & McDaniel, A. (2008). Gender inequalities in education. *Annual Review of Sociology*, *34*, 319–337.

Cammarota, J. (2004). The gendered and radicalized pathways of Latina and Latino youth: Different struggles, different resistances in the urban context. *Anthropology & Education Quarterly*, *35*, 53–74.

Castles, S., & Miller, M. J. (2003). *The age of migration: International population movements in the modern world*. New York, NY: Guilford Press.

De Heus, M., & Dronkers, J. (2010). De onderwijsprestaties van immigrantkinderen in 16 OECD-landen. De invloed van onderwijsstelsels en overige samenlevingskenmerken van zowel herkomst- als bestemmingslanden [The educational performance of immigrant children in 16 OECD countries. The influence of educational systems and other societal features of both countries of origin and destination]. *Tijdschrift voor Sociologie*, *31*, 260–294.

Dion, K. K., & Dion, K. L. (2001). Gender and cultural adaptation in immigrant families. *Journal of Social Issues*, *57*, 511–521.

DiPrete, T. A., & Buchmann, C. (2006). Gender-specific trends in the value of education and the emerging gender gap in college completion. *Demography*, *43*, 1–24.

Dronkers, J., & De Heus, M. (2013). Immigrant children's academic performance: The influence of origin, destination, and community. In H.-D. Meyer & A. Benavot (Eds.), *PISA, power and policy: The emergence of global educational governance* (pp. 247–265). Oxford, UK: Symposium Books.

Dronkers, J., & De Lange, M. (2012). Is er een toenemende negatieve relatie tussen alleenstaande moedergezinnen en onderwijsprestaties bij stijgende percentages eenoudergezinnen? Een vergelijking van PISA 2000, 2003 en 2009 [Is there an increasing negative relation between single motherhood and educational performance by increasing percentages single-parent families? A comparison of PISA 2000, 2003 and 2009]. *Tijdschrift voor Sociologie*, *33*, 211–238.

Dronkers, J., & Kornder, N. (2013). *Can gender differences in the educational performance of 15-year old migrant pupils be explained by the gender equality in the countries of origin and destination* (ROA Research Memorandum 2013/5). Retrieved from http://www.roa.unimaas.nl/pdf_publications/2013/ROA_RM_2013_5.pdf

Dronkers, J., & Levels, M. (2007). Do school segregation and school resources explain region-of-origin differences in the mathematics achievement of immigrant students? *Educational Research and Evaluation*, *13*, 435–462.

Dronkers, J., Van der Velden, R., & Dunne, A. (2012). Why are migrant students better off in certain types of educational systems or schools than in others? *European Educational Research Journal*, *11*, 11–44.

Feliciano, C., & Rumbaut, R. G. (2005). Gendered paths: Educational and occupational expectations and outcomes among adult children of immigrants. *Ethnic and Racial Studies*, *28*, 1087–1118.

Fleischmann, F., & Kristen, C. (in press). Gender gaps in the education of the second generation. In A. Heath & Y. Brinbaum (Eds.), *Unequal attainments. Ethnic educational inequalities in ten Western countries*. Oxford, UK: Proceedings of the British Academy.

Fuligni, A. J., Tseng, V., & Lam, M. (1999). Attitudes toward family obligations among American adolescents with Asian, Latin American, and European backgrounds. *Child Development*, *70*, 1030–1044.

Ganzeboom, H. B. G., De Graaf, P., & Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social Science Research*, *21*, 1–56.

Guiso, L., Monte, F., Sapienza, P., & Zingales, L. (2008). Culture, gender, and math. *Science*, *320*, 1164–1165.

Koopman, R., Michalowski, I., & Waibel, S. (2012). Citizenship rights for immigrants. National paths and cross-national convergence in Western Europe, 1980–2008. *American Journal of Sociology*, *117*, 1202–1245.

Levels, M., & Dronkers, J. (2008). Educational performance of native and immigrant children from various countries of origin. *Ethnic and Racial Studies*, *31*, 1404–1425.

Levels, M., Dronkers, J., & Kraaykamp, G. (2008). Immigrant children's educational achievement in Western countries: Origin, destination, and community effects on mathematical performance. *American Sociological Review*, *73*, 835–853.

Marks, G. N. (2007). Accounting for the gender gaps in student performance in reading and mathematics: Evidence from 31 countries. *Oxford Review of Education*, *34*, 89–109.

Mortimore, P. (2009). *Alternative models for analysing and representing countries' performance in PISA*. Brussels, Belgium: Education International Research Institute.

Organisation for Economic Co-operation and Development. (2006). *Where immigrant students succeed. Pisa 2003*. Paris: Author.

Organisation for Economic Co-operation and Development. (2010). *PISA 2009 results: What students know and can do*. Paris: Author.

Organisation for Economic Co-operation and Development. (2012). *Untapped skills. Realising the potential of immigrant students*. Paris: Author.

Portes, A. (1999). Conclusion: Towards a new world – The origins and effects of transnational activities. *Ethnic and Racial Studies*, *22*, 463–477.

Portes, A., & Rumbaut, R. G. (2001). *Legacies: The story of the immigrant second generation*. Berkeley, CA: University of California Press.

Thorndike, R. L. (1973). *Reading comprehension education in fifteen countries: An empirical study*. New York, NY: Wiley.

United Nations Educational, Scientific and Cultural Organization. (2006). *ISCED 1997: International Standard Classification of Education* (Re-Edition). Paris: Author.

Van Langen, A. (2005). *Unequal participation in mathematics and science participation*. Antwerp, Belgium: Garant.

Wagemaker, H., Taube, K., Munck, I., Kontogiannopoulou-Polydorides, G., & Martin, M. (1996). *Are girls better readers? Gender differences in reading literacy in 32 countries*. Delft, The Netherlands: Eburon.

Zhou, M., & Bankston, C. L., III (2001). Family pressure and the educational experience of the daughters of Vietnamese refugees. *International Migration*, *39*(4), 133–151.