Chapter 3
The School Performance of the Russian-Speaking Minority in Linguistically Divided Educational Systems: A Comparison of Estonia and Latvia

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3.1 Introduction

Ethnic inequalities in education are characteristics of many European societies (Heath and Brinbaum 2007; Heath et al. 2008). Several studies have reported that the school performance differs significantly between the native and the immigrant population (Marks 2005; Schnepf 2007; Levels and Dronkers 2008). In a comparison of different Western European countries, Heath et al. (2008) conclude that the ethnic disadvantage in education is particularly visible in school performance, even though the educational choices of ethnic minorities might be even more ambitious compared to the majority. The different educational achievements of ethnic groups are often attributed to social background and aspirations. However, the school context may also account for the lower achievement of ethnic minority pupils (e.g. Portes and Hao 2004).

Although many studies have explored the ethnic differences in educational performance in Western European countries, this is a much less researched topic in Eastern European societies. This chapter focuses on the educational achievement of the Russian-speaking minority in Estonia and Latvia. In these countries, the inflow of Russian-speaking immigrants was large during entire Soviet period (1944–1991). Since that time, schools in Estonia and Latvia have been divided on the basis of the language of instruction. Therefore, Russian-speaking pupils have the opportunity to study in their native language, although currently teaching is also partly conducted in the majority language at these schools. In the literature, the effect of bilingual education on the educational success has received little attention thus far (Esser 2006). Some previous studies have focused on the

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influence of multilingual teaching on the academic success of ethnic minority children (e.g. Greene 1998). However, the scope of the aforementioned research rather comprises language immersion programs at schools than educational systems divided on the basis of language. It is thus an important question whether the specific institutional arrangement of dividing the educational system according language of instruction has an impact on ethnic inequality in performance.

This chapter explores the performance of pupils studying at schools in Estonia and Latvia with the majority language or Russian as language of instruction. The central research questions are (1) whether the opportunity to study in own mother tongue promotes the achievement of minority students and (2) how math performance is related to the individual social background, achievement motivation and the school context in linguistically divided educational systems. These questions are important from the theoretical perspective since previous literature on the integration of ethnic groups has predominantly overlooked the effects of linguistically divided educational systems.

The ambition is also to explore how specific societal contexts shape the achievement of minorities in schools with a different language of instruction. The immigration history of Russian-speakers was rather alike in Estonia and Latvia. However, compared to Latvia, the intermarriage rate between ethnic groups is lower in Estonia and communities are more separated socially. The Russian-speaking minority in Estonia is less dispersed geographically than in Latvia. In addition, the socio-economic differences between the ethnic communities are larger in Estonia than in Latvia (Hazans 2010; Rozenvalds 2010). Nevertheless, in both countries, issues related to minority schools were one of the most debated aspects of the educational reforms. In particular, the recent transition to bilingual teaching in Russian-medium schools has raised the questions about the quality of education in these schools.

In this study, data from OECD's PISA 2006 study is used which enables researchers to compare pupils' mathematical performance while taking into account the language spoken at home and the language of instruction at school. The analysis is conducted using multi-level techniques.

3.2 Background

3.2.1 Ethnic Minorities in Estonia and Latvia

Estonia and Latvia became hosts to a sizeable Russian-speaking minority after World War II. The inflow of Soviet military persons started immediately after the incorporation into the Soviet Union. In addition, the inflow of labour migrants was high during entire Soviet period as a result of a specific industrialisation policy. Mostly, Russian-speakers were arriving from Russia, Ukraine and Belarus. The ethnic composition of the populations of Estonia and Latvia changed significantly.

The share of people identifying themselves as ethnic Estonians in Estonia decreased from 88 % in 1934 to 62 % in 1989. In Latvia, the number of ethnic Latvians dropped from 77 % in 1935 to 52 % in 1989. However, the proportions of natives have increased during last decades to 59 % in Latvia and to 69 % in Estonia (Central Statistical Bureau of Latvia 2010; Statistics Estonia 2010).

In both countries, the differences between the ethnic majority and the Russian-speaking minority are not very large in terms of age and gender distribution, average household size and education level. However, it has been argued that the differences between the native and the Russian-speaking communities are larger in Estonia than in Latvia (Aasland and Fløtten 2001). In Estonia, the residential location, division of labour and institutional ties overlapped with ethnic and language boundaries during the Soviet period (Hallik 2002). Although, a policy of segregation was also practised in Latvia (Priedīte 2005), there was more social interaction between the ethnic groups both at work and outside of work. Higher numbers of Russian-speakers in Latvia could speak the local language, and there were more interethnic marriages compared to Estonia (Aasland and Fløtten 2001). Mixed-ethnic marriages are still more common in Latvia. In 2009, about 21 % of Latvians had a spouse from a different ethnicity than Latvian (Central Statistical Bureau of Latvia 2010). In contrast, only 4 % of marriages were between Estonians and Russians in 2000 (Statistics Estonia 2010).

According the 1989 USSR Census, 15 % of Russians in Estonia and 22 % of Russians in Latvia were fluent in the titular language (Pavlenko 2008). However, since the late 1980s the language situation has changed. The official language is Estonian in Estonia and Latvian in Latvia, while Russian is defined as a foreign language. The knowledge of the official language is rising, especially among the younger generation. Between 1989 and 2000, the percentage of the population able to speak majority language rose from 62 to 82 % in Latvia and from 67 to 80 % in Estonia (Hogan-Brun 2007).

The ethnic segmentation was a characteristic of the work sphere during Soviet times and is also present in the contemporary Estonian and Latvian labour market. In general, the labour market position of Russian-speaking minority became more vulnerable after regaining the independence. In both countries, the unemployment rate is higher among non-natives than among ethnic Latvians or Estonians. In addition, returns on education in terms of high wages are significantly higher for natives compared to minority members (Leping and Toomet 2008; Lindemann and Saar 2009; Hazans 2010). One important reason for such a tendency is insufficient skills in the official language. However, the ethnic pay gap in Latvia is modest compared to Estonia and the gap between the majority and minority unemployment rates is smaller in Latvia (Hazans 2010).

In addition, about 16 % of the Latvian and 8 % of the Estonian population were without any citizenship in 2009 (Central Statistical Bureau of Latvia 2010; Statistics Estonia 2010). However, there are no legal restrictions for children without citizenship to participate in educational system.

3.2.2 Estonian and Latvian Educational Systems

In both Estonia and Latvia, primary and lower secondary schools constitute one uniform basic school. Basic education begins at the age of seven and lasts nine years. There are no tuition fees in public basic schools. According to the OECD (2010) Estonian and Latvian school systems are characterised by rather low levels of differentiation in selecting and grouping pupils. Thus, the learning environment in classrooms tends to be heterogeneous. However, some basic schools select pupils based on their ability in Estonia. In Latvia, it is generally not permitted to organise any admission tests for public schools, except for gymnasiums. After completion of basic education (lower secondary), pupils can choose to continue in a general secondary track or acquire some type of vocational education. This decision is typically made at the age of 15 or 16. In both countries, many pupils prefer to continue in the general secondary track as it offers the best opportunities for access to higher education (Trapenciere 2008; Saar and Lindemann 2008). In 2008/2009 about 64 % of pupils studying at upper secondary level were enrolled in general secondary schools in Latvia and about 66 % in Estonia (Central Statistical Bureau of Latvia 2010; Statistics Estonia 2010).

The division of schools on the basis of the language of instruction is a system that was inherited from the Soviet period, when Estonian and Latvian educational systems were part of the Soviet educational system. Studying in Russian was also an option at the level of higher education. Currently, the language of instruction at public higher education institutions is mainly the official language of the country, while it is also possible to study at Russian-language private universities.

3.2.3 Linguistically Divided Basic and Secondary Schools

During the last decades, there were substantial changes regarding Russian-medium basic and secondary schools in Estonia and Latvia. In general, basic schools are divided into (1) Estonian/Latvian-medium schools, (2) Russian-medium schools and (3) mixed schools (two-stream). Mixed or two-stream schools mean that some pupils study in classes with the majority language as the language of instruction and others in Russian as the language of instruction. In Estonia, Estonian-medium schools constituted 83 % of all schools in 2006, and 4 % of schools were mixed (Statistics Estonia 2010). At the same time in Latvia, 67 % of all pupils were enrolled in Latvian-medium schools, 24 % in Russian-medium schools and about 9 % of pupils attended mixed schools. A small share of pupils is enrolled at other ethnic minority schools (Kehris and Landes 2007).

The importance of the official language in Russian-medium schools has increased. In Latvia, all Russian-medium basic schools had introduced one of five possible models of bilingual education curricula by the year 2002. At the upper secondary level, all Russian-medium schools are supposed to have at least 60 % of

studies in Latvian since the school year of 2006/2007. The implementation of this reform became the subject of heated debate in Latvia, with a resultant growth in inter-ethnic tension (Hogan-Brun 2007). In Estonia, the transition to bilingual teaching in upper secondary school is still ongoing. Pupils who started 10th grade in 2011 have to study 60 % of their school subjects in Estonian. In recent years, the special programmes for language immersion have become ever more widespread in Russian-medium basic schools. Nevertheless, the influence of language immersion should be minor for PISA 2006 participants.

In both countries, the proportion of pupils enrolled at Russian-medium schools has decreased over the last 20 years. The general number of Russian-speaking pupils has dropped and several Russian-medium schools have closed (Hogan-Brun et al. 2007). Some Russian-speaking pupils prefer majority schools. In Latvia, for instance, about 16 % of pupils in Latvian-medium schools are ethnic minority children (Kehris and Landes 2007). Schools with Estonian or Latvian as the language of instruction are particularly valued among Russian-speaking parents who seek opportunities to help their children to become bilingual because the quality of teaching the national language in Russian-medium schools is considered insufficient (Hogan-Brun et al. 2007; Zepa et al. 2008). In Latvia, studies show that an important factor that influences school choice is the language proficiency of parents. The higher a parent's proficiency in Latvian, the greater is the possibility to choose a Latvian-medium school (Priedīte 2005).

Standardised state exams are conducted at the end of upper secondary education in both countries. The results of exams have been somewhat better for majority schools (Zepa 2010; NEQS 2010).

3.3 Theoretical Considerations

The situation of ethnic minorities in Estonia and Latvia differs in many respects from that of ethnic minorities in Western European countries and the U.S. However, theoretical approaches developed in these countries also contribute to the explanation of the educational performance of ethnic groups in the Baltic States.

Boudon (1974) uses the concept of primary and secondary effects to explain the influence of social background on educational performance and choices. While secondary effects indicate the influence of social background on educational choices, primary effects show the influence of social background on the academic performance of pupils. Primary effects could result from, for example, cultural, genetic or economic factors that differ between social classes (Van de Werfhorst and Van Tubergen 2007). It is widely accepted that performance differences are related to socialisation and parental involvement during childhood and as well to the opportunity to invest in good schools (Erikson and Jonsson 1996; Jonsson and Rudolphi 2011). In many countries, socio-economic background is an important reason for the overall weaker performance of immigrant pupils, but still

disadvantages remain for several ethnic groups after parental characteristics are controlled for (Levels and Dronkers 2008).

Heath and Brinbaum (2007) argue that a parental lack of fluency in the majority language may make it difficult for children to succeed in their schoolwork. This may lead to lower achievements in test scores than would be expected on the basis of the parents' socio-economic position. There is some evidence that language difficulties of students might contribute to second generation educational achievement (e.g. Schnepf 2007). However, the extent to which language difficulties affect the educational outcomes of the second generation is a rather unresolved issue (Heath et al. 2008).

Literature often points out that ethnic groups differ in terms of orientation toward schooling and achievement motivation (Kao and Thompson 2003). Immigrant parents' optimism about the prospects of their children is crucial (Kao and Tienda 1998). In addition, the migration experience might have an effect on aspirations. Parents who experienced downward mobility due to migration may expect the next generation to regain the lost social position through education (Platt 2005). On the other hand, Jonsson and Rudolphi (2011) argue that one plausible reason for some ethnic minorities' lower school performance in Sweden are low educational aspirations, which become visible in irregular school attendance and little focus on learning. In addition, attitudes toward schooling might be shaped by the ethnic community, and this effect might depend on how minorities are treated in the society and how they perceive their treatment. If minorities do not trust the educational system and feel that it threatens their minority identity, they may develop an oppositional culture to mainstream schooling as the most extreme response (Ogbu and Simons 1998).

Sørensen and Hallinan (1977) call attention to the organisational characteristics of schools that create differences in learning opportunities. As examples, these organisational characteristics include curriculum, instruction materials, teaching techniques, interaction style and pupil involvement. Ability and effort can be modified by those contextual factors (Sørensen and Hallinan 1977; Hallinan 2005). In addition, the social and ethnic composition of schools may influence the achievement of pupils. Pupils create the school's social environment from the advantages and disadvantages they bring from home to school. Several studies show that school composition—in terms of the average socio-economic status of the parents and the segmentation into ethnic groups—has an effect on educational achievement, in spite of pupils' individual characteristics (Bankston and Caldas 1996; Portes and Hao 2004).

These theoretical considerations are also helpful for explaining the situation of ethnic minorities in Estonia and Latvia. One explanation for the lower school performance of ethnic minorities is their language skills. Pupils who speak a minority language in home can have difficulties to understand the linguistic contexts of school tasks (Esser 2006). Unfortunately, the PISA 2006 survey does not directly measure language proficiency. Thus, it is not possible to draw definitive conclusions about the importance of language skills. However, these skills may lower the educational performance if the language of instruction at school differs

from the language spoken at home. *Therefore, it is supposed that Russian-speaking pupils who attend Estonian-medium or Latvian-medium schools are likely to achieve lower test scores in mathematics in both countries. In contrast, Russian-speaking pupils who are enrolled in schools where Russian is the language of instruction should not experience any difficulties due to their language skills.*

Several individual characteristics may contribute to the differences in the educational achievement of ethnic minorities and the majority. Due to the specificity of immigration history during Soviet period, it is likely that native and Russian-speaking pupils do not differ significantly in terms of parental education level or cultural resources. Thus, minority pupils should not get less support in their schoolwork from parents. However, since the beginning of the 1990s, the Russian-speaking minority has been in a more disadvantaged position in the labour market. Thus, Russian-speaking families may have lesser financial resources to support their children in their educational career. Although the vast majority of 15 year-old pupils are studying at public school in Estonia and Latvia, Russian-speaking families may have fewer resources for covering other learning-related costs (e.g. books). *Therefore, social background may have some negative effects on the achievement of Russian-speaking pupils, but it is unlikely that social background is the reason for the achievement gap between majority and minority pupils.*

There is not much research about ethnic differences in educational aspirations and learning motivation in Estonia and Latvia. The Russian-speaking population of Estonia indicates a bit more often than Estonian-speakers that they want their children to go on to higher education (Saar 2008). Russian-speakers with higher education who have experienced downward mobility due to a lack in language skills may especially encourage their children to achieve academically if the distribution of opportunity in the educational system is perceived as equal. *However, occupational aspirations and the motivation to learn are not expected to be the reasons for the achievement gap between majority and Russian-speaking pupils.*

Characteristics of schools might also contribute to differences in the achievement of ethnic groups. In general, it seems that the opportunity to learn does not differ significantly in schools with the majority language and Russian as the language of instruction. In both countries, there is a unified national curriculum (Golubeva 2010). However, in Estonia, the transition to the new curriculum in mathematics in the second half of the 1990s was difficult for Russian-medium schools. In the years 1963 to 1991, the practice of teaching mathematics differed between schools with Estonian and Russian as their language of instruction, as the latter relied on Soviet textbooks and methods (there was no such difference in Latvia). Therefore, Russian teachers had difficulties in getting used to the new ways of teaching and textbooks (Monakov and Ševtšenko 2003). In both countries, the replacement of textbooks was slower in Russian-medium schools than in other schools due to time-consuming translation. *Thus, it is expected that there may be some achievement differences between schools that have Russian and schools that have the majority language as their language of instruction, especially in Estonia.*

The selection of pupils into schools influences the learning environment and also the resources available at school. According to PISA 2006 data, Russian-medium schools are not significantly less selective than majority schools regarding the importance of pupils' academic performance (analysis not presented here). *Thus, it is supposed that the selectivity of the school influences the achievement of pupils, but that it is not the reason for achievement differences between schools that have Russian and schools that have the majority language as their language of instruction.*

The ethnic-linguistic composition of schools is not very heterogeneous in Estonia and Latvia. In Russian-medium schools most pupils are ethnic Russians or Russian-speakers from other ethnic groups. There is somewhat more heterogeneity in majority schools. The socio-economic composition of schools might be a bit lower in Russian-medium schools, especially in Estonia, where the labour market position between minority and majority groups differs more compared to Latvia (Hazans 2010). In addition, Russian-speaking parents with more resources seem to prefer schools with the majority language as the language of instruction in Estonia.[1] *Therefore, it is supposed that the socio-economic composition of schools explains the differences in achievement between pupils in Russian-medium and pupils in majority schools, especially in Estonia.*

3.4 Data and Variables

The OECD Programme for International Student Assessment (PISA) focuses on pupils' competencies in reading, mathematics and science. PISA examines pupils' ability to use their knowledge and skills to meet real-life challenges. The third PISA survey (2006) includes 30 OECD countries and 27 partner countries, including Estonia and Latvia. The average age of the participating pupils was 15. PISA samples students randomly in two stages: schools are first sampled from the country-level and then pupils are sampled in the participating schools (OECD 2009). The PISA survey also includes a school questionnaire.

The sample size in Estonia was 4865 pupils (127 Estonian-medium, 38 Russian-medium and 4 mixed schools). The Latvian sample included 4719 pupils (114 Latvian-medium, 46 Russian-medium and 16 mixed schools). The majority of sampled pupils were studying at basic school.

Almost all Russian-speaking pupils in the sample were born in the host country. About 40 % of Russian-speaking pupils in Estonia and 20 % in Latvia are second-generation immigrants. Due to this specific context, integration into the host society was not necessary prior to 1991, and the differences between young second

[1] PISA 2006 data show that in Estonia, parental occupational position is higher for Russian-speakers in Estonian-medium schools than in Russian-medium schools, whereas no such difference is found in Latvia (analysis not presented here).

and third-generation Russian-speakers should be rather irrelevant in these countries.

The dependent variable is mathematical performance. Since assessing each student with the whole item battery in the PISA test would be time-consuming, only certain subsamples of pupils responded to each item. In order to compare the ability of pupils, the cognitive data in the PISA study are scaled on the basis of Item Response Theory. Such modeling estimates the ability of each pupil by using the number of correct answers and the difficulty of the items. The PISA data-set contains five plausible values that represent the ability in mathematics for each pupil. These scores are standardised to an international mean of 500 and a standard deviation of 100 (OECD 2009).

Independent variables include pupil and school-level variables. At the pupil level, *gender* and *grade* are included as control variables. The following variables describing family background are used in analysis:

- *Language spoken at home* specifies whether the pupil speaks the majority language (Estonian or Latvian), Russian or another language at home.[2]
- *Highest parental educational level* is measured according to the ISCED scale which is divided into 4 levels: (1) ISCED 2 or lower, (2) ISCED 3 and 4, (3) ISCED 5b, and (4) ISCED 5a and 6.[3]
- *Highest parental occupational status* is measured according to the ISEI scale (the International Socio-Economic Index of Occupational Status)
- *Number of books at home*, which refers to cultural resources available at home.

Pupils' *occupational aspirations* are measured by an open-ended question which recorded their expected occupational status at age 30. For analysis, occupational aspirations are divided into five groups: (1) managers or professionals, (2) lower white-collar, (3) skilled worker, (4) unskilled worker and (5) missing. The relationship between occupational aspirations and educational performance may be bi-directional. *Motivation* was measured by the question: "In general, how important do you think it is for you to do well in mathematics?" Four categories are separated: (1) very important, (2) important, (3) of little importance or none at all, and (4) missing.

At the school level, the following variables describing school context were included:

- *Language of instruction* is defined on the basis of the test language. Schools are divided into Estonian-medium/Latvian-medium, Russian-medium and mixed schools.
- *School location* specifies whether the school is located in a village (up to 3,000 inhabitants), in a town or in the city (more than 100,000 inhabitants).

[2] Pupils were asked what language they speak at home most of the time, with the option to select only one language. Thus, it is impossible to identify bilingual families.

[3] PISA coding of parental education does not allow separation into the vocational and the general track of secondary education in Estonia and Latvia.

- *Selectivity of pupils*: (1) high—a pupil's good academic record (including placement tests) is a prerequisite or high priority for admission, (2) low—academic records or placement tests are not a high priority. This question is about general practice and evaluated by the schools' headmasters/headmistresses.
- *Socio-economic composition of school* is specified as the average highest occupational status (ISEI) of the parents of the school's pupils.

3.5 Method

At first, there is an overview given of the average mathematical performance in schools with different language of instruction. Means, standard errors and standard deviations are computed using then mean of five plausible values (OECD 2009). For multilevel analysis, all missing data was deleted. The variable describing the highest parental occupational status had the most missing values (1.7 % in Estonia and 4.5 % in Latvia). The final sample size for Estonia is 4709 pupils and 169 schools and for Latvia 4385 pupils and 172 schools. All continuous variables were centred on the grand mean. The multilevel analysis was carried out using the HLM program.

As a first step of multilevel analysis, we analyse a model without explanatory variables. This intercept-only model is useful because it gives an estimate of intra-class correlation, which is defined as the population variance between level 2 units divided by the total variance (Hox 2002). In the next step, pupil-level variables describing social background, the language spoken at home, motivation and occupational aspirations are added to the model (Model 1). This model is compared with the intercept-only model and the amount of variance explained by introducing explanatory variables is calculated. Then the language of instruction is included (Model 2). Next, location and selectivity are controlled for (Model 3). In the last model we also add the socio-economic composition of the school (Model 4). In these four models the regression intercept is assumed to vary across the groups, but regression slopes are fixed. Nevertheless, models with school-level characteristics were also estimated with varying slopes, which basically yielded the same results. Therefore, we prefer the simpler model. The improvement of the models is tested with the likelihood-ratio test, which is based on the difference between deviance statistics of two models (Raudenbush and Bryk 2002). In addition, an interaction term of the language of instruction at school and the language spoken at home is tested. Separate models are estimated for Estonian-medium and Latvian-medium schools.

3.6 Results

3.6.1 Descriptive Overview

In Estonia, the overall mean score for mathematics is 515 points, which is a result above OECD average (OECD 2007a). Despite this good overall result there are large differences between pupils who speak Estonian at home and those who speak Russian at home (Table 3.1). Pupils who speak another language at home (only a few cases) also achieve lower scores compared to Estonian-speakers. There are significant achievement differences between pupils studying at schools with Estonian as the language of instruction and those studying at schools with Russian as the language of instruction, resulting in respectively 523 and 486 points. In Estonia, only 2 % of the pupils in our sample are studying at mixed schools. The achievement in these mixed schools is lower compared to Estonian-medium schools.

A number of Russian-speaking children also study at schools with Estonian as the language of instruction. This seems to pay off in terms of performance, even

Table 3.1 Average mathematical performance in Estonia

	Mean	Standard error of mean	Standard deviation
Overall mean	515	2.7	80
Language spoken at home:			
Estonian	524	3.1	78
Russian	491[a]	5.4	80
Other	451[a]	20.5	90
Language of instruction at school:			
Estonian	523	3.0	79
Russian	486[a]	6.2	80
Mixed	491[a]	6.8	68
Different groups according the language in school and home:			
Estonian-speakers at Estonian schools	524	3.1	79
Russian-speakers at Estonian schools	513[b]	6.1	77
Russian-speakers at Russian schools	488[a]	6.3	80
Immigrant generation:			
Russian-speakers, at least 3rd generation and natives	491	5.7	
Russian-speakers, 2nd generation	497	5.8	
Russian-speakers, 1st generation	475	17.1	

[a] Average test score of the group differs significantly compared to Estonian-speakers and/or pupils studying at Estonian schools

[b] Russian-speakers perform significantly better at Estonian schools than at Russian schools

Source Own calculations based on PISA 2006, replicate weights have been taken into account (OECD 2009)

though Russian-speakers in Estonian-medium schools achieve scores that are, on average, a bit lower than the scores of Estonian-speakers (Table 3.1). Table 3.1 also indicates that the academic performance of Russian-speakers does not differ depending on which generation of immigrants they are.

The average mathematical performance in Latvia is 486 points, which is below OECD average (OECD 2007a). Table 3.2 indicates that the average performance of pupils who speak Russian at home does not differ from pupils who speak Latvian at home. In addition, pupils at schools with Latvian and Russian as the language of instruction have almost the same average score. Pupils who attend mixed schools have significantly lower average scores in mathematics, but mixed schools are more common in rural areas.

There are significant performance differences between pupils within Latvian-medium schools (Table 3.2). Russian-speakers achieve lower scores at these schools than Latvian-speakers. Russian-speakers attending mixed schools have the lowest performance, while Latvian-speakers at the same schools perform somewhat better. Table 3.2 also shows that in Latvia, similar to Estonia, immigration generation does not differentiate the achievements of pupils.

Table 3.2 Average mathematical performance in Latvia

	Mean	Standard error of mean	Standard deviation
Overall mean	486	3.0	83
Language spoken at home:			
Latvian	489	3.3	80
Russian	485	6.1	85
Other	477	23.0	96
Language of instruction at school:			
Latvian	488	3.3	81
Russian	492[a]	7.4	85
Mixed	452[b]	10.9	83
Different groups according the language at school and home:			
Latvian-speakers at Latvian schools	491	3.4	80
Russian-speakers at Latvian schools	471[b]	6.8	84
Russian-speakers at Russian schools	494	7.5	84
Latvian-speakers at mixed schools	463	12.6	80
Russian-speakers at mixed schools	442[bc]	10.7	81
Immigrant generation:			
Russian-speakers, at least 3rd immigrant generation and natives	485	6.8	
Russian-speakers, 2nd generation	492	5.6	
Russian-speakers, 1st generation	486	17.2	

[a] Pupils who study at Russian schools perform significantly better than pupils at mixed schools
[b] Average test score of the group differs significantly compared to Latvian-speakers and/or pupils studying at Latvian schools
[c] Russian-speakers perform significantly better at Russian schools than at mixed schools
Source Own calculations based on PISA 2006, replicate weights have been taken into account (OECD 2009)

3.6.2 Multilevel Models

In a first step of multilevel modelling, the intercept-only models were estimated. The intra-class correlation indicates that about 25.7 % of variance in mathematical performance is at the school level in Estonia and 22.2 % in Latvia. Therefore pupils from different schools achieve somewhat different scores. However, the variance between schools in Estonia and Latvia is much lower compared with Hungary, the Czech Republic and Slovakia (OECD 2007b), where selection into different educational tracks takes place at an earlier age than 15 (e.g. Kogan 2008). In contrast, compared to Sweden, Finland and Denmark, the between-school variance is a bit higher in Estonia and Latvia (OECD 2007b).

The Case of Estonia

Table 3.3 presents further multilevel models for Estonia. The difference in deviance statistics between the intercept-only model and Model 1 indicates that adding pupil-level variables improves model fit significantly. It appears that almost 29 % of variance is explained at the pupil level by social background and measures of motivation and aspirations. Not surprisingly, these variables also explain almost 53 % of variance at the school level. For example, the language spoken at home varies significantly across schools. In other words, this shows that individual-level, explanatory variables are divided rather selectively across the groups, i.e. the composition of groups is rather unequal (Hox 2002). Similarly with descriptive analysis, Model 1 shows that Russian-speaking pupils achieve lower test scores compared to Estonian-speakers, even if they share a similar social background. In addition, motivation and occupational aspirations do not explain the disadvantage of Russian-speakers.

School-level variables are added in further steps of the analysis (each step improved model fit). First, the language of instruction at school is included in Model 2. It appears that pupils at Russian-medium schools and mixed schools achieve significantly lower test scores compared to pupils at Estonian-medium schools. Therefore, the language of instruction at school has an effect on achievement, despite similar social background, motivation or occupational aspirations.

The selectivity of the school and school location are added into Model 3. The negative effect of studying at a Russian-medium school does not decrease. Thus, the way schools select their pupils is not the reason for the lower achievement of pupils at these schools. However, the measure of selectivity captures only school practices without taking into account that the school can only choose from among the pupils who apply. Although the OECD (2010) claims that classrooms in Estonia are heterogeneous, the difference between more and less selective schools is apparent in analysis, even in cases of similar parental background. Thus, the

Table 3.3 The influence of pupil and school-level variables on mathematical performance in Estonia, coefficients and standard errors of multilevel models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Intercept	555	4.4	558	4.4	555	7.7	550	7.9
Pupil-level variables								
Language spoken at home (ref. Estonian)								
Russian	−21.9***	4.8	−11.1**	5.1	−13.0**	5.3	−13.2**	5.2
Other	−78.5**	18.0	−66.7***	17.7	−67.9***	18.0	−67.5***	18.1
Highest parental education level (ref. ISCED 5a or 6)								
ISCED 2 or lower	−6.4	8.7	−7.0	8.7	−6.3	8.7	−5.0	8.7
ISCED 3 or 4	2.6	2.4	2.3	2.4	2.3	2.4	2.3	2.4
ISCED 5b	−7.2**	2.9	−7.4**	3.0	−7.6**	3.0	−7.7**	3.0
Highest parental occupational status	0.73***	0.1	0.72***	0.1	0.71***	0.1	0.68***	0.1
Number of books at home (levels)	10.6***	1.1	10.7***	1.1	10.6***	1.1	10.5***	1.1
Motivation (ref. very important)								
Important	−12.5***	1.9	−12.2***	2.0	−12.3***	1.9	−12.3***	2.0
Little importance or none at all	−25.7***	3.9	−25.5***	3.9	−25.8***	3.9	−26.0***	3.9
Missing	−22.9**	10.6	−22.3**	10.5	−22.4**	10.6	−22.3**	10.6
Expected occupational status at age 30 (ref. manager or professional)								
Lower white-collar	−24.2***	3.3	−24.2***	3.3	−24.1***	3.3	−24.2***	3.3
Skilled worker	−36.2***	4.2	−36.1***	4.1	−35.9***	4.1	−35.7***	4.2
Unskilled worker	−21.0***	3.6	−21.1***	3.6	−21.0***	3.6	−21.2***	3.6
Missing	−28.0***	3.6	−27.9***	3.5	−27.9***	3.5	−27.9***	3.6
School-level variables								
Language of instruction at school (ref. Estonian)								
Russian			−26.8***	9.6	−29.9***	9.4	−16.8*	9.4
Mixed			−26.2***	8.0	−22.5***	8.5	−13.9	8.8
School location (ref. city)								

(continued)

Table 3.3 (continued)

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Town					−0.3	7.2	3.2	6.6
Village					−6.8	8.2	8.2	10.0
Selectivity (ref. low)								
High					15.9***	5.7	10.3**	4.8
School composition (average parental occupational status)							1.50**	0.7
Deviance	51982		51968		51953		51939	
Variance explained at								
Pupil level	28.8 %		28.8 %		28.8 %		28.8 %	
School level	52.7 %		55.7 %		61.3 %		66.7 %	

Note controlling for gender and grade, *p < 0.10, **p < 0.05, ***p < 0.01
Source Own calculations based on PISA 2006

advantage of more selective schools could be related to learning environments and teaching practices.

Finally, the school composition in terms of the average highest occupational status of parents is added in Model 4. School composition has a strong influence on mathematical performance and significantly reduces the negative effect of studying at a Russian-medium school. Therefore, the low achievement of pupils at these schools can be at least partly explained by the socio-economic composition of schools, which influences the achievement of pupils despite their individual social backgrounds.

The Case of Latvia

Table 3.4 presents multilevel models with pupil and school-level variables for Latvia. Model 1 includes all pupil-level characteristics, which explain about 26 % of variance at pupil level and about 38 % of variance at school level. Therefore in Latvia, similarly to Estonia, schools differ significantly regarding pupils' social background, the language spoken at home, motivations and aspirations. However, contrary to descriptive analysis, multilevel analysis indicates that pupils who speak Latvian at home achieve somewhat better test scores in mathematics compared to pupils whose language at home is Russian (Model 1).

Further models also include school-level variables (each of the following models has a significantly better fit compared to earlier models). The language of instruction at school is added to Model 2. It appears that pupils at Russian-medium schools perform similarly to pupils at Latvian-medium schools. Descriptive statistics already indicated that academic achievement at Latvian-medium and Russian-medium schools is similar, and taking into account social background, aspirations and motivations does not change this outcome. In contrast, pupils attending mixed schools achieve somewhat lower test scores compared to those who attend Latvian-medium schools.

These effects do not change after school location and selectivity are included into Model 3. School location accounts significantly for pupils' performance differences. Pupils studying in villages or towns perform lower than pupils studying in larger cities.[4] Selection does not have any effect. In general, the selection of pupils is less common practice in Latvia than in Estonia.

The measure of school composition in terms of the average highest occupational status of the parents is added in Model 4. It does not have significant influence on mathematical performance, but it reduces the negative effect of studying at mixed schools. Thus, the lower test scores of mixed schools are partly explained by the lower socio-economic composition of these schools.

[4] Latvian PISA data indicates that the average test score of pupils in Riga and other urban areas is much higher compared to the test scores of pupils from rural areas. However, these regional disparities are largely conditioned by family background (Geske et al. 2006).

Table 3.4 The influence of pupil and school-level variables on mathematical performance in Latvia, coefficients and standard errors of multilevel models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Intercept	528	4.7	528	4.7	542	7.7	539	7.9
Pupil-level variables								
Language spoken at home (ref. Latvian)								
Russian	−9.2**	4.4	−10.8**	5.1	−11.3**	5.1	−11.3**	5.1
Other	−2.6	19.2	−2.4	19.1	−2.3	19.1	−2.4	19.1
Highest parental education level (ref. ISCED 5a or 6)								
ISCED 2 or lower	−35.3***	13.4	−35.2***	13.4	−34.7***	13.4	−34.3**	13.3
ISCED 3 or 4	−5.2*	3.0	−5.2*	3.0	−4.9	3.0	−4.8	3.1
ISCED 5b	−6.7**	2.9	−6.7**	2.9	−6.6**	2.9	−6.6**	2.9
Highest parental occupational status	0.44***	0.1	0.44***	0.1	0.42***	0.1	0.41***	0.1
Number of books at home (levels)	11.8***	1.2	11.8***	1.2	11.7***	1.2	11.7***	1.2
Motivation (ref. very important)								
Important	−9.1***	2.7	−9.1***	2.7	−9.2***	2.7	−9.2***	2.7
Little importance or none at all	−25.2***	4.8	−25.3***	4.8	−25.3***	4.8	−25.5***	4.8
Missing	−35.4***	10.3	−35.4***	10.3	−35.5***	10.2	−35.6***	10.2
Expected occupational status at age 30 (ref. manager or professional)								
Lower white-collar	−27.8***	3.2	−27.8***	3.2	−27.6***	3.2	−27.5***	3.3
Skilled worker	−35.0***	5.7	−35.0***	5.7	−34.3***	5.6	−34.1***	5.6
Unskilled worker	−21.4***	3.9	−21.4***	3.9	−21.4***	3.9	−21.3***	4.0
Missing	−34.0***	3.8	−34.0***	3.8	−33.8***	3.8	−33.6***	3.8
School-level variables								
Language of instruction at school (ref. Latvian)								
Russian			6.7	9.4	−2.8	10.2	−0.22	10.0
Mixed			−16.2**	8.1	−17.2*	9.5	−13.1	8.6
School location (ref. city)								

(continued)

Table 3.4 (continued)

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Town					−13.6*	7.4	−12.2	8.4
Village					−20.5**	8.7	−13.5	10.6
Selectivity (ref. low)								
High					6.7	6.9	4.8	8.4
School composition (average parental occupational status)							0.73	0.9
Deviance	49010		49005		48994		48991	
Variance explained at								
Pupil level	26.4 %		26.4 %		26.4 %		26.4 %	
School level	38.3 %		40.5 %		44.9 %		46.1 %	

Note Controlling for gender and grade, *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$
Source Own calculations based on PISA 2006

Table 3.5 Mathematical performance at majority-language schools in Estonia and Latvia, coefficients and standard errors of multilevel models

	Estonian-medium schools in Estonia		Latvian-medium schools in Latvia	
	Coef.	S.E.	Coef.	S.E.
Intercept	555	8.3	540	8.9
Pupil-level variables				
Language spoken at home (ref. Estonian/Latvian)				
Russian	−14.1***	5.6	−6.2	6.8
Other	−1.8	16.9	−9.3	26.2
Highest parental education level (ref. ISCED 5a or 6)				
ISCED 2 or lower	−5.7	9.1	−40.1**	16.7
ISCED 3 or 4	2.5	2.8	−6.5*	3.8
ISCED 5b	−7.5**	3.5	−10.6**	4.4
Highest parental occupational status	0.68***	0.1	0.38***	0.1
Number of books at home (levels)	10.6***	1.2	11.7***	1.4
Motivation (ref. very important)				
Important	−12.5***	2.3	−7.2**	3.2
Little importance or none				
At all	−25.2***	4.4	−20.4***	6.3
Missing	−11.4	16.2	−39.2***	12.5
Expected occupational status at age 30 (ref. manager or professional)				
Lower white-collar	−25.6***	3.7	−30.4***	4.2
Skilled worker	−32.1***	4.8	−34.8***	5.9
Unskilled worker	−24.6***	3.7	−21.2***	5.0
Missing	−36.6***	3.8	−34.9***	4.7
School-level variables				
School location (ref. city)				
Town	0.6	7.2	−11.3	10.9
Village	−1.4	10.6	−15.9	13.9
Selectivity (ref. low)				
High	10.4	5.2	4.1	10.4
School composition (average parental occupational status)	1.0	0.7	0.14	1.1

Note Controlling for gender and grade, *p < 0.10, **p < 0.05, ***p < 0.01
Source Own calculations based on PISA 2006

3.6.3 Russian-Speakers at Majority Language Schools

In both countries, pupils who speak Russian at home achieve lower test scores than native speakers of the national language—despite similar individual-level characteristics and school contexts (Tables 3.3 and 3.4). The interaction between the language spoken at home and the language of instruction at school was added to Model 4 for the purpose of testing how Russian-speakers manage at majority-language

schools. The results were significant for Estonia, but not for Latvia (models not presented here). In Latvia it also seems that Russian-speakers at mixed schools perform worse than Latvian-speakers, but the number of mixed schools in the sample is too small to calculate reliable estimates.

Table 3.5 presents separate models for Estonian-medium and Latvian-medium schools. It appears that Russian-speakers achieve significantly lower test scores at Estonian-medium schools compared to Estonian-speakers, even in case of similar parental background, motivations, aspirations and school characteristics. The gap between groups is about 14 points. The reason for this difference could be language difficulties, but unfortunately the PISA 2006 study does not include a measure for language skills. In Latvia, there is no significant difference between the performance of Russian-speakers and Latvian-speakers. Compared to Estonia, Russian-speaking pupils in Latvia are more likely to have one parent who is a speaker of the majority language due to a higher (ethnic) intermarriage rate.

3.7 Conclusion

This chapter compared two post-socialist countries—Estonia and Latvia. In general, societal developments and the educational systems in Estonia and Latvia have many similar characteristics. There are large Russian-speaking minority groups in both countries. Many of them are post-war immigrants or their descendants. During Soviet times, these ethnic communities were separated by clear lines in these societies, demarcating labour market segmentation and the division of the educational system on the basis of language. After Estonia and Latvia regained their independence, uncertainty increased—especially for the Russian-speaking community, due to difficulties related to citizenship status and lack of proficiency in the official language. The need for a stronger integration of society was one incentive for the school reforms in Estonia and Latvia, which aimed to render Russian-medium schools more bilingual.

Ethnic differences in the educational performance and academic outcomes are apparent in various societies. It is often emphasized that educational achievement is connected to language skills. Esser (2006) points out that immigrant children usually have to cope with tasks that are embedded in a linguistic context or related to a cultural context that is closely associated with the local language and local cultural knowledge. In contrast, the influence of language skills should be relatively minor in linguistically divided educational systems, where ethnic minority pupils have an opportunity to study at least partly in their native language. The results of this chapter show that the linguistically divided educational systems in Estonia and Latvia produce rather different outcomes. In Latvia, pupils at Russian-medium and Latvian-medium schools achieve similar test scores in mathematics. In contrast, pupils at Russian-medium schools in Estonia achieve lower results in mathematics than pupils at majority-language schools.

In Estonia and Latvia, immigrants were not negatively selected in terms of education. Analysis indicates that, contrary to findings in several Western European countries, individual parental background is not the reason for the minority group's disadvantage in Estonia. In addition, their motivations and aspirations do not cause Russian-speakers' lower achievement in Estonia, although these characteristics have significant influence on the educational performance. In Latvia, similarly, parental background, motivations and aspirations seem not to be the factors that would especially promote Russian-speakers performance, but rather are important for all pupils. In line with this argument, according to cross-tabulations (not shown here) there is no difference in motivation between ethnic groups.

The question remains of how to explain the achievement gap between pupils studying at schools with a different language of instruction in Estonia, while there is no such trend in Latvia. Moreover, cross-sectional PISA data include the measurement of performance only at one time point, which complicates conclusions regarding whether and how learning at Russian-medium schools directly causes lower educational performance. However, Russian-speaking pupils who were enrolled at Russian-medium schools in 2006 should not have experienced difficulties due to a lack of language skills. In addition, results show that the gap between Estonian-medium and Russian-medium schools is not directly conditioned by how schools select pupils on the basis of academic ability. Pupils in more selective schools still achieve better results, especially in Estonia. Unfortunately, this measure captures the selection process only partially, since parents and pupils also select schools.

Findings indicate that the lower performance of pupils in Russian-medium schools is to some extent explained by the socio-economic composition of these schools in Estonia. This has an effect on achievement irrespective of individual social background. It has been argued that the socio-economic composition of schools aggregates the influence of school peers on pupils' school experience and their academic gains (Portes and Hao 2004). Therefore, it seems that the downward mobility of the Russian-speaking community in Estonia has had some influence also on the social environment of Russian-medium schools. We thus predict a *secondary effect*, in terms of an unintended consequence, of dividing the educational system on the basis of language. In Latvia, in contrast, the socio-economic composition of schools and their selection practices do not have direct influence on pupils' educational achievement, even if the school is similar in type and location.

Besides the composition of schools, differences in academic performance may be conditioned by organisational characteristics that influence learning opportunities in schools. The curricula differences in mathematics are expected to be minor between Russian-medium and majority language schools in both countries. For Estonia, however, Monakov and Ševtšenko (2003) mention difficulties in Russian-medium schools that are related to the transition to a new curriculum in mathematics. An additional explanation could be the teaching methods or focus. The international OECD's TALIS study in Estonia shows that teachers at schools with Russian as the language of instruction believe more strongly in providing

correct solutions to pupils and they put more emphasis on the necessity of studying facts than teachers in Estonian-medium schools (Loogma et al. 2009). In addition, the international TIMSS study of 2003 shows that the gap in the academic performance between 8th graders in Russian-medium and Estonian-medium schools is wider in reasoning and analytical skills, whereas there are no significant differences in terms of factual knowledge and conceptual understanding (Mere et al. 2006). Unfortunately, no such comparative evidence is available for Latvia.

An additional question is how educational reforms have influenced the trust in schools in both countries. In Latvia, the transition to bilingual teaching in Russian-medium basic schools already started in 2002, while it is still ongoing in Estonia. It has been argued that the way a minority community perceives its members' treatment by society influences their trust in the educational system and their certainty about maintaining their minority group identity (Ogbu and Simons 1998). Community forces may also influence the certainty of Russian-speaking pupils in Estonia and Latvia. For example, the Russian community has pointed out that the transition to bilingual teaching in Russian-medium schools may be a threat to their identity (Hogan-Brun 2007). However, recent educational reforms mean that schools in Estonia and Latvia are changing and it is crucial to see whether ethnic differences in educational performance persist over longer periods of time.

The number of Russian-speaking pupils in Estonian-medium and Latvian-medium schools is growing (Hogan-Brun et al. 2007; Kehris and Landes 2007). Results indicate that Russian-speakers who study in the majority language in Estonia perform significantly lower than native pupils, while no such clear disadvantage is visible in Latvia. One reason may be the lack of pupils' or even parents' language skills, which means that parents are able to offer only limited help with schoolwork. However, in Latvia, minority parents who opt for Latvian-medium schools often have some proficiency in Latvian (Priedīte 2005). Unfortunately, not much is known about the language skills of Russian-speaking parents in Estonia.

The comparison of Estonia and Latvia reveals that pupils' opportunity to study in their native language does not reduce ethnic differences in the educational performance in these countries. The Latvian case shows that minority pupils manage well both at Latvian-medium and Russian-medium schools. In Estonia, however, Russian-speaking pupils who study at Russian-medium or Estonian-medium schools achieve lower test scores than their Estonian-speaking peers. The integration context of the country might be an important factor that influences academic performance. Compared to Estonia, the distance between the majority and the Russian-speaking minority is smaller in Latvia in terms of socio-economic position, social interaction, geographical distribution and interethnic marriages (Aasland and Fløtten 2001; Hazans 2010; Rozenvalds 2010). This could account for the similar academic performance of pupils at Latvian-medium and Russian-medium schools, whereas clear differences emerge in Estonia.

Two important limitations of this study were the lack of a measurement to ascertain language skills and the absence of the possibility to identify bilingual families. Such data would help to explain the situation of Russian-speaking pupils

at schools where the majority language is the language of instruction. In addition, more research is needed to find out whether the language of instruction determines the educational choices of different ethnic groups in Estonia and Latvia, which would make it possible to estimate more precisely the outcomes of these linguistically divided educational systems.

References

Aasland, A., and T. Fløtten. 2001. Ethnicity and social exclusion in Estonia and Latvia. *Europe-Asia Studies* 53(7): 1023–1049.

Bankston, C., and S. Caldas. 1996. Majority African American Schools and social injustice: The influence of De Facto Segregation on academic achievement. *Social Forces* 75(2): 535–555.

Boudon, R. 1974. *Education, opportunity, and social inequality. Changing prospects in Western society*. New York: Wiley.

Central Statistical Bureau of Latvia. 2010. Statistics Database. (http://www.csb.gov.lv/en).

Erikson, R., and J.O. Jonsson. 1996. Introduction. Explaining class inequality in education: The Swedish test case. In *Can education be equalized? The Swedish case in comparative perspective*, ed. R. Erikson, et al., 1–63. Boulder: Westview Press.

Esser, H. 2006. Migration, Language and Integration. AKI Research Review 4.

Greene, J.P. 1998. *A meta-analysis of the effectiveness of bilingual education*. Claremont: Tomas Rivera Policy Institute.

Geske, A., A. Grīnfelds, I. Dedze, and Y. Zhang. 2006. Family background, school quality and rural-urban disparities in students learning achievement in Latvia. *Prospects* 4(4): 419–431.

Golubeva, M. 2010. Different history, different citizenship? Competing narratives and diverging civil enculturation in majority and minority schools in Estonia and Latvia. *Journal of Baltic Studies* 41(3): 315–329.

Hallik, K. 2002. Nationalising policies and integration challenges. In *The challenge of Russian minority*, ed. M. Lauristin, et al., 65–88. Tartu: Tartu University Press.

Hallinan, M.T. 2005. Sørensen's learning opportunities model: theoretical foundations, mathematical formalization, and empirical analysis. In *Inequality: structures, dynamics, and mechanisms, essays in honour of Aage B. Sorensen*, ed. A.L. Kalleberg, et al., 67–89. Amsterdam: Elsevier Ltd.

Hazans, M. 2010. Ethnic minorities in the Latvian labour market, 1997–2009: outcomes, integration drivers and barriers. In *How integrated is Latvian society? An audit of achievement, failures and challenges*, ed. N. Muižnieks, 125–159. Riga: University of Latvia Press.

Heath, A., and Y. Brinbaum. 2007. Guest editorial: Explaining ethnic inequalities in educational attainment. *Ethnicities* 7(3): 291–305.

Heath, A., C. Rothon, and E. Kilpi. 2008. The second generation in Western Europe: Education, unemployment, and occupational attainment. *Annual Review of Sociology* 34: 211–235.

Hogan-Brun, G. 2007. Language-in-education across the Baltic: Policies, practices and challenges. *Comparative Education* 43(4): 553–570.

Hogan-Brun, G., M.R. Uldis-Ozolins, and M. Rannut. 2007. Language politics and practices in the Baltic States. *Current Issues in Language Planning* 8(4): 469–631.

Hox, J. 2002. *Multilevel analyses: techniques and applications*. Mahwah: Lawrence Erlbaum Associates.

Jonsson, J.O., and F. Rudolphi. 2011. Weak performance—strong determination: school achievement and educational choice among children of immigrants in Sweden. *European Sociological Review* 27(4): 487–508.

Kao, G., and J.S. Thompson. 2003. Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology* 29: 417–442.

Kao, G., and M. Tienda. 1998. Educational aspirations of minority youth. *American Journal of Education* 106(3): 349–384.

Kehris, I.B. and X. Landes. 2007. Multicultural Education in Latvia. Emilie – Reports on Education and Cultural Diversity in Europe. http://emilie.eliamep.gr/wp-content/uploads/2009/11/education-report-final-last.pdf.

Kogan, I. 2008. Education systems of central and Eastern European countries. In *Europe enlarged: A handbook of education, labour and welfare regimes in Central and Eastern Europe*, ed. I. Kogan, et al., 7–30. Bristol: Policy Press.

Leping, K.-O., and O. Toomet. 2008. Emerging ethnic wage gap: Estonia during political and economic transition. *Journal of Comparative Economics* 36(4): 599–619.

Levels, M., and J. Dronkers. 2008. Educational performance of native and immigrant children from various countries of origin. *Ethnic and Racial Studies* 31(8): 1404–1425.

Lindemann, K., and E. Saar. 2009. Non-estonians in the labour market. In *Estonian human development report 2008*, ed. M. Lauristin, 95–100. Tallinn: EestiKoostööKogu.

Loogma, K., V.-R. Ruus, L. Talts, and K. Poom-Valickis. 2009. *Õpetaja professionaalsus ning tõhusama õpetamis- ja õppimiskeskkonna loomine. OECD TALIS tulemused*. Tallinn: Tallinn University Centre of Educational Research.

Marks, G.N. 2005. Accounting for immigrant non-immigrant differences in reading and mathematics in twenty countries. *Ethnic and Racial Studies* 28(5): 925–946.

Mere, K., R. Priit, and T.M. Smith. 2006. Impact of SES on Estonian Students' science achievement across different cognitive domains. *Prospects* XXXVI(4): 497–516.

Monakov, A., and S. Ševtšenko. 2003. Vene õppekeelega koolide üleminekust uuele õppekavale ja uutele matemaatikaõpikutele. In *Koolimatemaatika 30*, 51–54. Tartu: Tartu Ülikoolikirjastus.

NEQS—The National Examinations and Qualification Centre . 2010. Statistika. http://www.ekk.edu.ee/.

OECD. 2007a. *PISA 2006: Science competencies for tomorrow's world, volume 1: analysis*. Paris: OECD.

OECD. 2007b. PISA 2006: Science competencies for tomorrow's world. www.oecd.org/dataoecd/30/62/39704344.xls.

OECD. 2009. *PISA Data analysis manual. SPSS*, 2nd ed. Paris: OECD Publishing.

OECD. 2010. *PISA 2009 results: What makes a school successful? Resources, policies and practices*, vol. IV. Paris: OECD Publishing.

Ogbu, J.U., and H.D. Simons. 1998. Voluntary and involuntary minorities: A cultural-ecological theory of school performance with some implications for education. *Anthropology and Education Quarterly* 29(2): 155–188.

Pavlenko, A. 2008. Multilingualism in post-Soviet countries: Language revival, language removal, and sociolinguistic theory. *International Journal of Bilingual Education and Bilingualism* 11(3&4): 275–314.

Platt, L. 2005. The intergenerational social mobility of minority ethnic groups. *Sociology* 39(3): 445–461.

Portes, A., and L. Hao. 2004. The schooling of children of immigrants: Contextual effects on the educational attainment of the second generation. *Proceedings of the National Academy of Sciences* 101: 11920–11927.

Priedīte, A. 2005. Surveying language attitudes and practices in Latvia. *Journal of Multilingual and Multicultural Development* 26(5): 409–424.

Raudenbush, S.W., and A.S. Bryk. 2002. *Hierarchical linear models: Applications and data analysis methods*, 2nd ed. Newbury Park: Sage.

Rozenvalds, J. 2010. The Soviet heritage and integration policy development since the restoration of independence. In *How integrated is Latvian society? An audit of achievement, failures and challenges*, ed. N. Muižnieks, 33–60. Riga: University of Latvia Press.

Saar, E. 2008. Haridus. Uuringu Eesti ühiskonna integratsioonimonitooring 2008 Aruanne. http://www.meis.ee/raamatukogu.

Saar, E., and K. Lindemann. 2008. Estonia. In *Europe enlarged: a handbook of education, labour and welfare regimes in Central and Eastern Europe*, ed. I. Kogan, et al., 151–181. Bristol: Policy Press.

Schnepf, S.V. 2007. Immigrants' educational disadvantage: an examination across ten countries and three surveys. *Journal of Population Economics* 20: 527–545.

Sørensen, A.B., and M.T. Hallinan. 1977. A Reconceptualisation of school effects. *Sociology of Education* 50(4): 273–289.

Statistics Estonia. 2010. Statistical Database. www.stat.ee.

Trapenciere, I. 2008. Latvia. In *Europe enlarged: a handbook of education, labour and welfare regimes in Central and Eastern Europe*, ed. I. Kogan, et al., 213–240. Bristol: Policy Press.

Van de Werfhorst, H., and F. van Tubergen. 2007. Ethnicity, schooling, and merit in the Netherlands. *Ethnicities* 7(3): 416–444.

Zepa, B., Oksana Žabko, and L. Vaivode. 2008. *Language. Report*. Riga: Baltic Institute of Social Sciences.

Zepa, B. 2010. Education for social integration. In *How integrated is Latvian society? An audit of achievement, failures and challenges*, ed. N. Muižnieks, 189–222. Riga: University of Latvia Press.