



# The unintended and intended academic consequences of educational reforms: the cases of Post-Soviet Estonia, Latvia and Russia

Tatiana Khavenson & Martin Carnoy

To cite this article: Tatiana Khavenson & Martin Carnoy (2016): The unintended and intended academic consequences of educational reforms: the cases of Post-Soviet Estonia, Latvia and Russia, Oxford Review of Education, DOI: [10.1080/03054985.2016.1157063](https://doi.org/10.1080/03054985.2016.1157063)

To link to this article: <http://dx.doi.org/10.1080/03054985.2016.1157063>



Published online: 21 Mar 2016.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

# The unintended and intended academic consequences of educational reforms: the cases of Post-Soviet Estonia, Latvia and Russia

Tatiana Khavenson<sup>a</sup> and Martin Carnoy<sup>b</sup>

<sup>a</sup>National Research University Higher School of Economics, Moscow, Russia; <sup>b</sup>Stanford University, USA

## ABSTRACT

In this paper, we try to unravel some of the unintended and intended academic effects associated with post-Soviet educational reforms by focusing on three cases: Estonia, Latvia and Russia. We have chosen this comparison because a unique ‘natural experiment’ in the three countries allows us to compare the changing academic performance on an international test of a largely similar population in the three countries—Russian origin students attending Russian-medium schools—subjected to three variations of post-Soviet reforms. We find that relative to students in Russia, Russian-medium students in the Baltics made significant gains in the Programme for International Student Assessment (PISA) test. In Latvia, these appear to be an unintended effect of somewhat ‘softened’ state language policies, the conditions surrounding minority rights, and the general context of maintaining social cohesion. In Estonia, the (later) relative gains of Russian students appear to an intended effect of locally grown educational (and language) policies and increased, more effective cooperation with Russian medium schools to further improve PISA performance in a relatively high scoring, PISA-focused country.

## KEYWORDS

State legitimization; language policy; natural experiment; educational reforms; achievement gains

## 1. Introduction

The former Soviet Republics and former Soviet occupied Eastern Europe have provided a rich source of data for studying educational reform, with good reason. The collapse of the Soviet Union in 1989–1991 and the resulting ‘independence’ of 28 countries have produced major curricular and sometimes structural changes in education systems long under control of the Soviet party-state. The extensive literature on post-Soviet educational change in the transition societies of Europe and Central Asia suggests that the educational reforms in former Soviet and Soviet controlled societies after 1989–91 were driven primarily by the dismantling of communist party-state ideology and the need to legitimise new states, sometimes with detrimental effects on social cohesion (see, for example, Heyneman, 1998, 2000; Silova, 2004). In this literature, the academic consequences of these reforms are assumed to

be positive but secondary to their larger political and ideological objectives (Silova, Johnson & Heyneman, 2007).

Analysing such academic consequences is difficult because of lack of earlier comparable student achievement data in the Soviet period. An added complexity is that once international data did become available, internationally measured student performance gradually became intertwined with state legitimacy. Reform objectives in the immediate post-Soviet period focused on realigning ideological elements of existing educational systems with the economic and political structures of the new states. Once part of a rapidly globalising world economy, however, many of these newly independent states were influenced by the emerging global ideology of international academic performance as a measure of state legitimacy.

In this paper, we try to unravel some of the unintended and intended academic effects associated with post-Soviet educational reforms. We focus on three cases: Estonia, Latvia and Russia. A rare 'natural experiment'<sup>1</sup> allows us to compare the changing performance on an international test of a similar population in the three countries—Russian speakers attending Russian-medium schools—subjected to three variations of post-Soviet reforms.<sup>2</sup> The Russian-speaking students living in Latvia and Estonia had regional contextual experiences that distinguished them in some ways from the average student living in Russia, as do students in different regions within Russia. Yet the cultural and school experiences of Baltic Russian students have also been much like the experiences of students in Russia proper, particularly when Baltic Russian students are compared to Russian students in Russia with similar family resources. Most important, a unique feature of the Latvian, Estonian and Russian cases is that the educational reforms implemented had different sources, different features, and different timing, and this, in turn, makes it possible to link some aspects of educational policy changes with academic outcomes.<sup>3</sup>

Beginning in the mid-1990s, Russia and the Baltic states began participating in international tests that permitted student achievement comparisons between them. By 2006, all three countries were administering the Programme for International Student Assessment (PISA) test, developed at the Organisation of Economic Cooperation and Development (OECD) in Paris (OECD, 2014). The OECD promotes nations' average international test performance as an indicator of the wealth of nations, of the possibilities for future economic growth (Hanushek, Peterson, Woessmann & Summers, 2013), and of state legitimacy—thus, as an important element of national identity. The PISA test focuses on '... young people's ability to use their knowledge and skills to meet real life challenges, rather than on the extent to which they have mastered a specific school curriculum' (OECD, 2001b, p. 14).

PISA surveys 15-year-olds in each country and tests them in mathematics, reading and science. In Latvia and Estonia, the test data are organised so that students in local language and Russian-medium schools can be identified, and the test is taken in either language. The performance of local language medium and Russian-medium school students can be traced from 2003 to 2012 in Latvia and 2006 to 2012 in Estonia. PISA achievement data are available for students in Russia in all PISA applications from 2000 to 2012. One indication of the similarity among Russian students in the three countries is that 15-year-old Russian-speaking students who had attended their early schooling in Latvia and Estonia before the educational reforms were implemented scored about the same on an international test as students in Russia.

As in most other former SSRs, Estonia and Latvia's educational reforms were primarily focused on national language policy and how to deal with Russian medium schools. But

as in the former Soviet satellites in Eastern Europe, reforms in Estonia and Latvia were also influenced—for national security, economic and cultural reasons—by the larger political imperative of incorporation into the European Union (Park, 2006; Silova, 2004, 2006). The influence included adhering—or at least paying attention to—EU requirements on minority rights. In turn, this appears to have attenuated even more nationalistic state language policies regarding Russian medium schools and broader policies regarding the rights of Russian-speaking minorities (European Commission against Racism and Intolerance, 2006, p. 18; 2010, p. 23; 2012, pp. 23–24; Park, 2006; Riigi Teataja, 2010; Silova, 2004, 2006).

Others have used a ‘policy borrowing’ framework to analyse Baltic (particularly Latvian) educational policies after 1991 in the context of these conflicting forces (Silova, 2004). The borrowing framework provides interesting insights into the course of educational policies in this period, but we will argue that educational policies in the Baltics and Russia in the past 25 years were largely home grown, not borrowed. We suggest that a more useful theoretical model to understand policies’ continuing evolution in Russia, Latvia and Estonia is the ‘education as compensatory legitimation’ model originally developed by Offe (1976) and Weiler (1983). In that model, educational reforms are a mechanism of state policies aimed at legitimating the state’s authority in a conflicted civil society. The post-war German social class conflict context featured in Offe and Weiler’s work differs from the ethnic (socio-cultural) conflicts in the Baltics after 1991. Yet, the underlying framework of state bureaucracies seeking legitimation through educational policies that transform social conflicts into bureaucratically attainable objectives continues to be useful. Indeed, many analysts who focus on ‘policy borrowing’ also view it as functioning primarily to meet broader political goals associated with nation-state legitimacy (Halpin & Troyna, 1995; Phillips, 2006).

Educational policies that primarily serve to legitimate the state do not necessarily result in educational (or social) improvement (for a partial review, see Phillips, 2006; Weiler, 1983). In our study, the relationship between transition policies and student academic achievement is even more complex. Educational reforms in Latvian and Estonian schools beginning in the late 1980s certainly included efforts to ‘improve’ teaching and learning. Nevertheless a main thrust of educational policy in the Baltics in the 1990s and 2000s was a series of language reforms (European Commission, 2015a, 2015b; Government of Latvia, 2014a; Logvina, 2014). Their primary purpose was to respond to the imperative of defining national identity and meeting the political conditions for joining the EU (Ivlevs & King, 2014; Park, 2006; Silova, 2004). There is no evidence that they were intended to raise student achievement, especially for Russian-medium students.

Yet we find that relative to students in Russia, Russian-medium students in the Baltics made significant gains in the PISA test. We suggest that, particularly in Latvia, the increases in international test scores were an unintended side effect of somewhat ‘softened’ state language policies, the conditions surrounding minority rights, and the general context of maintaining social cohesion (Heyneman, 2000; Silova, 2004). In Estonia, we argue, gains came later, and were mainly the result of a new form of state legitimation through education—the development of locally grown educational policies and eventual cooperation with Russian medium schools to further improve Estonia’s PISA performance.

The relatively low PISA scores in Latvia and Russia are hardly the stuff of compensatory legitimation, but neither do they threaten state legitimacy. Ministries of education in both countries pay attention to PISA scores every three years, but there is no evidence of concerted efforts to reform education especially to increase PISA scores. In Estonia, however, where

(Estonian-speaking) students scored high the first time they took the PISA test in 2006, PISA performance confirms the ‘excellence’ of curriculum and teaching in the Estonian education system, thus legitimising the Estonian state and contributing to a positive Estonian identity. But because students in Russian-medium schools in Estonia also take the PISA test and bring down Estonian average performance, earlier laissez-faire attitudes toward Russian-medium schools have more recently turned into efforts by the Estonian state to influence their curriculum and teaching methods to raise PISA performance (Estonian Basic Schools and Upper Secondary Schools Act – Riigi Teataja, 2010; Logvina, 2014; Republic of Latvia (n.d.)). This, we suggest, was a response to more global notions of national identity defined by performance on international tests and the ideology of national student achievement rankings as a measure of state legitimacy (Carnoy, Khavenson & Ivanova, 2015).

In order to examine these ideas, we analyse the pattern of academic achievement in the 1990s and 2000s in the two Baltic countries and Russia, specifically focusing on comparisons between students in local language and Russian language schools and comparing both to the performance of students in Russia. As stated above, we compare the performance over time of Russian-language students attending Russian-language schools in the Baltics with those in Russia to support our argument—without claiming causality—that Baltic country reforms (compared rather unchanged school policies in Russia) may have had a significant impact on student test performance. Extensive interviews in schools and with policy makers in each country provide the qualitative data to link policies with the patterns of academic outcomes.

Our analysis will proceed as follows: in the next section, we provide the analytical and historical background to the study; in Section 3, we discuss Russia’s, Estonia’s and Latvia’s specific post-Soviet educational reforms from the standpoint of the education as state legitimisation literature; Section 4 describes the data and methodology for our quantitative and qualitative analysis; Section 5 presents the quantitative results; Section 6 discusses the results of our interviews in schools and with policy makers; and Section 7 concludes.

## 2. Background to the reforms

With the collapse of the Iron Curtain and the Soviet Union in 1989–1991, 15 newly independent countries emerged and 13 countries regained their historic autonomy.<sup>4</sup> They had to establish new economic systems and governmental, social and other institutions, including new education systems. In doing so, they confronted a common set of challenges in reforming Soviet education (Heyneman, 2000).

Once incorporated as Soviet Socialist Republics (SSRs) after the Second World War, many Russians were moved to the Baltics and were employed in the military bureaucracy and in the region’s many Soviet enterprises. Teachers for the education system were trained in Soviet-run pedagogical institutes. Although local languages were used in the schools for local language speakers, Russian students had their own Russian language schools, and the percentage of Russian students attending Russian schools increased greatly. Russian was taught four times per week in Latvian and Estonian schools, parallel courses were taught in Russian at local universities, and the Russian language was privileged in many aspects of local life (Silova, 2006).

With the collapse of the Soviet Union, and the independence of the Baltics, many of the more highly skilled Russians left for Russia. Yet, most Russians stayed, mainly because of more

favourable economic conditions than in Russia (Raun, 2009). For Latvians and Estonians (and Lithuanians), the very essence of national identity was national language, and the education system was and is the main institution for preserving and promoting local language (Silova, 2002). Citizenship and national 'loyalty' meant speaking Latvian or Estonian. But for most Russian speakers, Russian language learning in 'their' schools and the right to use Russian 'officially' as in the past was also crucial to maintaining identity.

Overlaying this language conflict, which clearly reflected both symbolic and objective state power relations, was another imperative, also tied into historic expressions of national identity and state power—one that implied giving up some national sovereignty to international regulation and norms. A pillar of Latvian and Estonian national politics in the 1990s was incorporation into the European Union. European criticism of early 'over-nationalistic' language and education policies in the Baltics may have played at least some role in forcing a more accommodating policy toward the Russian minority in Baltic citizenship requirements and education reforms (Park, 2006).

### 3. Analysing Policy Reforms

The underlying premise of the compensatory legitimization analysis of educational reforms is that the capitalist state faces a 'crisis of legitimacy'—a crisis that derives from the class structure of capitalist society and the difficulty for the state to at once distribute social goods and services unequally yet legitimately (Habermas, 1975; Weiler, 1983).

... without adequate legitimization, the state would either have to assert its authority through coercion, with the resulting danger of massive resistance, or it would continuously have to 'purchase' legitimacy through various kinds of material gratification—an unrealistic strategy in view of the finite nature of the state's resources. Faced with this dilemma, the retrieval of legitimacy becomes a matter of central concern for those who hold the state's authority. (Weiler, 1983, p. 261)

The importance of public schooling in ostensibly allocating jobs and status in modern economies makes it a prime candidate for compensatory legitimization. The state seeks legitimacy in part through shifting public attention to reforms that would appear to create greater mobility and equality through 'more and better schooling' (see, for example, Bowles & Gintis, 1976). This despite the likelihood that such '... reform policies with their associated rhetoric tend to generate expectations and needs which, given the highly limited capacity of the capitalist state for genuine change, they ultimately prove unable to meet' (Weiler, 1983, p. 261).

In Russia, educational reforms after 1991 focused mainly on the expansion of higher education (Carnoy et al., 2013), the creation of select academic secondary schools, and giving more control to local authorities for running primary and secondary education.

Nevertheless, most teachers in Russia, even with autonomy, still use methods and teach mathematics and Russian in the 'old style', mainly because most of the teachers teaching in the system were trained before 1991 and because many textbooks have not been significantly changed. The maintenance of much traditional curriculum and pedagogy, increasingly rooted in a growing conservative nationalism, continues until now despite OECD efforts in the past decade to 'scandalise' countries such as Russia for their low PISA scores (Steiner-Khamsi, 2006).<sup>5</sup>

In contrast, educational reforms in the Baltics introduced major curricular changes, with the caveat that Estonia, alone among Soviet Socialist Republics, had managed to re-establish

a national Estonian curriculum in Estonian medium schools even under Soviet rule. These reforms logically focused on recovering national identity, particularly through language policies, and the printing of textbooks locally.

Estonia and Latvia, in contrast to Russia, developed their new educational reforms in a highly anti-colonial, nationalistic context, seeking to separate themselves from years of occupation by a repressive foreign power (Raun, 2009). Simultaneously, the reforms evolved in a highly internationalised context. Reformers had to assure that reforms were consistent with entry into the European Union. Reforms therefore 're-nationalised' education, but allowed Russian medium schools to continue teaching mainly, if not entirely, in Russian. Language policies in the Baltics were largely home grown and unambiguous. Latvian was officially declared the state language in 1988 during *perestroika*, and a series of further laws in the 1990s strengthened the state's position that all other languages were considered foreign (OECD, 2001b). Latvian was considered the 'national language of reunification'. The education law of 1998 made Latvian the exclusive medium of instruction in public colleges and universities as of 1999 (Staklis, 2005). When Latvia ratified the Council of Europe's Framework Convention for the Protection of National Minorities in 2005, the Latvian parliament reserved the right to limit the implementation of Articles 10 and 11, which give language minorities the right to deal with government authorities in their minority language.<sup>6</sup> Until 2013, foreigners who had moved to Latvia after 1938 had to pass a test in Latvian to apply for citizenship. Estonia also passed laws in the late 1980s and in 1995 establishing Estonian as the national language and declaring all other languages foreign. Local Russian applicants applying for Estonian citizenship needed to pass two exams in Estonian.<sup>7</sup> And, as in Latvia, Estonian public universities require all courses to be taught in Estonian, which effectively restricts entry to most graduates of Russian-medium secondary schools.

The two countries differ considerably, however, in their implementation of local language policy in Russian medium schools. Estonian language/curriculum reforms in the 1990s and early 2000s were much less aggressively and more flexibly applied to Russian medium schools than they were in Latvia. One important reason for this difference may have been the distribution of the Russian-speaking school population. Many Russian medium schools in Latvia are in the capital, Riga. In Estonia, the Russian population is concentrated in the north-eastern part of the country near the Russian border, (including the city of Narva), although there are a number of Russian-medium schools in Tallinn.

The education law of 1998 mandated Latvian language to be introduced in a flexible fashion in primary schools (grades 1 to 9) according to different models at the discretion of the Russian-medium schools themselves. Despite (or perhaps because of) this flexibility, by the early 2000s, many Russian first and second graders were learning to read Latvian along with Russian (different alphabets). The 1998 education law, in addition to mandating Latvian as the sole instructional language in universities, required Russian-medium secondary schools (grades 10 to 12) to teach courses in Latvian in a 60/40 proportion beginning in 2004 (Republic of Latvia (no date), Article 9). While the Latvian requirement in primary schools met with little resistance because of the wide range of options available, the secondary school language requirement became a source of political conflict between the Russian minority community and the government, resulting in more gradual implementation of the rule, but implementation nevertheless (Erss et al., 2014; Government of Latvia, 2014b; Ivlevs & King, 2014; OECD, 2001a, 2001b).

In contrast, as late as 2006, Russian-medium primary and secondary schools in Estonia were teaching mostly in Russian. They did not have to follow strict curriculum guidelines until the secondary school language ruling of 2007, which required 60 percent of the curriculum of Russian-medium upper secondary schools to be taught in Estonian by 2011 (Siiner, 2014). Even this requirement was implemented with a certain degree of flexibility and school-by-school, avoiding the resistance to Latvia's similar 2004 law (Siiner, 2014).<sup>8</sup> We will argue below that increased attention in Estonia to Russian-medium education was driven as much by a new source of state compensatory legitimation, namely Estonia's high scores on the PISA test of 2006 and the large gap on that test between Estonian and Russian medium students.

#### 4. Methodology

Our objective in this study is to understand the relationship between policies linked to state compensatory legitimation in transition societies and student academic performance in school. In most of the period covered, educational reforms were not directly related to improving student learning, so it would not be surprising to find no relation to student academic achievement gains.

Ivlevs and King's (2014) estimates of the effects in grades 10–12 of the 2004 Latvia's 60/40 local language requirement are an important referent for our study. Ivlevs and King are able to compare the relative performance of Russian-medium students on the Latvian school-leaving exam in the period 2001–2012 before and after the implementation of the reform in 2004. Their results show a significant negative effect on the results of the exam of requiring students in Russian-medium secondary schools *to receive most of their instruction in Latvian and of having to take an exam given only in Latvian* (although students could answer the questions in Russian). The negative effects were much larger in the sciences than in mathematics. Even after the reform, however, Russian-medium students continued to score significantly higher than Latvian-medium students in both mathematics and physical sciences.

Our methodology is necessarily more indirect than Ivlevs and King's and focuses on a different comparison to analyse the reforms, namely how Russian-medium students in both Latvia and Estonia performed relative to students in Russia as well as to local language medium students in the Baltics on a test (PISA) given in their school-medium language (either local or Russian). We use both quantitative and qualitative methods to make our case (Leech & Onwuegbuzie, 2009; Morgan, 2013; Teddlie & Tashakkori, 2006). In the first stage, we analyse student achievement patterns on PISA (2000, 2003, 2006, 2009 and 2012), which assesses the mathematics, reading, and science skills of 15-year-olds. This analysis is restricted to the years of these tests in which we can make some comparison of student performance between Estonia, Latvia and Russia. Student achievement as measured by the PISA 2003–2012 scores in mathematics, reading and science are our 'dependent variable'. In the second stage of the analysis, we link patterns of PISA gains to educational reform policies, including interviews of local policy makers and school personnel in the three countries.

#### Data

The international test from which we draw our main student achievement data is the PISA, although we show available mean scores for TIMSS tests as well.<sup>9</sup> The PISA test was administered for the first time in 2000, and every three years thereafter (2000–2012). It



tests 15-year-olds in mathematics, reading and science, and collects data on students' backgrounds and study habits, as well as school data from principals' questionnaires. The PISA is vertically scaled and test results are comparable from year to year.

In Latvia and Estonia students took the test in the language of instruction at their school, Latvian or Russian and Estonian or Russian, respectively. Thus, it is possible to analyse local language and Russian language subsamples of the Latvian and Estonian TIMSS samples in 2003 and the Latvian PISA sample in 2003, and the Latvian and Estonian PISA samples in 2006, 2009 and 2012.

For our interviews we visited seven schools in different regions of Estonia, six in Latvia—all in Riga, where a high proportion of Russian medium schools are located—and four schools in Russia, all in the Moscow region. In each school we interviewed a principal and at least one vice-principal. In Estonia and Russia we also visited at least one class in every school. In addition, in Latvia and Estonia, we interviewed officials from the Ministry of Education, people who participated in developing the reforms, and officials in charge of international testing. In Russia we interviewed three educational officials very familiar with educational reforms and the coordinator in charge of international testing. The field study in the Baltic countries was conducted in June and November 2013, and in Russia, in May–June 2013 and September 2014. Although this is a limited number of interviews, they and the visits to the schools provided us with considerable detail on the nature of the reforms and their implementation on the ground.

### ***Models for comparing test results***

An underlying feature of our comparison model of student achievement results is the assumption that students attending local language and Russian medium schools in Estonia, Latvia and Russia are learning reading, mathematics and science in a school culture shaped largely by language of instruction. This culture, we assume, is rooted in a particular observable instructional ideology, yet is also influenced over time by educational policies in each of the three countries' national space.

We also assume that to come closer to identifying the effects of educational policy differences we need to 'adjust' measured student achievement for non-school variables that influence achievement. The most important of these is socio-cultural status (SCS) (Khandker, Koolwal & Samad, 2009; Sirin, 2005; K. R. White, 1982; S. B. White, Reynolds, Thomas & Gitzlaff, 1993). We therefore report all comparisons of student achievement scores on TIMSS and PISA by students divided into socio-economic background groups. We and others have argued elsewhere (Carnoy et al., 2015; Chudgar, Luschei, Fagioli & Lee, 2012) that SCS indicators are highly correlated with each other and that in developed countries, books in the home and mother's education are reasonably reliable proxies for SCS.

Because all three countries participated in the PISA test in 2006–2012, we are able to estimate PISA scores for students in different types of schools in each country compared to Russian-medium schools in Russia, a model that controls for SCS as measured by both mother's education and number of books in the home

$$A_{iS} = \alpha_0 + \sum \beta_j X_{ij} + \delta_i Y_i + \sum \gamma_k (C * L)_{ik} + \mu_j + e_i \quad (1)$$

where  $A_{iS}$  = student  $i$ 's PISA score in subject  $S$  (mathematics, reading or science);  $X_{ij}$  = a vector of student  $i$ 's socio-cultural background characteristics  $j$  (student's reported mother's

education and number of books in the home);  $Y_i$  = the average books in the home reported by peers sampled in student  $i$ 's school);  $(C^*L)_{ik}$  = a series of dummies for student  $i$ 's country\*language of instruction group; and  $\mu_i$  and  $e_i$  = error terms.

The influence of educational policies may be heterogeneous across country-language groupings. Therefore, in addition to estimating models that include SCS variables, we estimate Model (1) for three separate groups: low SCS (0–25 books in the home), middle SCS (26–200 books in the home), and high SCS (more than 200 books in the home).<sup>10</sup>

This allowed us to check the consistency of results and examine the interaction between SCS and 'national culture'. Also students with different SCS may vary both in the level of their performance and in the changes in performance over time. Inasmuch as studying the whole country sample can lead to spurious results, we interpret models for SCS groups separately (Carnoy et al., 2015; Cochran, 1968).

## 5. Results

Table 1 shows that Latvian students made large gains on all three sections of the PISA in 2000–2003, and then test scores levelled off until 2012. Similarly, Latvian scores went up in TIMSS mathematics and science in 1995–2003. Russian students, on the contrary, lost ground on the PISA mathematics and reading. They only made large gains in 2009–2012, and made a large gain in science in 2000–2003, then levelled off. The time pattern of Russian student performance is the same on the TIMSS, with scores falling from high levels in 1995 and 1999 and only recovering in 2011. The other story these scores tell is that students in Estonia performs better on both PISA and TIMSS in all subjects.

Since the PISA scores are for 15-year-olds and the TIMSS scores for 8<sup>th</sup> graders, we should keep in mind the economic conditions and reforms taking place when these students were

**Table 1.** Average PISA and TIMSS Scale Scores, by Country and by Subject Tested, 1995–2012.

	Year				
	2000	2003	2006	2009	2012
<i>Pisa Mathematics</i>					
Latvia	463	483	486	482	491
Estonia			515	512	521
Russia	478	468	476	468	482
<i>Pisa Reading</i>					
Latvia	458	491	479	484	489
Estonia			501	501	516
Russia	462	442	440	459	475
<i>Pisa Science</i>					
Latvia	460	489	490	494	502
Estonia			531	528	541
Russia	460	489	479	478	486
	Year				
	1995	1999	2003	2007	2011
<i>TIMSS Mathematics</i>					
Latvia	493	505	508		
Estonia			531		
Russia	535	526	508	512	539
<i>TIMSS Science</i>					
Latvia	485	503	512		
Estonia			552		
Russia	538	529	514	530	552

Source: OECD, PISA, Microdata, 2000, 2003, 2006, 2009, 2012. IEA, Microdata, 1995, 1999, 2003, 2007, 2011.

**Table 2.** The trends in per capita GDP in the three countries for the period 1990–2010.

Per capita GDP at current prices - US dollars					
	1990	1995	2000	2005	2010
Estonia	3550	3061	4165	10566	15010
Latvia	2796	2208	3309	7165	11417
Russia	3485	2688	1770	5308	10618

Source: United Nations Statistics Division (2012). *National Accounts Estimates of Main Aggregates*; for Latvia, 1990, 2000, 2005: *World Development Indicators* database.

in primary school, perhaps the most important stage of their knowledge acquisition, in a period beginning in first grade, 8–9 years before the year they took the TIMSS or PISA test. One explanation of the Latvian/Russian contrast could be that the Russian economy was hit much harder and longer by the transition than the Latvian (or Estonian) economy, and that the long recession in Russia, which only began to recover in 1998, had a negative effect on student learning.

The trends in per capita GDP in the three countries for the period 1990–2010 are shown in Table 2.

These average scores, however, do not tell us about the relative performance of local language and Russian speaking students on these tests, nor do they account for differences in the socio-cultural background composition of the students in each country in each year.

### ***Using regression analysis to estimate ethnic/country test score changes***

To make comparisons among country-language groups, we estimate the model in Equation (1). Table 3 presents these estimates. The country language group coefficients estimate in 2006, 2009, and 2012 the difference in performance on the PISA mathematics, reading and science tests of students in Russia and students attending Estonian medium, Latvian medium, and Russian medium schools in Estonia and Latvia. The estimated test score differences are ‘adjusted’ for individual students’ books in the home and mother’s education, which vary between samples, as well as the standardised value of average books in the home reported in the sample of students in each school.

The results in Table 3 suggest that SCS variables at the individual and school level are highly significantly related to test scores, but that even so, there are also significant differences in how students in different medium schools in the three countries perform. There are also trends in the differences that have favoured Russian language students attending Russian medium schools in Estonia and Latvia. These trends vary somewhat across subject matter, but not enough to change the general conclusion that Russian medium students in the Baltics made larger gains than students in Russia and larger gains than local language speaking students in the Baltics.

The estimates in Table 3 also show that Estonian students in Estonian medium schools scored higher in all subjects and all years. However, by 2012, students in Russian medium schools in Latvia had increased their PISA reading performance sufficiently to make the difference between their and Estonian language students’ reading scores statistically insignificant.<sup>11</sup> Further, the estimates suggest that Russian language students in both Estonia and Latvia generally made their major gains *after 2006*. Even in reading, where Russian students in Latvia already had scores similar to their Latvian language counterparts and higher than

**Table 3.** Estonia, Latvia, and Russia: Estimates of Ethnic/Country Effect Size Differences in PISA Scores, by Subject and Socio-cultural Status, 2006–2012.

Variable	MATHEMATICS			READING			SCIENCE		
	2006	2009	2012	2006	2009	2012	2006	2009	2012
26–200 Books/Home	0.30*** (0.04)	0.26*** (0.03)	0.39*** (0.04)	0.37*** (0.05)	0.34*** (0.04)	0.33*** (0.04)	0.33*** (0.04)	0.29*** (0.04)	0.42*** (0.04)
>200 Books/Home	0.60*** (0.05)	0.54*** (0.04)	0.64*** (0.05)	0.58*** (0.05)	0.60*** (0.04)	0.59*** (0.05)	0.55*** (0.05)	0.58*** (0.04)	0.66*** (0.04)
Mother's Ed < Secondary Complete	-0.28** (0.13)	-0.14 (0.09)	-0.28** (0.11)	-0.26** (0.11)	-0.25** (0.11)	-0.19* (0.11)	-0.25** (0.10)	-0.18* (0.11)	-0.21** (0.10)
Mother's Ed University Complete	0.17*** (0.04)	0.25*** (0.05)	0.22*** (0.05)	0.14*** (0.04)	0.22*** (0.04)	0.31*** (0.05)	0.16*** (0.03)	0.24*** (0.05)	0.29*** (0.05)
Mother's Ed Missing	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Standardised Avg. BH/ School Sample	0.17*** (0.03)	0.21*** (0.04)	0.16*** (0.03)	0.22*** (0.03)	0.23*** (0.03)	0.25*** (0.03)	0.19*** (0.03)	0.19*** (0.04)	0.19*** (0.03)
Estonian-Estonia	0.38*** (0.05)	0.52*** (0.06)	0.47*** (0.06)	0.63*** (0.05)	0.41*** (0.05)	0.47*** (0.06)	0.52*** (0.04)	0.58*** (0.06)	0.67*** (0.05)
Russian-Estonia	-0.08 (0.07)	0.12 (0.08)	0.20*** (0.07)	-0.13 (0.08)	0.14** (0.07)	0.19*** (0.06)	-0.01 (0.07)	0.20*** (0.07)	0.37*** (0.07)
Russian-Latvia	-0.02 (0.07)	0.16** (0.08)	0.21*** (0.07)	0.22*** (0.07)	0.24*** (0.06)	0.39*** (0.07)	-0.09* (0.06)	0.12 (0.07)	0.27*** (0.06)
Latvian-Latvia	0.04 (0.05)	0.24*** (0.05)	0.17*** (0.05)	0.35*** (0.05)	0.33*** (0.04)	0.21*** (0.05)	0.04 (0.05)	0.26*** (0.05)	0.28*** (0.05)
Constant	-0.55*** (0.05)	-0.69*** (0.06)	-0.55*** (0.07)	-0.83*** (0.05)	-0.67*** (0.06)	-0.50*** (0.06)	-0.61*** (0.04)	-0.70*** (0.06)	-0.68*** (0.06)
R <sup>2</sup>	0.12 15157	0.15 14187	0.13 13884	0.15 15157	0.17 14187	0.18 13884	0.13 15157	0.13 14187	0.17 13884

Source: OECD, PISA 2006, 2009, 2012, Microdata.

Notes: Reference dummy variables; 0–25 Books in the Home; Mother's Education = Secondary Complete; Russians in Russia. \*\*\*p&lt;0.01; \*\*p&lt;0.05; \*p&lt;0.1. Standard errors in parentheses.

Russian students in Russian schools, they made substantial relative gains in 2006–2012. By 2012, Russian medium students in Latvia were performing as high or higher than Latvian medium students in all three subjects.

The number of students studying in Russian medium schools in Latvia declined rapidly in this period, from 39% in 1995/96 to 27% in 2006/07 (Ivlevs & King, 2014). Part of this was probably due to emigration, part due to the closing of some Russian high schools, resulting in shifts to Latvian medium schools. Whether high or low-scoring students shifted to Latvian medium schools could have affected our results, but it is somewhat unlikely that the better Latvian speakers who shifted were lower academically performing students.

### ***Heterogeneity in language-country PISA performance gains***

We also tested the heterogeneity of the gains in PISA test scores in 2006–2012 across three groups of students: those with 0–25 books in the home (low SCS); those with 26–200 books in the home (middle SCS); and those with more than 200 books in the home (high SCS).

The results suggest that, in mathematics, the gains for all groups in 2006–2012 relative to the performance of Russian students in Russia were greater for the highest socio-cultural groups in Latvia and Estonia whether in Russian medium or local language medium schools. Russian medium students in the middle SCS also made significant gains in mathematics relative to students in Russia and local medium schools in Latvia and Estonia.

In reading, students in Russian medium schools in Estonia and Latvia made relative gains in reading compared to their Russian counterparts in Russia and their local language counterparts in the Baltics, and the gains were largest in the lowest socio-cultural group (0–25 books in the home)—the opposite of the results in mathematics.

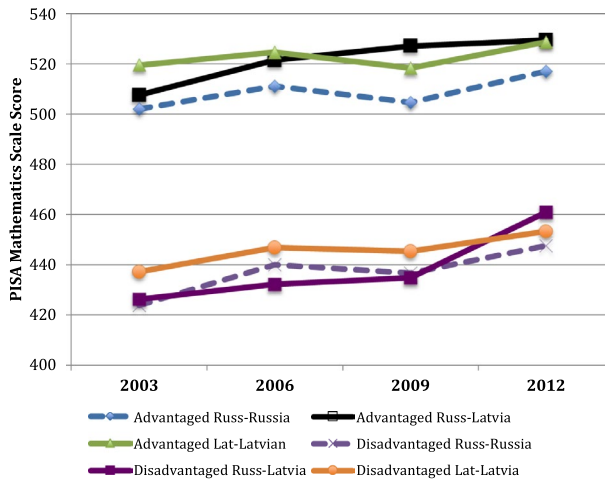
In science, both local language students and Russian medium students made large gains in 2006–2012 in all three socio-cultural groups relative to Russian students in Russia. As in reading, the largest relative gains tended to be in the lowest socio-cultural group (tables available from authors on request).

The timing of these gains of Russian medium students in the six-year period does not appear to be noticeably different in Latvia and Estonia, except that the gains seem to have started later in mathematics for Russian medium students in Estonia (after 2009) and earlier in reading for Russian medium students in Latvia (before 2006) (Table 3). We do have pre-2006 comparable PISA data for Latvia and Russia to check whether this pattern of gains began earlier.

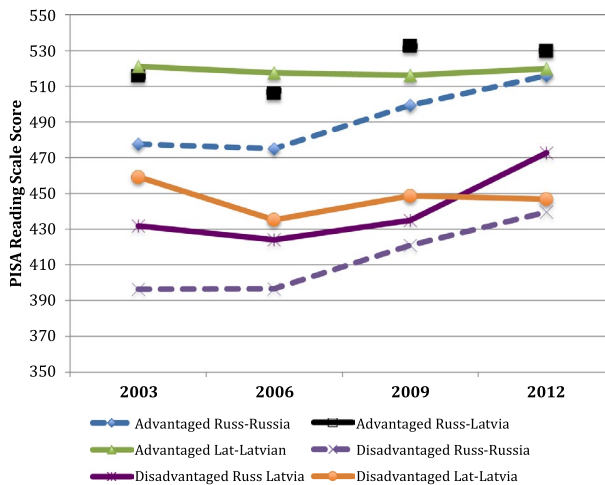
The PISA performance results in mathematics and reading for Russian and Latvian medium schools in 2003–2012 are shown in Figures 1a and 1b. The results for science (not shown) are almost identical to those for mathematics.

The trajectories suggest that Russian medium students in Latvia had very similar mathematics and science scores to Russian medium students in Russia at the beginning of the period, but that Latvian Russian-medium students made greater gains in 2003–2012. In reading, however, Russian Latvian students had begun to make their gains earlier (or perhaps scored higher even before the reforms). Given that bilingual policies began in primary schools in the late 1990s, it would not be surprising that by 2003, Russian-medium students' reading scores would have been higher than in Russia.

In Estonia, at least in mathematics, the relative gains for Russian medium students appear to have begun much later, in 2009. The most striking difference in PISA score patterns for



**Figure 1a.** Latvia: PISA Mathematics scale scores by ethnicity and advantaged and disadvantaged group, 2003–2012. Source: OECD, PISA microdata file, 2003, 2006, 2009, 2012.



**Figure 1b.** Latvia: PISA Reading scale scores by ethnicity and advantaged and disadvantaged group, 2003–2012. Source: OECD, PISA microdata file, 2003, 2006, 2009, 2012.

Russian medium students in Estonia and Latvia is in reading. Russian medium students in Latvia already had significantly higher PISA reading scores than Russian students in Russia in 2003, although this difference was not significant for lowest SCS students. By 2012, Russian medium students scored significantly higher in reading than Latvian language students. Russian medium students (lower and middle SCS) in Estonia made relative gains in reading in 2009 but only middle SCS students score significantly higher than students in Russia, and the reading scores of Russian medium students in Estonia remained significantly below the scores of their Latvian Russian medium counterparts. All this suggests that the reforms in the Baltic countries as they impacted Russian-medium students had positive effects on

students who, at the beginning of the process, had largely similar academic performance to their Russian speaking student counterparts in Russia.

These differences between student PISA gains in Latvia and Estonia give us clues to the influence of policies in the Baltics regarding Russian medium schools. It appears that policies in Latvia had a major and early positive influence on reading in Russian medium schools. This did not occur until much later and to a smaller degree in Estonia. The policies' influence on mathematics performance for Russian medium students appears to have been similarly important in both Estonia and Latvia relative to performance in Russia, but mainly for middle and higher socio-cultural students.

## 6. How do policy makers and educators explain student academic gains?

*Bilingual education.* As noted, the greater physical presence of Russian medium schools and the Russian population in Riga and the other larger towns of Latvia promoted earlier and greater attention by the Latvian state to Latvian language teaching in Russian medium primary and middle schools than by the Estonian state to Estonian language in Russian medium schools. Despite resistance and some delay, secondary Russian medium schools in Latvia were also made to teach a high percentage of courses in Latvian starting earlier than in Estonia. In addition, many Russian medium schools in Latvia use bilingual textbooks.

Our reasoning regarding the possibly 'unintended' impact on Latvia's Russian-medium students' PISA performance of 'legally-imposed' bilingualism in primary and middle Russian-medium schools conflicts with Ivlevs and King's (2014) analysis of the negative impact of bilingual course requirements in secondary schools on Russian-medium student performance relative to Latvian students. However, it is possible that their results derive from Russian medium students being required to take a school-leaving test written in Latvian. The PISA test is given both in Latvian and Russian. Ivlevs and King also present some evidence that the negative effect they find on achievement is larger for low-scoring students than for high-scoring students, which has some consistency with the more positive results we find on PISA for Russian medium students from families with greater family academic sources (higher SCS).

The school principals we interviewed in Russian-medium schools in Riga consistently pointed out that by the time their students enter secondary school, most had achieved reasonable proficiency in Latvian, and that bilingual education (BE) has played a significant *positive* role in improving their students' achievement in some subjects. Some of our interviewees argued that studying two languages and that switching from one to another during the day (or even during one class) has helped develop students' general academic ability. This improvement, they claimed, extends to the PISA test. Their argument about BE is supported by the higher scores and greater gains made by Russian medium students in Latvia, especially in reading. Another aspect of BE that came out in the Latvian and Estonian interviews is that implementing the teaching of Latvian in Russian schools had positive spinoffs, especially in new ways to assess students, new teaching practices, more teaching material, and more extensive curriculum preparation. Our many interviews in Tallinn and in Narva with policy makers and principals indicated that in contrast to the pressure on Latvia's Russian medium schools to have their students reach a high level of skills in Latvian, Estonian language courses in Russian schools were largely taught as fulfilling Estonian state requirements for national language study until after 2007, and that the broader extension of Estonian language requirement only took place in secondary school. Bilingual programmes

and bilingual objectives were not a major part of the curriculum in basic education as they became in Latvia, and therefore the influence of bilingual policies on students' academic achievement has probably been much smaller in Estonia. One possible way to interpret students' lower PISA reading score gains in Estonian Russian medium schools compared to Latvian Russian medium schools (see Table 3) is the smaller influence of bilingual education in the Estonian system.

Yet eventually Russian medium students in Estonia also began to make relatively large gains on PISA compared to Russian students studying in Russia and to ethnic Estonians students. If bilingual education was not a factor in raising Russian medium student scores in Estonia (Estonian students take the PISA in 9<sup>th</sup> grade, before entering high school), what was? We argue that it was largely the drive to raise already high national average Estonian PISA scores even higher by closing the gap between Estonian and Russian medium students.

*Textbooks.* Mathematics and Russian language education in Russia has remained mostly as it was during the Soviet period. Without exception, Russian law prohibits teachers from using textbooks published outside the country. Although new language textbooks have been published since 1990, they are similar to their Soviet predecessors. In addition, as one of our interviewees in Russia told us, a major problem is that the pedagogical universities continue to prepare language teachers based on old books and curriculum.

In contrast, all our interviewees in both Baltic countries mentioned that textbooks have changed quite substantially from the Soviet period. There is a variation from subject to subject, but the general trend is textbooks with more practical, experimental or applied tasks, with more graphs, tables and other non-textual ways of presenting information to students. Even in Estonia, Russian medium schools were required to purchase Russian language textbooks published in Estonia. Gradually, these incorporated Estonian curricular standards—standards that have, even pre-PISA, been aligned with PISA type test items.

*Professional development courses.* Innovations are unlikely to be adopted unless principals and teachers buy into them. Both Latvian (from the beginning of the 2000s) and Estonian (particularly after 2007) ministries of education offered new and 'modernised' professional developmental courses for teachers. As one of the Estonian Russian medium school principals we interviewed told us, 'Those courses changed our minds from the Soviet to the modern Estonian way of leading schools and even the way of thinking about schooling.' This seems to be important at both the school administration and teachers' levels in Estonia, as these individual attitudinal changes helped in convincing the principals of Estonia's Russian medium schools to accept other changes. As an example of those courses, our informants usually mentioned a focus on developing new teaching practices in all subjects (individualisation, group work, projects, real life relations, etc.), new approaches to assessment and, in Estonia, the development of 'functional reading', as an approach to reading that focuses on critical text analysis. Our interviewees in both Latvia and Estonia regularly emphasised that a major break with Soviet education was that teachers are now trained to assess students' progress individually and to give more advanced students additional tasks.

Our interviews with Russian teachers in Russia suggest that until 2012, in contrast with the Baltics, professional development used to be typically just a formality that teachers are required to have for their evaluations. Currently, although most teachers have gradually 'modernised' their instruction to be more individualised, there appear to be only limited efforts through teacher professional development to introduce new methods of instructional practice, or to coordinate with school principals to implement new methods.



*Implementation.* According to our interviews in the Baltics, the current ‘modern-style’ education of teachers to act with autonomy in the classroom and put more emphasis on student engagement and outside-of-class activities appears to be more ‘interiorised/inter-nalised’ by school principals and teachers in Estonia than in Latvia, where reforms are still seen as coming from the top (see Spreen, 2004, for example, on interiorisation).

*The PISA factor.* An important theme that emerged from our interviews with policy makers, principals and teachers in Estonia was the importance of the PISA test as a measure of national educational quality. As noted, Estonian students had done well on the TIMSS in 2003, and ethnic Estonians’ performance on the PISA the first time they took it in 2006 was also among the highest in Europe. So by 2006, the Estonian state knew that the quality of their education system could be a source of national pride. Doing well on international tests quickly became a symbol of Estonian ‘excellence’—Estonia, like Finland, was able to use its high performance on the PISA test to gain state legitimacy through the emerging global value system of educational ‘rankings.’<sup>12</sup>

Our interviews suggest that Ministry of Education officials in Estonia take national performance on the PISA seriously as an educational policy objective. Since there are only 500 schools in the entire (small) country eligible to participate in PISA and the sample size is 200, getting administrators in likely to be sampled schools to focus well in advance on motivating teachers and students to engage fully with the test is a much easier task than, say, in Russia.<sup>13</sup> This would also apply to Latvia, but our interviews suggest that Latvian educators have been less likely to emphasise performing well on the PISA test than officials in Estonia. Further, some big schools in Estonia are always in the PISA sample. They are quite familiar with the test and, in the context of a national emphasis on PISA performance, are likely to focus on PISA-type items as part of their regular evaluation of students.

Before PISA (2006), Estonian policies regarding Russian-medium schools focused almost entirely on incorporating some Estonian language into the curriculum. Our interviews suggest that after PISA, the Ministry of Education began a gradual push to convince Russian medium school principals to incorporate the Estonian reading curriculum called ‘functional reading’, which is very much in line with the kind of ‘critical text analysis’ tested by the PISA reading instrument. In an interview with a lead policy person in the Ministry, she told us that they had met repeatedly with Russian medium school principals after 2006 to get them to adopt the functional reading curriculum, and they did so, one school at a time. Similarly, Ministry officials worked to convince principals to adopt Estonian science curricula, based on a practical and experimental approach to teaching science, which the principals also did, albeit gradually.

Thus, besides the professional development courses for teachers, Estonian Ministry officials emphasised in their interviews the continuous effort they made, stimulated by the pay-off it would have in higher PISA results, to work through Russian medium school principals to implement curricular and teaching reforms. The Ministry appears to have been successful. In our Estonian interviews with principals in Russian medium schools, they more often said ‘we’—such as, for example, ‘we are moving’, ‘we are changing’, ‘we are trying’, etc.—whereas in Latvia the subject of the new policy interventions was ‘they,’ such as ‘they are changing the textbooks’.

## 7. Conclusions

We have argued that the logic of national language educational reforms in Latvia and Estonia even when conditioned by the requirements of reaching other important political goals (joining the E.U.) was necessarily authentically Latvian and Estonian, couched in new local forms of developing state political legitimacy (Weiler, 1983). Latvia, Estonia and Russia developed educational policies that had distinctly 'national' characters because of each country's distinctive historical and culture context — this even when it came to school language policies in Latvia and Estonia. The national educational policies that evolved were distinctive enough, we argue, that they produced different patterns of academic achievement changes in local language and Russian-medium schools.

We have used a 'natural experiment' to gain insights into the links between varying educational reform policies and student achievement gains on the same test in 2003–2012. Nine years (six in Estonia) is a relatively short span of time to observe possible effects of varying educational policies. However, these years cover an important period of considerable change for Russian medium students, particularly in Latvia and Estonia.

We do not claim to make direct links between compensatory legitimation policies in Russia and the Baltics and patterns of student achievement gains in Russian medium schools in the three countries studied. Yet, we can make a compelling case that the policy of imposing Latvian language requirements on Russian medium schools in the 1990s and 2000s as part of a larger effort to legitimate the state had an 'unintended' and large impact on Russian students' achievement gains because of the positive effects of bilingual education on learning. We characterise these as an 'unintended' impact on school achievement because the objective of the language policies implemented by the Latvian state in Russian medium schools was to promote and legitimise Latvian identity, not to improve students' achievement scores. Since students in Russian medium schools were required to learn Latvian, whereas Latvian students took Russian voluntarily as a second foreign language after required English, the positive effects of bilingualism were more likely to impact learning in Russian medium schools. In addition, we found in our school visits in Latvia that Russian educators were the ones developing bilingual textbooks and other materials to enhance learning under bilingual requirements. Estonian educators we interviewed were also concerned with improving education, but they rarely mentioned bilingual education as a means to that end.

There is also a compelling case that more *laissez-faire* Estonian policies regarding local language requirements in Estonian Russian medium schools did not produce similar 'unintended' effects on achievement gains for Russian medium students. However, later efforts by the Estonian government to convince Russian medium school principals to adopt Estonian curricula and teaching methods in the context of improving Estonia's PISA performance did appear to impact Russian students' PISA scores as Russian medium school principals gradually bought into 'modern' ideas about effective education. Such efforts represent a successful attempt to produce 'intended' effects on Russian medium students as a particular and new form of compensatory legitimation. This new form is directly linked to student achievement outcomes, where higher student achievement on international tests in and of itself implies greater state effectiveness, hence legitimacy (OECD, 2014). The new form is also part of a much larger effort by the state to push for better performance on the PISA by

all students through more closely tying curriculum and evaluation at the school to the type of knowledge tested by the PISA.

The education of Russian students in Russia was also subject to compensatory legitimation reforms in this period, but based on a review of these reforms and interviews with policy makers, principals and teachers in Russian schools, curriculum and teaching changes have been very limited compared to those introduced indirectly by language policies in Latvia and more directly to raise student achievement (as measured by PISA) in Estonia. The focus in Russia has been much more on increasing attainment than raising test scores. Yet, the Russians introduced statistics in the curriculum in 2007, and this produced an increase in the 'data' portion of the 2011 TIMSS test. Furthermore, the new Russian national standards introduced in 2014/15 incorporate many of the curricular and teaching reforms we observed in the Baltics. The impact on student achievement of these reforms will probably not be observed for another five or six years, and as we have seen in Latvia and Estonia it will depend on whether principals and teachers incorporate them into their classrooms.

One lesson to learn here is that states enact educational reforms that are consistent with a broader goal of state legitimation, and even if the reforms have little direct relation to raising student achievement outcomes, they may inadvertently improve student learning. A second already well-known lesson is that if the intended effect of the compensatory legitimation reform is to raise student achievement on a particular type of test, the best way to do so is to link instruction to the test. A third lesson, illustrated by the Estonian case (but also potentially applicable to Latvia), is that this linkage is easier to accomplish in a small education system than in a large one, since accepting and implementing instructional reforms school by school is the key to successfully raising test scores.

## Notes

1. The available literature comparing the academic effects of different national reforms on similar students is sparse (Carnoy, Chisholm & Chilisa, 2012; Knight & Sabot, 1990), since such studies require data on school outcomes and comparable student populations.
2. Lithuania also has Russian medium schools, and participated in the TIMSS in all waves, 1995–2011, and in PISA, 2006–2012. However, the PISA test in Lithuania was only in Lithuanian. Russian speakers in Russian medium schools did not take the PISA test in Russian, so we did not include Lithuania in the analysis.
3. Russian medium schools existed in independent Latvia in the inter-war years (1918–1939). To a much lesser extent this was also true in Estonia, where Estonians were almost 90% of the population in 1939. *Russification* policies under Soviet occupation after 1940 greatly increased the Russian population in both countries. Russian emigration from Latvia and Estonia occurred after 1991, but students in Russian medium schools in both countries remain at about one-fourth of the total student population.
4. Including East Germany and the five countries of Yugoslavia, which eventually became seven independent republics.
5. In this sense, the current conflict in Russia between maintaining the 'traditional' system (as reformed in the 1990s and early 2000s) and implementing reforms that respond to the new global ideology corresponds to the current conflict in the USA between maintaining the system as reformed (also in the 1990s and early 2000s) and introducing the Common Core.
6. See <http://conventions.coe.int/Treaty/en/Treaties/Html/157.htm>.

7. The examination on knowledge of the Estonian Constitution and the Citizenship Act, and the Estonian language proficiency examination (pass at a level B1, at minimum). See <https://www.politsei.ee/en/teenused/eesti-kodakondsus/eksamid-kodakondsuse-taotlemiseks.dot> & Citizenship Act <http://www.refworld.org/pdfid/4933ce4e2.pdf>. However, in Estonia, unlike Latvia, it is possible to communicate with government officials in other languages under certain conditions.
8. Nevertheless, the Estonian government has been insistent in its drive to have teachers in Russian-medium schools become fluent in Estonian in order to meet the 60% mandate (Levy, 2010). A shortage of Latvian-speaking teachers in Russian-medium schools in Latvia has also been a problem in the implementation of Latvian language curriculum requirements (Ivlevs & King, 2014).
9. The TIMSS was applied every four years between 1995 and 2011, testing 4<sup>th</sup> and 8<sup>th</sup> grade students in mathematics and science. TIMSS has been administered in Russia in every wave, but Latvian students took the TIMSS only in 1995, 1999 and 2003, and Estonian students only in 2003. Only Latvian-speaking students took the TIMSS test in 1995 and 1999. Thus, for TIMSS, we only have one year of data, 2003, in which we can compare Russian medium students in the Baltics with local language medium students or with Russian students in Russia, so beyond comparing mean scores in the Baltics with Russian means for 1995, 1999 and 2003, TIMSS results have limited use for our purposes.
10. The variable 'number of books at home' was excluded from the model (1) in that case, but we continued to include mother's education as an SCS variable even in the three separate levels of books in the home models.
11. We use a rough indicator of significant difference between the Russian-Latvia and Estonian-Estonia coefficients where the difference is larger than two standard errors—in this case, twice 0.06 or 0.07.
12. Indeed, the Estonian curricular reforms of the 1990s bore a strong resemblance to reforms in Finland, with a strong emphasis on principal-teacher instructional focus, student engagement, and student evaluation using test instruments developed in the 1990s and quite similar to the later PISA instrument (Logvina, 2014). In Russia, final tests in the 9<sup>th</sup> and 11<sup>th</sup> grades are based on the more traditional 'knowledge-based' approach, which is related to but quite different in style of questions from the PISA competency approach.
13. We observed some middle school science and other classrooms in Estonia and noted the use of PISA-type tasks in these classes. These types of tasks may have preceded the regular participation in PISA tests, but the point is that the Estonian curriculum and teacher training includes teaching such tasks.

## Acknowledgements

The article was prepared within the framework of the Basic Research Program at the National Research University Higher School of Economics (HSE) and supported within the framework of a subsidy granted to the HSE by the Government of the Russian Federation for the implementation of the Global Competitiveness Program.

## Notes on contributors

*Tatiana Khavenson* is a Research Associate at the International Laboratory for Education Policy, Institute of Education, National Research University Higher School of Economics in Moscow.

*Martin Carnoy* is Vida Jacks Professor of Education, Stanford University, USA, and a visiting professor at the National Research University Higher School of Economics. Both have done extensive comparative empirical research on post-Soviet Russian education and educational policy using national and international test results.

## References

- Bowles, S., & Gintis, H. (1976). *Schooling in capitalist America: Educational reform and the contradictions of economic life*. London: Routledge & Kegan Paul.
- Carnoy, M. (2014). Globalization, educational change, and the national state. In N. P. Stromquist & K. Monkman (Eds.), *Globalization and education: Integration and contestation across cultures*. New York, NY: R&L Education.
- Carnoy, M., Chisholm, L., & Chilisa, B. (Eds.). (2012). *The low achievement trap: Comparing schooling in Botswana and South Africa*. Pretoria: Human Sciences Research Council.
- Carnoy, M., Loyalka, P., Dobryakova, M., Dossani, R., Froumin, I., Kuhns, K., Tilak, J. B. G., & Wang, R. (2013). *University expansion in a changing global economy: Triumph of the BRICs?* Stanford: Stanford University Press.
- Carnoy, M., Khavenson, T., & Ivanova, A. (2015). Using TIMSS and PISA results to inform educational policy: A study of Russia and its neighbours. *Compare: A Journal of Comparative and International Education*, 45, 248–271.
- Chudgar, A., Luschei, T., Fagioli, L., & Lee, C. (2012). Socio-economic status (SES) measures using the Trends in International Mathematics and Science Studies (TIMSS) Data. Michigan State University (mimeo).
- Cochran, W. G. (1968). The effectiveness of adjustment by subclassification in removing bias in observational studies. *Biometrics*, 24, 295.
- Erss, M., Mikser, R., Löfström, E., Ugaste, A., Rõuk, V., & Jaani, J. (2014). Teachers' views of curriculum policy: The case of Estonia. *British Journal of Educational Studies*, 62, 393–411.
- European Commission against Racism and Intolerance. (2006). *Third report on Estonia*. Strasbourg.
- European Commission against Racism and Intolerance. (2010). *ECRI report on Estonia (fourth monitoring cycle)*. Strasbourg.
- European Commission against Racism and Intolerance. (2012). *ECRI report on Latvia (fourth monitoring cycle)*. Strasbourg.
- European Commission, Eurydice (2015a). Estonia: National reforms in school education. Retrieved from [https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Estonia:National\\_Reforms\\_in\\_School\\_Education](https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Estonia:National_Reforms_in_School_Education)
- European Commission, Eurydice (2015b). Latvia: Ongoing reforms and policy developments. Retrieved from [https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Latvia:Ongoing\\_Reforms\\_and\\_Policy\\_Developments](https://webgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Latvia:Ongoing_Reforms_and_Policy_Developments)
- Government of Latvia Ministry of Foreign Affairs. (2014a). National/ethnic minority education. Retrieved from <http://www.mfa.gov.lv/en/policy/society-integration/integration-policy-in-latvia-a-multi-faceted-approach/national-ethnic-minority-education>
- Government of Latvia Ministry of Foreign Affairs. (2014b). Why national minority education reform was needed in Latvia. Retrieved from <http://www.mfa.gov.lv/en/policy/society-integration/minority-education-in-latvia/why-national-minority-education-reform-was-needed-in-latvia>
- Habermas, J. (1975). *Legitimation crisis*. Boston, MA: Beacon Press.
- Halpin, D., & Troyna, B. (1995). The politics of education policy borrowing. *Comparative Education*, 31, 303–310.
- Hanushek, E. A., Peterson, P. E., Woessmann, L., & Summers, L. H. (2013). *Endangering prosperity: A global view of the American school*. Washington, DC: Brookings Institution Press.
- Heyneman, S. P. (1998). The transition from party/state to open democracy: The role of education. *International Journal of Educational Development*, 18, 21–40.
- Heyneman, S. P. (2000). From the party state to multiethnic democracy: Education and social cohesion in Europe and Central Asia. *Educational Evaluation and Policy Analysis*, 22, 173–191.
- International Association for the Evaluation of Educational Achievement (IEA) (2015). Trends in Mathematics and Science Survey, Microdata. TIMSS and PIRLS International Study Center. Retrieved from <http://timssandpirls.bc.edu/index.html>
- Ivlevs, A., & King, R. M. (2014). 2004 Minority education reform and pupil performance in Latvia. *Economics of Education Review*, 38, 151–166.

- Khandker, S., Koolwal, B. G., & Samad, H. (2009). *Handbook on impact evaluation: Quantitative methods and practices*. Washington, DC: The World Bank.
- Knight, J. B., & Sabot, R. H. (1990). *Education, productivity, and inequality: The East African natural experiment*. New York, NY: Oxford University Press.
- Leech, N. L., & Onwuegbuzie, A. J. (2009). A typology of mixed methods research designs. *Quality & Quantity*, 43, 265–275.
- Levy, C. J. (2010). Estonia raises its pencils to erase Russian. *The New York Times*. Retrieved from <http://www.nytimes.com/2010/06/08/world/europe/08estonia.html>.
- Logvina, I. (2014). Funktsionaalse kirjaoskuse arendamine ja hindamine koolis teksti lugemisel ja mõistmisel. PISA uuringud: eesti hariduspeegel. Narva, Estonia.
- Morgan, D. L. (2013). *Integrating qualitative and quantitative methods: A pragmatic approach*. New York, NY: SAGE.
- Offe, C. (1976). *Notes on the 'laws of motion' of reformist state policies*. Germany (mimeo): Bielefeld University.
- Organisation for Economic Cooperation and Development (OECD) (2001a). *Reviews of national policies for education: Estonia 2001*. Paris: OECD Publishing. Retrieved from [http://www.keepeek.com/Digital-Asset-Management/oced/education/reviews-of-national-policies-for-education-estonia-2001\\_9789264189966-en#page5](http://www.keepeek.com/Digital-Asset-Management/oced/education/reviews-of-national-policies-for-education-estonia-2001_9789264189966-en#page5)
- Organisation for Economic Cooperation and Development (OECD) (2001b). *Reviews of national policies for education: Latvia 2001*. Paris: OECD Publishing. Retrieved from [http://www.keepeek.com/Digital-Asset-Management/oced/education/reviews-of-national-policies-for-education-latvia-2001\\_9789264192478-en#page1](http://www.keepeek.com/Digital-Asset-Management/oced/education/reviews-of-national-policies-for-education-latvia-2001_9789264192478-en#page1)
- Organisation for Economic Cooperation and Development (OECD) (2014). *PISA 2012 results: What students know and can do—Student performance in mathematics, reading and science (Volume I revised ed.)*. Paris: OECD Publishing.
- Park, J. (2006). Integration of peoples and minorities: An approach to the conceptual problem of peoples and minorities with reference to self-determination under international law. *International Journal on Minority and Group Rights*, 13, 69–93.
- Phillips, D. (2006). Investigating policy attraction in education. *Oxford Review of Education*, 32, 551–559.
- Raun, T. U. (2009). Estonia after 1991: Identity and integration. *East European Politics & Societies*, 23, 526–534.
- Republic of Latvia, Education Law of 1998 (n.d.). Retrieved from [http://www.minelres.lv/NationalLegislation/Latvia/Latvia\\_Education\\_English.htm](http://www.minelres.lv/NationalLegislation/Latvia/Latvia_Education_English.htm)
- Riigi Teataja. (2010). *Estonian basic schools and upper secondary schools act*. Retrieved from <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/508012015002/consolide>
- Siiner, M. (2014). Decentralisation and language policy: Local municipalities' role in language education policies. Insights from Denmark and Estonia. *Journal of Multilingual and Multicultural Development*, 35, 603–617.
- Silova, I. (2002). The manipulated consensus: Globalisation, local agency, and cultural legacies in post-Soviet education reform. *European Educational Research Journal*, 1, 308–330.
- Silova, I. (2004). Adopting the language of the new allies. In G. Steiner-Khamsi (Ed.), *The global politics of educational borrowing* (pp. 75–87). New York, NY: Teachers College Press.
- Silova, I. (2006). *From sites of occupation to symbols of multiculturalism: Reconceptualizing minority education in post-Soviet Latvia*. New York, NY: Information Age Publishing.
- Silova, I., Johnson, M. S., & Heyneman, S. P. (2007). Education and the crisis of social cohesion in Azerbaijan and Central Asia. *Comparative Education Review*, 51, 159–180.
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75, 417–453.
- Spreen, C. A. (2004). Appropriating borrowed policies: Outcomes-based education in South Africa. In G. Steiner-Khamsi (Ed.), *The global politics of educational borrowing* (pp. 101–113). New York, NY: Teachers College Press.
- Staklis, S. M. (2005). *Higher education and ethnicity in the Republic of Latvia*. Unpublished PhD dissertation, Graduate School of Education, Stanford University.

- Steiner-Khamsi, G. (2006). The economics of policy borrowing and lending: A study of late adopters. *Oxford Review of Education*, 32, 665–678.
- Teddlie, C., & Tashakkori, A. (2006). A general typology of research designs featuring mixed methods. *Research in the Schools*, 13, 12–28.
- Weiler, H. N. (1983). Legalization, expertise, and participation: Strategies of compensatory legitimation in educational policy. *Comparative Education Review*, 27, 259–277.
- White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, 91, 461.
- White, S. B., Reynolds, P. D., Thomas, M. M., & Gitzlaff, N. J. (1993). Socioeconomic status and achievement revisited. *Urban Education*, 28, 328–343.