Socio-Economic and Gender Inequalities in Educational Trajectories upon Completion of Lower Secondary Education in Russia

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Abstract. Using longitudinal data based on the panel study *Trajectories in Education and Career* (TREC), we analyse the probabilities of entering 10th grade for boys and girls as well as for students with different socio-economic backgrounds. In 2012, 59% of pupils chose the academic track and continued their education in 10th grade upon completion of 9th grade, while others moved to vocational education. Girls are more likely to enter the academic track then boys. The probability of entering the academic track is considerably higher for students from more educated and wealthier families. We analyse total inequality in the educational transition as a sum of primary and secondary effects where primary effects refer to inequalities in performance and secondary effects refer to inequalities in making the transition while controlling for performance. We find strong secondary effects of parental education and wealth on making a transition to the academic track. There is no evidence of secondary effects of gender. The paper discusses mechanisms of gender and socio-economic inequalities in the transition to 10th grade and makes policy recommendations aimed at reducing social inequality in education.

Keywords: gender inequality, social inequality in education, educational transition, primary and secondary effects, longitudinal study.

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The transition Russian school students make after 9th grade is the first "fork" that largely determines subsequent educational trajectory. After middle school, students are free to choose between high school (grades 10 and 11) and vocational education (trade schools, lyceums, technical colleges). Opting for high school is the most popular way of getting higher education ("academic track"), which provides for a tan-

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gible competitive edge in the labor market. Students who move to 10th grade will likely, although not always, enter a university and obtain a higher education. Conversely, the transition to initial and secondary vocational schools ("nonacademic track")[1] implies learning trades that do not require a higher education. Traditionally, initial vocational education institutions have supplied industrial workers since the Soviet era, and this pattern is still partly preserved. The most widespread trades in secondary vocational education include accountant, cashier, nurse, preschool teacher, elementary school teacher, machinist, driver, fitter, and mechanic [Education in the Russian Federation, 2014].

Some trade school, lyceum, or technical college graduates also may receive a higher education: according to official statistics, 35% of secondary vocational school graduates continued their education in universities in 2008 [Shugal, 2010]. Meanwhile, high school concentrates the most capable students (as we will see below), performing much better than those who choose the nonacademic track. Students who opt for 10th grade enter the most selective, prestigious, and high-quality universities in the future.

Therefore, the academic track provides students with considerable advantages in terms of further education and employment.

This paper seeks to analyze social and gender inequality in the educational transition to 10th grade. The process is far from universal: a selection takes place, which always creates conditions for inequality. As we will show below, this is exactly the case, and there is both gender inequality and inequality based on family social background.

First, we examine the national statistics on changes to the number and proportion of students going to the tenth grade over the last 20 years. Next, we give a short description of educational inequality research methods used in the sociology of education and analyze studies on educational inequality in Russia. Then, we raise research questions, provide an empirical basis (the panel study *Trajectories in Education and Career*), and describe the statistical methods we apply for data analysis. Afterwards, we present the results of this analysis. The paper ends with discussing the results in light of educational inequality theories and Russian education policies.

1. Educational Transition after 9th Grade According to National Statistics

We first examine the dynamics of 10th grade enrollment over the last 20 years according to official statistics. Figure 1 shows the dynamics of the number of students who moved from 9th grade to 10th grade. The sharp decline in the number of students between 2003 and 2009 is due to the baby bust of the late 1980s—early 1990s. In 2013 about 1,200,000 students finished 9th grade, of which 670,000 moved to 10th

[1] The new Law On Education that was adopted in 2012 abolishes initial vocational education, making it part of secondary vocational education as "worker and employee training programs".

grade, as compared to 2,100,000 and 1,400,000 in 2000, respectively. The age cohort shrank nearly twice in thirteen years. The birth rate in Russia was at its lowest in 1999, and teenagers of the resulting cohort finished 9th grade in 2013. It has been increasing since 2000, so the number of 9th-graders will only be growing in the years to come. However, growth will be slow, and the cohort will not reach the level of 2000 within the next 14 years.

Figure 2 demonstrates the proportion of 9th grade graduates who progressed to 10th grade, both for Russia as a whole and broken down by urban and rural schools. About 67% of students moved from 9th to 10th grade in the 2000–2001 academic year. From then on, the proportion decreased to 57% in 2013, with the absolute number of students who continued their education in 10th grade hitting its low for the whole post-Soviet history. The decline is particularly noticeable in 2007–2009. The factors of these dynamics are yet to be investigated, but they must have included the introduction of the Unified State Exam (USE), which probably encouraged some students and their parents to use the opportunity to enter a university with no examinations after obtaining secondary vocational education.

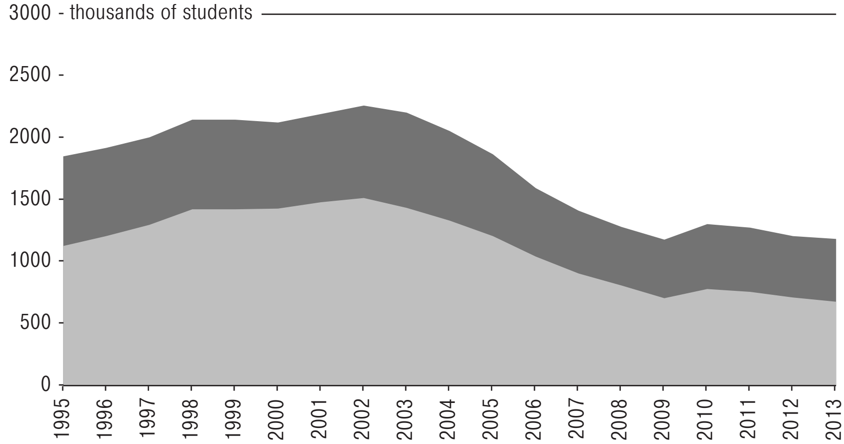
As it follows from Figure 2, the proportion of students progressing to 10th grade reduced more dramatically in rural schools than in the city. The values were pretty much the same in 1999; the gap appeared in 2000 and grew continuously to reach over 10% in 2013. Apparently, this dramatic decline is related to the rural school restructuring process that was launched in 2001. The reform was designed, inter alia, to reconfigure complete secondary education institutions into those of basic (elementary + middle) general education, i.e. to transform eleven-year schools into nine-year schools[2]. As a result, rural students opted for secondary vocational education or entered 10th grade in nearby towns.

2. Social Inequality in Education: A Short Overview of Theories and Studies

Social differences in educational outcomes are a hot-button issue in the sociology of education. They exist between genders, social classes and ethnic groups and may manifest themselves in the level of performance, examination scores and the probability of transition at different stages of the educational path. We will address gender and class differences below, leaving the ethnic aspect beyond the scope of this article.

2 See the Resolution of the Government of the Russian Federation No. 871 "On Restructuring Rural General Education Institutions" from 17 December 2001: http://bazazakonov.ru/doc/?ID=1393596; for an overview of the reform concept, see the website of Uchitelskaya gazeta: http://www.ug.ru/old/02.51/t21.htm.

Figure 1. **9th grade graduation and 10th grade enrollment, 1995–2013***

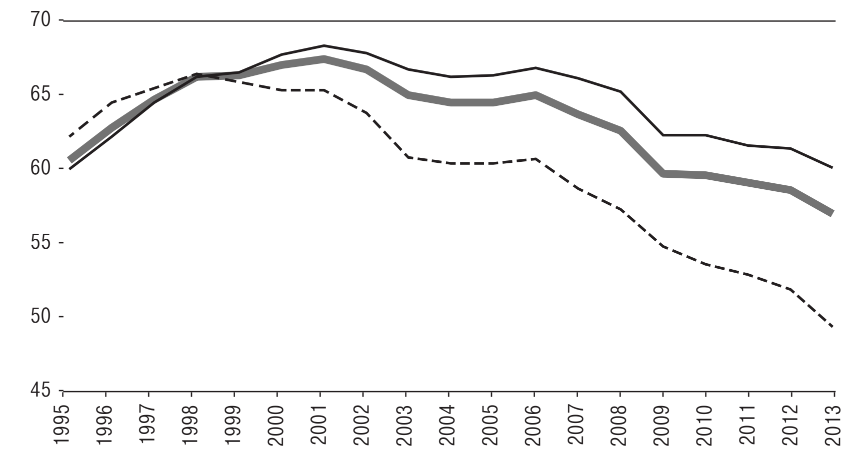


Middle school graduates
Enrolled in 10th grade

* The data on 9th grade graduates only covers state and municipal schools.

Source: Education in the Russian Federation 2006; 2010; 2012; 2014: Statistical compendia (Moscow: NRU HSE).

Figure 2. **The proportion of 9th grade graduates enrolled in 10th grade**



Total
Urban
Rural

Source: Education in the Russian Federation 2006; 2010; 2012; 2014: Statistical compendia (Moscow: NRU HSE).

2.1. Gender differences in educational outcomes

In the past, the number of male students used to exceed that of female students at virtually all stages of education. Education, particularly higher education, was practically inaccessible for women in most developed countries up to the 19th century. The situation began to change in the 20th century, most noticeably from the 1960s, and today girls perform better on average in education than boys nearly in all countries [Buchmann, DiPrete, MacDaniel, 2008]. Girls in the US, UK, and most other countries enter universities more often than boys [DiPrete, Buchmann, 2013]; they have higher academic achievements in school and less disciplinary problems. The results of national and international tests demonstrate that girls on average perform much better in reading tests and succeed in mathematics equally to boys in most cases (although the proportion of boys among the top performers in mathematics is higher) [Halpern et al., 2007; Lindberg et al., 2010; Bessudnov, Makarov, 2015]. As a result, the male dominance in education was replaced by a slight though obvious dominance of women almost everywhere. The growing superiority of women in their twenties and thirties in terms of higher education and access to relevant occupations will certainly entail further changes to gender roles and gender inequality in the labor market.

For the purposes of this article, we will primarily focus on gender differences in educational outcomes in school. Why do girls perform on average better than boys? Several possible reasons are identified in an expert overview of studies on gender inequality in education [Buchmann, DiPrete, MacDaniel, 2008]. First, there may be biologically induced differences in both cognitive and non-cognitive abilities between men and women. The majority of studies show that the cognitive skills of men and women differ very little, if at all. However, academic achievement also requires non-cognitive skills, such as motivation, self-control, persistence, etc. [Gutman, Schoon, 2013]. These qualities are not necessarily pre-determined biologically, but the differences in hormonal development of boys and girls may play a part. Non-cognitive factors should be taken into account when analyzing gender differences in academic performance, which is proved by the fact that the female dominance over boys in grades is usually more significant than the differences in standardized test scores.

Second, gender stereotypes and attitudes affecting the perception of school and learning play a great role. On average, girls are less likely to display negativity towards school and teachers, while boys, in particular those from poorer and less educated families, may consider diligence in learning inappropriate and conflicting with the values and attitudes accepted in their community. Boys who take studies too seriously risk being stigmatized (for example as “nerds”) and lose the respect of an influential group of peers [Legewie, DiPrete, 2012; DiPrete, Buchmann, 2013]. The desire to avoid damage to one’s status or reputation reduces the motivation for learning.

Third, gender differences in educational outcomes in school may be generated by parents who treat the education of boys and girls differently and thus guide them towards different educational and career trajectories. Finally, one cannot ignore the interaction of students with schoolteachers, most of whom are women. A series of studies have been conducted to examine the influence of teacher gender on differences in performance between boys and girls, though their results are ambiguous. One of them revealed no correlation between teacher gender and gender differences among students, while others produced evidence of higher performance among girls educated by female teachers (see the overview in [Buchmann, DiPrete, MacDaniel, 2008]).

2.2. Socioeconomic aspects of inequality in educational outcomes

Children from well-educated and affluent families perform better in school and obtain higher education more often. The criteria for discriminating between social backgrounds are not our fundamental concern in this study. It may be parental occupation (in terms of which social class is most often operationalized in sociology), parental education, or family income—results will be more or less the same anyway. Russian researchers of social inequality in education rely first of all upon works by Pierre Bourdieu [Bourdieu, Passeron, 1970], but there is also an extensive Anglo-American tradition of empirical studies in this field going back to the Coleman Report [Coleman et al., 1966]. A large-scale survey of over 600,000 people, carried out under the guidance of the famous American sociologist James Coleman, described the correlation between socioeconomic status and student achievement.

There is an extensive body of literature on socioeconomic inequality in education (for an overview of quantitative research from 1990 to 2005, see [Breen, Jonsson, 2005]), so we will only touch upon the key issues and theories here. As with gender, socioeconomic inequality in education may be analyzed from the perspective of student performance and from that of the probability of transition at different stages in education.

Fundamental changes to the education system occurred in the 20th century, with the massification of secondary education. A question was raised: how is the correlation between family background and the education tier changing as the latter becomes more accessible? An analysis of data on four age cohorts in Ireland produced a theory of maximally maintained inequality (MMI), which describes a transfer of inequality in education from lower to higher tiers [Raftery, Hout, 1993]. According to this theory, when a particular stage of education becomes accessible to all, the effects of social background diminish at this stage. With the expansion of secondary education, for instance, social background does not really affect the completion of secondary education anymore, but becomes an important factor in obtaining a higher education. In other words, when school education becomes accessible to all, social inequality is forced out to the next stage in education.

Of course, inequality may apply not only to a stage in education but also to education quality. It is not only the completion of school education in and of itself that matters, but also the type of school, the quality of teaching, the social composition of the student body, etc. The theory of effectively maintained inequality takes into account not only transitions between stages of education, but also qualitative differences in curriculum at universally accessible levels [Lucas, 2001]. Privileged families use various ways of making their children more advantaged. If the education tier is not generally accessible, privileged classes will use their resources to get their kids to that level. If, however, the level is easily available to all, the resources will be invested to provide a higher quality of education at that level.

Richard Breen and John H. Goldthorpe approach educational decisions made by students and their families from a rational choice perspective [Breen, Goldthorpe, 1997]. According to their model, parents and children consider the following factors before making educational decisions: first, the cost of educational transition, including the cost of education and lost earnings; second, the chances for success in the next tier, represented by the likelihood of passing final examinations, for example; third, the value and importance of a particular tier of education for the family and the student. The model represents students and their parents as rational actors choosing between available educational options based on their assessment of costs and benefits.

Why do children from more socially advantaged families show better academic performance on average? Education researchers allow for several possible reasons. To avoid dwelling on their tenability, we will just specify them as they are classified in the relevant literature [Jackson, 2013; Erikson, Jonsson, 1996]. First, the difference between children may be explained by cognitive and non-cognitive characteristics inherited from parents. Ample human behavioral genetics research from recent decades makes clear that many of cognitive and non-cognitive skills are largely inherited genetically [Plomin et al., 2013]. More educated parents with higher cognitive abilities will likely have more capable children. However, many sociologists do not recognize the role of genetic factors in explaining social inequality in educational outcomes. Meanwhile, genetics contend that even if inherited qualities contribute to inequality, they do not provide an ultimate explanation and leave space for other reasons.

Second, a significant role is played by the financial, cultural, and social family resources available to children (parental influence, social environment, access to books and other education resources, understanding the importance of education). Third, children in more educated and affluent families have better food, which makes them on average healthier. Fourth, teachers and schools may favor children from advantaged families directly or indirectly due to the linguistic and cultural practices they manifest, even if such practices are not directly associated with the learning process. Finally, psychological patterns matter. Children from less educated families may have less confidence in their abilities even if there are no obvious reasons for this. (For a more detailed analysis of these mechanisms and references to relevant literature, see [Jackson, 2013])

Obviously, social inequality in academic performance is closely related to the probability of making educational transitions. Better performing students are more likely to move to the next stage in education, whether from 9th to 10th grade or from high school to higher education. If children from families that are more socially privileged perform better, then they will more likely enter a university and obtain a higher education. Yet is it performance only that explains the difference between social classes in the probability of achieving a higher level of education?

The correlation between academic performance and educational transition is better conceptualized if we discriminate between the primary and secondary effects of social background on educational trajectories. In the 1970s Raymond Boudon was the first to analyze the reproduction of social inequality in education as two interrelated but conceptually different processes [Boudon, 1974]. First, social background determines educational outcomes, for example in the form of academic performance. We gave a brief overview of this mechanism above. Boudon describes this correlation as the primary effects of social stratification on educational attainment. Second, with performance held equal, social background may affect educational decision-making. Students from more affluent and/or educated families may be more likely to continue schooling than their peers from less advantaged families, even if their capabilities and educational achievements are more or less the same. Boudon refers to this phenomenon as the secondary effects of social stratification on educational attainment. Secondary effects apply when students and their parents choose an educational trajectory. This choice is determined by preferences as to the desired level of education, costs associated with transition to a higher level, and policies enforced by education institutions and other players in the education market.

Boudon's theory was "remarkably disregarded" [Jackson et al., 2007. P. 212] for a long time, but more and more empirical studies on inequality in education have been discriminating between primary and secondary effects lately. A statistical method was developed, allowing for the identification of primary and secondary effects of social inequality in educational transitions [Erikson et al., 2005]. A recent comparative study using this method analyzes primary and secondary effects in educational transition to different levels for the US and several European countries [Jackson, 2013]. Secondary effects appear to have a tangible impact on educational decisions in all countries, just as primary effects do. The primary and secondary effects approach can also be used to explore gender and ethnic inequality in education (see, for instance, [Jackson, Jonsson, Rudolphi, 2012]).

Based on a retrospective survey conducted in 1991, Theodore P. Gerber and Michael Hout proved there had been considerable social class inequality in access to education in the USSR, despite the proclaimed ideology of total equality [Gerber, Hout, 1995]. As in other countries, men originally dominated women in educational transitions (notably those to higher education), but their dominance had faded away by the 1960s—1970s. In the 1990s, social inequality increased for transitions from 9th to 10th grade, but remained the same for transitions from high school to university [Gerber, 2000].

Soviet researchers began investigating educational and career trajectories of young people in the 1960s [Shubkin, 1970]. A longitudinal study was performed in Novosibirsk Oblast in 1998–2008, its samples including graduates from high school, secondary, and initial vocational education institutions [Konstantinovskiy et al., 2011; Cherednichenko, 2014]. Three waves of research collected information on the social background of respondents, their educational and career plans, and actual educational trajectories. It was established that the type of education already received (high school, secondary, or initial vocational education) largely affects subsequent educational and career trajectories. Graduates from initial vocational training schools get blue-collar jobs and have little career advancement opportunities. Graduates from secondary vocational training schools fall into two groups of approximately equal size: some opt for higher education, while others get employed as workers, engineers, or technologists, but often have to change their occupation later. Completion of high school provides more successful educational and career trajectories, as it is traditionally associated with university education [Cherednichenko, 2014]. Although the study did not cover transitions from 9th to 10th grade, the results obtained are a gauge of socioeconomic inequality in student distribution. Students of secondary and particularly initial vocational training schools mostly come from families with low educational resources. The lower the social and occupational status, the more likely a student will opt for a trade school [Konstantinovskiy et al., 2011].

A comprehensive analysis of the first educational transition (i. e. the choice of trajectory after 9th grade) requires data to be collected before and after such transition. Regional longitudinal studies initiated as part of the panel study *Trajectories in Education and Career (T*REC*)* and conducted by the Higher School of Economics in Yaroslavl Oblast and Tatarstan revealed that family educational resources (and parental occupational status to a lesser extent) predetermine the educational plans of 9th grade graduates. The higher the educational, social, and occupational status of parents, the more likely their children will choose the academic track by progressing to 10th grade. Also, children from less educated families feel more uncertain about their future educational trajectories [Popov, Tyumeneva, Kuzmina, 2012].

The second wave of the study of school students in Yaroslavl Oblast and Tatarstan allowed researchers to analyze how the family background and personal characteristics of students (educational attainment, intentions to pursue education, and ambition) correlate with their actual educational trajectories after 9th grade [Ibid.]. Expectedly, young people from low-educated families are more likely to go to initial or secondary vocational education institutions after 9th grade. Personal educational achievements and intentions concerning further education mediate family effects and may weaken or strengthen them (for example, well-performing students from less educated families tend to progress to 10th grade). No gender differences in family effects on educational decisions were revealed.

Transition from 9th grade to a secondary vocational education institution and then to a university as a special educational strategy became the subject of research based on a survey among 9th graders in St. Petersburg, Leningrad Oblast, and Moscow Oblast and secondary vocational education students in St. Petersburg [Alexandrov, Tenisheva, Savelyeva, 2015]. The strategy is quite popular among 9th grade graduates, as they can learn a trade and enter the labor market much earlier. Besides, it also makes higher education more accessible, serving as a safety cushion in case of failure. Introduction of the USE produced another motivation for choosing this educational trajectory: the risk of failing the exam and not receiving a high school diploma. Researchers are convinced that this strategy is typical of average performers, usually from general-purpose schools. Their families have limited resources and a lower social status than those who opt for the academic track, yet a higher status than those who plan on entering the labor market after obtaining a secondary vocational education. Parents of such students often have an initial or secondary vocational education, and they are less familiar with how the higher education system works. The authors come to a conclusion that families choosing this educational strategy try to improve their social status.

3. Research Questions

This paper seeks to explore the inequality in transition from 9th to 10th grade between boys and girls and between students from families with different socioeconomic resources. The logic of the research is as follows. First, we determine the difference in probabilities of making an educational transition between the relevant groups based on the panel study results. Following the international tradition described above, this difference may be illustrated as the sum of primary and secondary effects.

We define primary effects as the differences in academic performance between the groups. For instance, girls on average perform better than boys, and children from more educated families often have higher academic achievements than those from lightly educated families. Secondary effects are understood as the differences in probability of making an educational transition between students from different groups showing similar academic performance. For example, if we take a group of boys and a group of girls who finished 9th grade with similar achievements, will there be a difference in the probability of their progress to 10th grade? If there is any disparity, it cannot be explained by inequality in academic achievement. In this case, we are talking about an educational choice that is made regardless of previous attainment. The same logic applies to socioeconomic inequality research but in terms of families with different levels of education or income. Therefore, the second objective of this study is to explore the secondary effects of gender and socioeconomic family status as factors influencing the probability of making a transition to high school.

We do not intend to divide the overall gender of social inequality in the probability of making an educational transition into primary and secondary effects to compare the proportions. Some new statistical methods have been developed over the last decade to tackle this issue, which is certainly of great interest. However, it is technically sophisticated, and going into it might distract us from the main problem. Instead, we describe the cumulative inequality between the groups (the sum of primary and secondary effects) and then determine if there are any secondary effects.

In other words, the article answers the following questions. Are there any differences in the probability of progressing to 10th grade between boys and girls and between children from more and less educated or advantaged families? If there are any, will they persist after we allow for the differences in academic performance and test scores between the groups?

4. Data and Methods

The empirical basis is represented by the national TREC study, which has been conducted since 2011 by the HSE Institute of Education [Bessudnov et al., 2014; Kurakin, 2014]. The sample of this longitudinal study was selected in 2011 for the Trends in International Mathematics and Science Study (TIMSS) and included boys and girls who were 8th graders during the 2010–2011 academic year. Regions were selected at the first stage and schools at the second stage to provide a representative sample[3]. All in all, the questionnaires and tests covered 4,893 students from 210 schools in 42 regions of the Russian Federation. The study assessed the mathematical and science competencies of 8th graders and surveyed students, their teachers, and school administrators.

The school students engaged in that study formed the original sample of the HSE longitudinal study. The first wave took place in 2012 and surveyed participants of TIMSS2011 (3,377 9th graders) and their parents. Part of the respondents were not surveyed because some schools or parents did not agree to participate or due to certain organizational issues. The same students were covered by the Programme for International Student Assessment (PISA) as a duplicate sample in spring 2012. Thus, a unique panel was formed to use the data of two different international testing systems.

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3 The sample was prepared by the Education Quality Assessment Center of the Institute for Strategy of Education Development, Russian Academy of Education, and approved by the TIMSS International Study Center, Boston College, USA. A detailed description of the sample is available in TIMSS2011 Characteristics of National Samples: http://timssandpirls.bc.edu/methods/pdf/T11_Characteristics.pdf

The second wave of longitudinal research was conducted in Fall 2013. By then, the respondents had already finished 9th grade and gone on to the next level of education. Some of them continued in the same school or another school, others became students of initial or secondary education institutions. In order to cover as many 9th grade graduates as possible and find out about their current place of studies, we collected information on their further educational trajectories from each school. Afterwards, we followed up by surveying students.

Our analytical sample includes respondents with data from all waves of research (the first and second waves of the longitudinal study, TIMSS and PISA), which is 3,268 students, or 67% of the original TIMSS sample. To adjust for possible dropout-related offsets in statistical assessments, we use weight coefficients created as described in [Bessudnov et al., 2014].

The place of study after 9th grade is the dependent variable in our statistical analysis (based on the results of the second wave survey). We treat this variable as dichotomous: it takes on a value "1" if a student progressed to 10th grade (either in the same school or another day school) and "0" if a student chose any other educational trajectory (initial or secondary vocational education, evening high school, no further education at all). The independent variables include gender, parental education and family income (from the first wave parent survey), region, 8th grade final scores in mathematics, Russian, and other subjects (from the first wave student survey), State Final Examination (SFE) points in mathematics and Russian (based on the second wave data), and PISA and TIMSS scores in mathematics, reading, and science. The descriptive statistics for the key data is given in Table 1. It presents sampled mean values or proportions and the 95% confidence interval to show the dispersion of the most probable values for the general population, i. e. all Russian 9th graders.

Below we describe the logic of statistical analysis for assessment of gender inequality in the probability of educational transition. The same logic applies to the analysis of socioeconomic inequality.

At the first stage, we compare the proportions of girls and boys who progressed to 10th grade. This simple analysis allows us to answer the first question raised in this research. To answer the second one, we compare the probabilities of transition to 10th grade between boys and girls, while statistically controlling the effects of academic performance and test scores. We use linear regression, which is the basic statistical analysis method applied in social sciences. The dependent variable is dichotomous, and most statistical analysis textbooks recommend using logistic of probit regression in cases like this. However, using ordinary linear regression for dichotomous dependent variables is not a mistake under certain circumstances. This method is known in econometrics as linear probability model [Wooldridge, 2010. P. 454–457], and it is also used by some sociologists [Mood, 2010]. Despite a number of restrictions, the method has a distinct advantage of sim-

Table 1. **Empirical basis of research**

	Complete sample, 3,268 students	Academic track (10th grade), 1,960 students	Nonacademic track (vocational/trade schools), 1,308 students
	Proportion or mean value [95% confidence interval]		
Gender			
Boys	50% [48; 52]	47% [43; 50]	55% [52; 59]
Girls	50% [48; 52]	53% [50; 57]	46% [41; 48]
8th grade final scores in Russian			
2	< 1% [0; 0.1]	0%	< 1% [0; 0.1]
3	44% [41; 47]	27% [25; 30]	66% [63; 70]
4	43% [40; 45]	56% [53; 58]	26% [23; 29]
5	9% [8; 11]	14% [12; 17]	3% [2; 5]
N/A	4% [3; 5]	3% [2; 4]	5% [3; 6]
8th grade final scores in algebra			
2	< 1% [0; 0.1]	0%	< 1% [0; 0.1]
3	47% [44; 50]	29% [27; 33]	71% [67; 74]
4	39% [36; 41]	51% [48; 55]	22% [19; 25]
5	11% [9; 12]	17% [14; 19]	3% [2; 5]
N/A	4% [3; 5]	3% [2; 4]	5% [3; 6]
Average PISA score			
in mathematics	488 [480; 497]	520 [511; 529]	446 [438; 455]
in science	487 [479; 495]	514 [506; 523]	451 [443; 458]
in reading	469 [460; 477]	501 [492; 510]	426 [418; 434]
Average TIMSS score			
in mathematics	538 [530; 546]	566 [559; 574]	500 [490; 509]
in science	541 [534; 548]	565 [559; 572]	509 [500; 518]
Parental education			
Both parents have higher education	14% [12; 18]	21% [18; 25]	4% [3; 6]
Parent 1: higher education Parent 2: no higher education/N/A	26% [24; 28]	31% [29; 34]	18% [16; 21]
Both parents have no higher education	38% [35; 41]	31% [27; 35]	47% [43; 51]
Parent 1: higher education Parent 2: N/A	19% [17; 21]	13% [11; 15]	27% [23; 31]
N/A	3% [2; 5]	3% [2; 6]	3% [2; 5]

	Complete sample, 3,268 students	Academic track (10th grade), 1,960 students	Nonacademic track (vocational/trade schools), 1,308 students
	Proportion or mean value [95% confidence interval]		
Family income			
below 20,000 rubles/month	40% [36; 44]	33% [28; 37]	50% [45; 55]
20,000–29,000 rubles/month	24% [22; 26]	23% [20; 26]	25% [22; 29]
30,000–49,000 rubles/month	18% [16; 20]	21% [19; 24]	13% [11; 16]
50,000–79,000 rubles/month	7% [5; 9]	9% [7; 12]	4% [3; 6]
> 80,000 rubles/month	4% [3; 5]	5% [3; 8]	2% [1; 3]
N/A	8% [6; 10]	9% [7; 12]	6% [4; 8]

Note. All proportions and mean values were calculated with allowances made for weight coefficients.

plicity of regression coefficient interpretation. We chose it to simplify the presentation of the results and avoid the unnecessary technical complications inevitably entailed by nonlinear models.

For each of the three variables (gender, parental education, family income), we provide four regression models (five for the "family income" variable). The dependent variable is dichotomous in all models, taking on a value of "1" if a student chose high school and "0" if they did not. The independent variable in model 1 is either gender, or parental education, or family income. We also statistically control the regions of schools. Thus, model 1 reflects the difference in probability of transition to 10th grade between students of different genders and from families with different socioeconomic status. Model 2 additionally controls 8th grade SFE scores in algebra, geometry, Russian language, literature, history, physics, chemistry, and biology. These scores provide a cumulative assessment of student attainment. Therefore, model 2 answers the question if there is a difference in the probability of transition to high school between *similarly performing* students of different genders and from families with different socioeconomic status. Model 3 controls TIMSS scores in mathematics and science and PISA scores in mathematics, science, and reading, instead of academic achievements. Students do not know their test scores, so the latter cannot affect their educational decisions. Model 3 answers the question if the difference in probability of educational transition is preserved between groups with similar TIMSS and PISA scores, which assess the general education level of students. Finally, model 4 controls for both academic performance and test scores.

5. Analysis Results

In our sample, 57% of students progressed to 10th grade (95% confidence interval (CI): 55–59%): 50% remained in the same school, and 7% changed their school. 43% opted for another educational path (95% CI: 41–45%), mostly secondary (33%) and initial (6%) vocational education. 3% of respondents reported to have no current enrollment, and 1% were going to evening high schools. According to official statistics, 59% of 9th grade graduates were enrolled in 10th grade in 2012. This falls within the confidence interval of the survey value and confirms the quality of our sample.

Quite predictably, students choosing the academic track have higher achievements and knowledge than those who opt for trade schools and colleges (see Table 1). Among vocational school students, 66% had Cs in Russian and 71% had Cs in algebra in 8th grade. Among 10th graders, the proportions of Cs in Russian and algebra are 27% and 29%, respectively.

We can also compare PISA and TIMSS scores in the two groups. Due to some specific features of the tests—TIMSS is closer to the Russian school program—Russian students scored much better in TIMSS than in PISA. The 2012 average scores in mathematics in OECD countries were 494 for PISA [OECD, 2014] and 500 for TIMSS (due to a different scale) [Mullis et al., 2012]. TIMSS scores of Russian school students are substantially higher than average (538 in mathematics and 541 in science). PISA scores are lower: 488 in mathematics, 487 in science, and 469 in reading. Both tests revealed considerable differences between students choosing the academic and nonacademic track. Thus, the average TIMSS score in mathematics among 10th graders was 566, which approaches the average score in Japan, while students who opted for vocational education scored 500 on average, which is more comparable to Italy. PISA scores in reading look less optimistic: the group of students who progressed to 10th grade showed results close to those in Norway and the UK (501), while students who entered vocational schools scored comparably to the average scores in Mexico and Montenegro (426). However, one should not forget that scores of children from different social classes also differ in those countries.

5.1. Gender

61% of girls and 53% of boys continued education in 10th grade. The difference between the two groups is statistically significant at the 99% level, meaning that girls stay in school much more often than boys and are much less likely to choose vocational education. Table 2 represents four regression models to analyze the difference in probability of transition to high school between boys and girls.

In fact, model 1 echoes the results of comparing the proportions of boys and girls who progressed to 10th grade (with the only difference being that that model 1 statistically controls the regions of schools). The 0.09 regression coefficient means that the probability of transition to high school is higher by 9% for girls than for boys. The coefficient is statistically significant at the 99% level. Thus, chances are extremely

Table 2**. Results of gender regression analysis**

Variable	Model 1 (base)	Model 2 (control for academic performance)	Model 3 (control for PISA and TIMSS scores)	Model 4 (control for all factors)
	Coefficient [95% CI]			
Gender (0 for male, 1 for female)	0.09*** [0.05; 0.13]	−0.03 [−0.07; 0.01]	0.06*** [0.02; 0.10]	−0.02 [−0.06; 0.02]
n (number of students)	3,268	3,268	3,268	3,268

Note. Linear probability models. The dependent variable is a dichotomous variable indicating progression to 10th grade of day school. All models allow for weight coefficients and clusterization of students at the school level. All models control for the region of a school. Model 2 also controls SFE scores in mathematics and Russian, as well as year-end final grades in algebra, geometry, Russian, literature, history, physics, chemistry, and biology. Model 3 controls TIMSS scores (in mathematics and science) and PISA scores (in mathematics, science, and reading). Model 4 includes all predictors of models 2 and 3. Because PISA and TIMSS scores are represented as five plausible values, we use an iterative algorithm to assess models 3 and 4 the way it is used in the pv module for Stata [Macdonald 2014]; the module was reprogrammed so models could include five variables with plausible values. *** p<0.01, ** p<0.05, * p<0.1.

low that the sample would show such result randomly and there is actually no difference between boys and girls in the total population. The 95% confidence interval for the coefficient is [0.05; 0.13], meaning that we can be 95% sure that the real difference between boys and girls in the total population is somewhere between 5% and 13%.

Model 2 additionally controls academic performance. Unlike in model 1, the regression coefficient shifts and becomes statistically insignificant. Therefore, if we compare boys and girls with similar academic achievements and SFE scores, on average the difference in probability of their transition to high school will be nearing zero.

How do we explain the difference between the results in models 1 and 2? On average girls perform better at school and get higher grades. Most likely, this is the reason why they progress to high school more often instead of turning to vocational education. However, when we compare boys and girls with similar academic achievements, there is no gender discrepancy anymore. Thus, we observe general gender inequality in the probability of educational transition—but no secondary effects.

Model 3 controls TIMSS and PISA scores but not school grades or SFE scores. Gender-related differences in the probability of educational transition is preserved in this model, with girls being 6% more likely to progress to 10th grade than boys with similar scores.

Where does the difference between models 2 and 3 come from? Why does the difference in probability of transition between boys and girls virtually disappear when we control for school performance and persist when we control for international tests? TIMSS and PISA mostly test skills in mathematics and science but not in humanities (even the PISA reading test is focused on assessing logical analysis skills). Meanwhile, model 2 controls for grades in Russian, literature, and history. Since girls normally perform better than boys in these subjects, we can suggest that the higher probability of their transition to high school is explained by better knowledge of the humanities, which is not allowed for in model 3. However, such an explanation would be incorrect: the coefficients will remain the same if we drop performance in the humanities from model 2 and only control for achievements in mathematics and science. Thus, the difference between models 2 and 3 cannot be explained by model 3 ignoring humanities skills.

Presumably, this difference occurs because the level of knowledge is not the only factor affecting performance. Important roles are also played by discipline, assiduity, homework commitments, student-teacher relationships, etc. With similar levels of knowledge (assessed by international tests), girls on average get higher grades than boys most likely due to these additional factors. For instance, the average TIMSS score in mathematics was 586 for boys and 555 for girls among students who reported to have Bs in algebra and geometry (average PISA scores for the same students are 541 for boys and 503 for girls). At the same time, female B students in Russian and literature scored 13% higher than male B students in the PISA reading test.

It should also be taken into account that year-end grades and SFE scores were entered into the database as reported by students themselves. If boys are more likely to overestimate their grades than girls, then this could also explain the difference between the results of models 2 and 3. However, we are unable to test this hypothesis, as we do not have objective data on grades.

Finally, model 4 includes all the factors allowed for in models 2 and 3 (i. e. both academic performance and test results). Its results are virtually the same as in model 2, which means that taking into account international tests does not influence the results obtained after analyzing school performance only (year-end grades and SFE scores).

5.2. Parental education and family income

Table 3 displays the results of analyzing the probability of transition to 10th grade for students from families with different educational backgrounds. 87% of students from families where both parents had higher education continued their studies in 10th grade. The proportion is 70% for children with only one highly educated parent. If neither parent has higher education, the probability of transition to high school drops to 47%. Finally, in families where one parent has no higher education and no information is available on the other (these are most often single mothers without a higher education), only 39% of children progress to 10th grade. Thus, we can see a considerable discrepancy in the probability of making a transition to 10th grade between students from families with different levels of education.

Quite often, this difference is explainable through different levels of academic attainment. Children from educated families perform better due to both cognitive and non-cognitive abilities inherited from their parents. However, when we statistically control for academic per-

Table 3. **Results of parental education regression analysis**

Variable	Model 1 (base)	Model 2 (control for academic performance)	Model 3 (control for PISA and TIMSS scores)	Model 4 (control for all factors)
	Coefficient [95% CI]			
Parental education (base category: both parents have no higher education, 38%)				
Both parents have higher education (14%)	0.36*** [0.30; 0.42]	0.16*** [0.10; 0.22]	0.19*** [0.13; 0.26]	0.14*** [0.08; 0.20]
Parent 1: higher education Parent 2: no higher education / N/A (26%)	0.20*** [0.15; 0.25]	0.08*** [0.04; 0.13]	0.12*** [0.07; 0.17]	0.07*** [0.03; 0.12]
Parent 1: no higher education Parent 2: N/A (19%)	−0.09*** [−0.15; −0.02]	−0.05* [−0.10; 0]	−0.06* [−0.12; 0]	−0.04 [−0.10; 0.01]
N/A (3%)	0.05 [−0.09; 0.19]	−0.002 [−0.11; 0.11]	0.01 [−0.11; 0.14]	−0.01 [−0.11; 0.10]
n (number of students)	3,268	3,268	3,268	3,268

Note. Models are the same as in Table 2. All models additionally control for student gender.*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

formance (model 2), the difference between students from more and less educated families becomes less obvious but never disappears. 9th graders whose parents both have higher education are 16% more likely to make it to 10th grade than students with similar final grades and SFE scores whose parents have no higher education.

Year-end grades and SFE scores are only a rough and approximate measure of the level of knowledge. However, when we control TIMSS and PISA scores as a more unbiased instrument (model 3), the difference between children from families with different educational backgrounds becomes even more evident. Students who have parents with a higher education are 19% more likely to continue schooling than their peers whose parents have no higher education, even if their PISA and TIMSS scores are identical. Moreover, the model controlling both academic performance and international test results (model 4) still shows a substantial inequality between students from families with different levels of education

Therefore, while there are no secondary gender effects in educational transitions, the analysis of groups with differing parental education revealed considerable secondary effects. Even with similar levels of attainment and knowledge, the probability of moving to 10th grade is much higher for students from more educated families.

Parental education is not the only way of measuring a family's socioeconomic status. Table 4 presents the models described above for children grouped by family income. Parental education and family income are correlated, though moderately: Spearman's rank correlation coefficient is 0.36 in our sample. The analysis shows similar

Table 4. **Results of family income regression analysis**

Variable	Model 1 (base)	Model 2 (control for academic performance)	Model 3 (control for PISA and TIMSS scores)	Model 4 (control for all factors)	Model 5 (control for all factors + parental education)
	Коэффициент [95%-ный ДИ]				
Family income (base category: under 20,000 rubles/month, 39%)					
20,000–29,000 rubles/ month (26%)	0.10*** [0.04; 0.15]	0.03 [−0.01; 0.07]	0.06** [0.01; 0.10]	0.03 [−0.01; 0.07]	0.01 [−0.03; 0.06]
30,000–49,000 rubles/ month (18%)	0.22*** [0.15; 0.28]	0.09*** [0.03; 0.14]	0.14*** [0.08; 0.20]	0.08*** [0.03; 0.13]	0.05** [0; 0.10]
50,000–79,000 rubles/ month (7%)	0.25*** [0.16; 0.35]	0.13*** [0.06; 0.20]	0.15*** [0.06; 0.23]	0.11*** [0.05; 0.18]	0.08** [0.01; 0.14]
> 80,000 rubles/month (3%)	0.34*** [0.22; 0.45]	0.18*** [0.06; 0.30]	0.19*** [0.07; 0.31]	0.16*** [0.04; 0.28]	0.11* [−0.01; 0.22]
N/A (7%)	0.20*** [0.11; 0.29]	0.11*** [0.04; 0.18]	0.14*** [0.07; 0.22]	0.11*** [0.04; 0.17]	0.11*** [0.04; 0.18]
n (number of students)	3,268	3,268	3,268	3,268	3,268

Note: Models are the same as in Table 2. All models additionally control for student gender. Model 5 additionally controls for parental education.*** p<0.01, ** p<0.05, * p<0.1.

results, with the probability of transition to high school differing for students with different family incomes even after controlling for academic performance and test scores. For example, students from families with incomes over 80,000 rubles/month (only 3% of the sample) are 16% more likely to continue their education in 10th grade than children from families earning less than 20,000 rubles/month (39% of the sample) even after controlling for academic performance and test scores.

Model 5 in Table 4 shows that the significant correlation between family income and the probability of transition to 10th grade is preserved even after control of parental education (in addition to academic performance, test scores, and other variables). It means that both parental education and family income influence the probability of making an educational transition. It was not among our goals to measure the cause-effect relationship or determine whether it is parental education or family income that is more important for student education. Obviously, both the cultural and financial resources of the family contribute to the educational trajectories of students.

6. Conclusions

Russia has lately adopted a myth of universal higher education: it is believed that most young girls and boys enter higher education institutions. However, according to the 2010 census, only 37% of people born in 1981–1985 obtained a higher education (although the rate was higher in Moscow—57%) [Bessudnov, 2012]. It is hardly sensible to focus exclusively on higher education when discussing education policies in Russia. The first “fork” in educational trajectories of students occurs as early as after 9th grade. Only 57% of 9th grade graduates progressed to 10th grade in 2013, and the rate has been steadily decreasing since the mid-2000s.

As we show in this article, a tangible gender and socioeconomic inequality affects educational choices after 9th grade. 61% of girls and 53% of boys move to high school, while the rest of 9th grade graduates opt for vocational education. Socioeconomic inequality is even more pronounced. 87% of children whose parents have higher education are enrolled in 10th grade, compared to 47% of students whose parents do not have a higher education.

The mechanisms of gender and socioeconomic inequality in educational transitions after 9th grade develop in different ways. Girls perform better than boys, and this can explain why they stay in high school more often instead of choosing vocational or trade schools. If we compare boys and girls with similar academic achievements, there will be nearly no difference in the probability of transition to 10th grade between them. Thus, the choice of educational trajectory is affected by primary effects, but not secondary effects, at least for the transition from 9th to 10th grade.

Other conclusions follow when we analyze socioeconomic inequality. Even controlling for both academic performance and test results, we can see a sizeable difference in the probability of moving to 10th grade between students from families with different educational backgrounds and income. The probability differs a lot even for students with similar academic achievements. Statistical control for grades and test results leaves a gap of 14% in the probability of transition to high school between those students whose parents have a higher education and those who do not have a higher education. Thus, we can observe both primary and secondary effects of socioeconomic inequality in choosing educational trajectories after 9th grade.

Why do secondary effects manifest themselves for socioeconomic family characteristics but not for gender? There may be several reasons for this. First, it is important to bear in mind that parents influence the educational decisions of their children. Of course, both parents and students will be guided by the motivation to learn, which is measured by academic performance in one way or another. After allowing for this factor, we observe no obvious differences between parents of boys and girls influencing the educational decisions of their children (although we cannot ignore the possibility of military conscription for boys who did not begin attending a university before 18). However, the behavioral patterns of families with different levels of education and income may differ substantially in this situation. More educated and affluent parents will encourage their children to continue schooling even if their attainment leaves much to be desired. On the contrary, less educated and affluent parents may care less about their children's education and not mind their transition to vocational education, even if the grades are high enough to stay in school.

Second, the attitudes of students matter. Children from families with different socioeconomic status may picture their educational trajectories differently, whatever the direct influence of parents might be. Being affected by the attitudes of their friends and social environment and guided by the example of their own parents, children from more educated and advantaged families may be more enthusiastic about completing high school and entering a university.

Schools and teachers can also play a part in the educational choices of students after 9th grade. The motivation of schools may be different. On the one hand, per capita financing makes schools compete for students with vocational education institutions and promote more students to 10th grade. On the other hand, low-performing students may lower the average USE score for the school and even for the region. Until recently, average regional USE scores were a criterion of governor performance, directly motivating local authorities to achieve high USE rates. Schools and teachers may also treat low-performing students differently depending on the social status of their families. Besides, an important role may be played by school-parent interaction, which depends on the motivation of parents to send their children to high school.

Finally, we need to make an allowance for the activities of secondary vocational education institutions—which also compete for prospective students with schools—being subject to per capita financing. In order to choose vocational education, 9th grade graduates should have such option, meaning that their locality should have institutions offering education programs that might be of interest to students. Secondary vocational training schools are distributed unevenly among regions and localities. The statistical analysis in this article controls regional differences, but there might be a considerable level of inequality in geographical access towards secondary vocational education within the regions. Trade schools and colleges may be concentrated in localities and districts with higher proportions of less educated and affluent families. The extensive offer in the labor market may also be a factor of leaving school after 9th grade for children from such families.

As we can see, the mechanisms of development of secondary effects in educational choices after 9th grade should be analyzed with due regard to the behavior of all actors involved: students, their parents, schools, and schoolteachers, and also secondary vocational education institutions. A deep investigation of these mechanisms requires a separate study applying both quantitative and qualitative methods.

7. Recommendations

Discriminating conceptually between primary and secondary effects of inequality in education is also important for education policies [Jackson, 2013. P. 330–332]. We suggest that such policies seek to reduce educational inequality among students from families with different social characteristics. It is rather hard to change the difference in academic performance between groups of students (primary effects), as it stems from different levels of skills and capabilities, as well as from parental and social influence on the psychological, intellectual, and cultural development of children. State interventions designed to support the development of children from the most disadvantaged families is of undeniable importance, but it is very unlikely to reduce inequality in education.

Reducing secondary effects seems to be a more realistic aim. State interventions to equalize educational opportunities for equally talented children regardless of their family's social characteristics may first of all include working with schools. Schoolteachers and administrators should encourage students from less advantaged families to continue education in 10th grade. The first step in implementing this policy should be the collection of data and school-level monitoring in order to identify the exact proportion of 9th graders from less educated and affluent families who progress to high school.

References

1. Alexandrov D., Tenisheva K., Savelyeva S. (2015) Mobilnost bez riskov: obrazovatelny put "v universitet cherez colledzh" [No-Risk Mobility: Through College to University]. *Voprosy obrazovaniya / Educational Studies. Moscow*, no 3, pp. 66–91.
2. Bessudnov A. (2012) *3 grafika, oprovergayushchikh mif o tom, chto v Rossii mnogo lyudey c vysshim obrazovaniem* [Three Charts Busting the Myth of the High Proportion of People with Higher Education in Russia]. Available at: http://slon.ru/russia/6_grafikov_kotorye_oprovergayut_mif_o_tom_chto_v_rossii_mnogo_lyudey_s_vysshim_obrazovaniem-808854.xhtml (accessed 10 January 2016).
3. Bessudnov A., Kurakin D., Malik V., Yanbarisova D. (2014) *Byulleten Rossiyskogo longityudnogo panelnogo issledovaniya obrazovatelnykh i trudovykh traektoriy. Natsionalnaya panel: pervaya volna (2011–2012)* [Bulletin of the Russian Panel Longitudinal Study on Trajectories in Education and Career. National Panel: first wave (2011–2012)]. Scientific report of the Institute of Education WP 02/IE/2014, Moscow: NRU HSE.
4. Bessudnov A., Makarov A. (2015) School Context and Gender Differences in Mathematical Performance among School Graduates in Russia. *International Studies in Sociology of Education*, vol. 25, no 1, pp. 63–81.
5. Boudon R. (1974) *Education, Opportunity, and Social Inequality*.New York: Wiley.
6. Bourdieu P., Passeron J. C. (1970) *La reproduction éléments pour une théorie du système d'enseignement*. Paris: Editions de Minuit.
7. Breen R., Goldthorpe J. H. (1997) Explaining Educational Differentials: Towards a Formal Rational Action Theory. *Rationality and Society*, vol. 9, no 3, pp. 275–305.
8. Breen R., Jonsson J. O. (2005) Inequality of Opportunity in Comparative Perspective: Recent Research on Educational Attainment and Social Mobility. *Annual Review of Sociology*, vol. 31, pp. 223–243.
9. Buchmann C., DiPrete T.A., McDaniel A. (2008) Gender Inequalities in Education. *Annual Review of Sociology*, vol. 34, pp. 319–337.

10. Cherednichenko G. (2014) *Obrazovatelnye i professionalnye traektorii rossiyskoy molodezhi (na materialakh sotsiologicheskikh issledovaniy)* [Educational and Career Trajectories of Young People in Russia (Based on Sociological Studies)], Moscow: Center of Social Forecasting and Marketing.
11. Coleman J. S., Campbell E. Q., Hobson C. J., McPartland J., Mood A. M., Weinfeld F. D., York R. (1966) *Equality of Educational Opportunity*. Washington, DC: U. S. Department of Health, Education and Welfare, U. S. Government Printing Office.
12. DiPrete T., Buchmann C. (2013) Gender Disparities in Educational Attainment in the New Century: Trends, Causes and Consequences. US*2010: America in the First Decade of the New Century* (ed. J. R. Logan), New York: Russell Sage Foundation.
13. Erikson R., Jonsson J. O. (1996) Introduction: Explaining Class Inequality in Education: The Swedish Test Case. *Can Education Be Equalized? The Swedish Case in Comparative Perspective* (eds R. Erikson, J. O. Jonsson), Boulder: Westview, pp. 1–64.
14. Erikson R. et al. (2005) On Class Differentials in Educational Attainment. *Proceedings of the National Academy of Sciences of the United States of America*, vol. 102, no 27, pp. 9730–9733.
15. Gerber T. P., Hout M. (1995) Educational Stratification in Russia during the Soviet Period. *American Journal of Sociology*, vol. 101, no 3, pp. 611–660.
16. Gerber T. P. (2000) Educational Stratification in Contemporary Russia: Stability and Change in the Face of Economic and Institutional Crisis. *Sociology of Education*, vol. 73, no 4, pp. 219–246.
17. Gutman L. M., Schoon I. (2013) *The Impact of Non-Cognitive Skills on Outcomes for Young People*. London: Education Endowment Foundation. Available at: http://educationendowmentfoundation.org.uk/uploads/pdf/Non-cognitive_skills_literature_review.pdf (accessed 10 January 2016).
18. Halpern D. F., Benbow C. P., Geary D. C., Gur R. C., Hyde J. S., Gernsbacher M. A. (2007) The Science of Sex Differences in Science and Mathematics. *Psychological Science in the Public Interest*, vol. 8, no 1, pp. 1–51.
19. Jackson M., Erikson R., Goldthorpe J. H., Yaish M. (2007) Primary and Secondary Effects in Class Differentials in Educational Attainment: The Transition to A-Level Courses in England and Wales. *Acta Sociologica,* vol. 50, no 3, pp. 211–229.
20. Jackson M., Jonsson J. O., Rudolphi, F. (2012) Ethnic Inequality in Choice-Driven Education Systems. A Longitudinal Study of Performance and Choice in England and Sweden. *Sociology of Education*, vol. 85, no 2, pp. 158–178.
21. Jackson M. (ed.) (2013) *Determined to Succeed? Performance vs Choice in Educational Attainment.* Stanford: Stanford University Press.
22. Konstantinovskiy D., Voznesenskaya E., Cherednichenko G., Khokhlushkina F. (2011) *Obrazovanie i zhiznennye traektorii molodezhi: 1998–2008 gg.* [Education and Life Trajectories of Young People: 1998–2008], Moscow: Institute of Sociology, Russian Academy of Sciences.
23. Kurakin D. (2014) *Russian Longitudinal Panel Study of Educational and Occupational Trajectories: Building Culturally-Sensitive Research Framework*. Moscow: NRU HSE.
24. Legewie J., DiPrete T.A. (2012) School Context and the Gender Gap in Educational Achievement. *American Sociological Review*, vol. 77, no 3, pp. 463–485.
25. Lindberg S. M., Hyde J. S., Petersen J. L., Linn M. C. (2010) New Trends in Gender and Mathematics Performance: A Meta-Analysis. *Psychological Bulletin,* vol. 136, no 6, pp. 1123–1135.

26. Lucas S. (2001) Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects. *American Journal of Sociology*, vol. 106, no 6, pp. 1642–1690.
27. Macdonald K. (2014) PV*: Stata Module to Perform Estimation with Plausible Values*. Available at: https://ideas.repec.org/c/boc/bocode/s456951.html (accessed 10 January 2016).
28. Mood C. (2010) Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It. *European Sociological Review*, vol. 26, no 1, pp. 67–82.
29. Mullis I. V.S., Martin M. O., Foy P., Arora A. (2012) TIMSS*2011 International Results in Mathematics*. Chestnut Hill: TIMSS and PIRLS International Study Centre, Boston College.
30. National Research University—Higher School of Economics (2012) *Obrazovanie v Rossiyskoy Federatsii: 2012. Stat. Yezhegodnik* [Education in the Russian Federation: 2012. Statistical Yearbook], Moscow: NRU HSE.
31. National Research University—Higher School of Economics (2014) *Obrazovanie v Rossiyskoy Federatsii: 2014. Stat. Yezhegodnik* [Education in the Russian Federation: 2014. Statistical Yearbook], Moscow: NRU HSE.
32. OECD (2014) PISA *2012 Results: What Students Know and Can Do. Student Performance in Mathematics, Reading and Science*. Vol. 1. Available at: http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-i.htm (accessed 10 January 2016).
33. Plomin R., DeFries J., KnopikV.S., Neiderhiser J. M. (2013) *Behavioral Genetics*. New York: Palgrave Macmillan.
34. Popov D., Tyumeneva Y., Kuzmina Y. (2012) Sovremennye obrazovatelnye traektorii shkolnikov i studentov [Modern Educational Trajectories of School and University Students]. *Sotsiologicheskie issledovaniya*, vol. 334, no 2, pp. 135–142.
35. Popov D., Tyumeneva Y., Larina G. (2013) Zhizn posle devyatogo klassa: kak lichnye dostizheniya uchashchikhsya i resursy ikh semey vliyayut na zhiznennye traektorii? Na materialakh longityudnogo issledovaniya [Life after 9th Grade: How Do Personal Achievements of Students and their Family Resources Influence Life Trajectories]. *Voprosy obrazovaniya / Educational Studies. Moscow*, no 4, pp. 310–330.
36. Raftery A. E., Hout M. (1993) Maximally Maintained Inequality: Expansion, Reform, and Opportunity in Irish Education, 1921–75. *Sociology of Education*, vol. 66, no 1, pp. 41–62.
37. Shubkin V. (1970) *Sotsiologicheskie opyty (Metodologicheskie voprosy sotsialnykh issledovaniy)* [Sociological Experiments (Methodological Issues in Social Research)], Moscow: Mysl.
38. Shugal N. (2010) Potoki obuchayushchikhsya v rossiyskoy sisteme obrazovaniya [Student Flows in the Russian Education System]. *Voprosy obrazovaniya / Educational Studies. Moscow*, no 4, pp. 122–148.
39. State University Higher School of Economics (2006) *Obrazovanie v Rossiyskoy Federatsii: 2006. Stat. Yezhegodnik* [Education in the Russian Federation: 2006. Statistical Yearbook], Moscow: HSE.
40. State University Higher School of Economics (2010) *Obrazovanie v Rossiyskoy Federatsii: 2010. Stat. Yezhegodnik* [Education in the Russian Federation: 2010. Statistical Yearbook], Moscow: HSE.
41. Wooldridge J. M. (2010) *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT.