

# Educational Strategies of Population: Intergenerational Mobility Analysis

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**Abstract.** Education is one of the main factors affecting intergenerational mobility of the population, and therefore it affects the standard of living. Inequality can be inherited, and one of the tasks of the state is to overcome this tendency. We want to check whether parental education affects children's education. The main research method is the construction of ordinal logistic regressions. Work is based on RLMS data. The paper considers the general intergenerational educational mobility and its gender component. In particular, the following gender lines were identified: "mother-daughter", "father-son". The results of the study confirm the dependence of children's education on the education of parents. In addition, we see that being a male, having a birth or living in a rural area will reduce the likelihood of achieving high levels of education. This indicates the need to support the rural population, increasing the availability of education.

## 1. Introduction

The role and relevance of education in modern society is growing along with economic progress, the complexity of technology, scientific and technological progress. Since the 90-ies the growth of the number of students in higher education was observed in Russia (more than 2.5 times). It should be noted that this growth was due to an increase in the number of contract students. We can argue that the accessibility of education was influenced by family incomes and, accordingly, the conditions in which an adult grew up determined the level of his education. The presence of high-quality educational institutions creates the prerequisites for the influx of students, which create more valuable human capital [11]. Another important characteristic of the Russian education system is its strong differentiation [16]. In large cities there are a large number of universities, while these universities provide the best education. There are territories in which higher education institutions are absent. In addition, there is the opportunity to get education in private institutions. There is an opinion that after the 1990s, the return on education in Russia has increased significantly, but at the moment there is a decline associated with increased differentiation in the quality of graduates.

Nevertheless, it is generally recognized that an increase in the level of education in the country reduces socio-economic inequality, increases the quality of human capital and thereby leads to economic growth. Therefore, studies aimed at assessing the factors affecting human capital and educational level are popular.

Over the past 20-30 years in Russia, the educational system has undergone significant changes. The coverage of children with preschool education has grown, secondary general education is provided on

a budgetary basis, more than 80% of school graduates go to universities. Thus, increasing intergenerational educational mobility can be assumed.

The main goal of our study is to assess intergenerational mobility of the population and its dependence on gender differences. The hypotheses verified in our work can be formulated as follows:

- parental education affects children's education;
- there are gender patterns in the inheritance of education.

## **2. Literature Review**

In the theory of intergenerational mobility of the population, there are various directions, one of them is educational mobility. Consider the main research conducted in the framework of this area essential for our work. Work of Lee A.L. and Willis R. is one of the first in intergenerational educational mobility. They show that the family background matters for future success [9].

Abdurrahman B. Aydemir and Hakki Yazici examine the determinants of intergenerational educational mobility in Turkey [1]. Moreover, in their analysis, they test the hypothesis about the influence of the level of development of the region on the mobility process. They prove that the child's place of residence has a strong influence on its education. The basis for their study was Household Labor Force Survey. Authors analyzed three-generation education mobility and it has been proven that not only the education of parents, but also the education of grandparents are significant factors.

A study by Richard Breen and Jan O. Jonsson shows how family characteristics influence an individual's education and its success in the labor market. Their work lies in the field of analysis of inequality of opportunity [5]. The significance of belonging to a particular race, religious group is shown in the study of Nimubona A-D. Vencatachellum D [10]. Moris Triventi also works in this area. The focus of their research is stratification in higher education and its relationship with social inequality. Main research method – binomial logistic regression models [15].

Irene Brunetti and Davide Fiaschi turned their attention to intergenerational mobility in Italy. Analysis period 1998-2008. The authors constructed mobility indices based on the educational success and occupational status of the respondents. It was shown that intergenerational mobility indices are falling, i.e. we can say that mobility is falling. The authors draw conclusions about the growth of barriers to entry into a number of professions [6]. Azam M. Bhatt V. analyze intergenerational mobility in India [3].

Chetty et al. evaluated intergenerational mobility in the United States [7]. The results showed a linear relationship between the income of the individual and his family. The most significant factors increasing mobility were high school quality, social capital, family stability, and low population segregation. Stefan B. Andrade and Jens-Peter Thomsen's article provides a comparative analysis of intergenerational educational mobility in the United States and Denmark. The authors argue that this figure is higher in Denmark [2].

One of the fundamental works on this subject is research of Tom Hertz et al [8]. The paper assesses the 50-year trend of educational mobility in 42 countries. It proved that the Latin America countries are characterized by the highest level of intergenerational educational mobility and the Nordic countries the smallest. The contribution of the work is to assess mobility indicators for developing countries. The research data was provided by the European Social Survey, International Social Survey Program and International Adult Literacy Survey. However, the results obtained by the authors are quite controversial. Two measures were used for intergenerational mobility: correlation and coefficient in the regression equation. The first measure indicates that mobility has not changed, and the second measure has been declining.

For Russia, there is little empirical and computational research in the field of intergenerational mobility of the population. To best of our knowledge one of the most popular work in this area can be called research – Intergeneration Educational Mobility in Russia and the USSR [13]. The work is general in nature, its main purpose is to assess the factors that influence intergenerational educational mobility of the Russian population. The author comes to the conclusion that at the current time (2011),

the education system in Russia is more likely to fix existing social inequality than to promote intergenerational mobility of the population.

The work of Borisov and Pessaridis is based on the RLMS data for 1994-2013 [4]. The results show that education plays an important, but not the main, effect, while the initial family income and various informal informational factors play a more important role in shaping the level of intergenerational income inequality and social mobility.

**3. Methodology**

The purpose of this study is to evaluate intergenerational educational mobility in Russia. This work is based on data from Russia Longitudinal Monitoring Survey of HSE (RLMS - HSE) for 2011. This is the last period that contained questions about the education of the respondent's parents.

We limited the sample by age: 25-60 years, the total sample size was 2238 respondents. Table 1 presents the main variables used in the work.

**Table 1.** List of variables.

UrbanBorn	A dummy variable that takes the value 1 if the individual was born in an urban settlement and 0 if in an rural
Urban	Dummy variable that takes the value 1 if the individual lives in an urban settlement and 0 if in an rural
EducMother	Dummy variable that takes the value 1 for incomplete secondary education, 2 - secondary education, 3 - specialized secondary education, 4 - higher education and more
EducFather	Dummy variable that takes the value 1 for incomplete secondary education, 2 - secondary education, 3 - specialized secondary education, 4 - higher education and more
male	Dummy variable taking the value 1 if the individual is male
age	Age of individual, years
education	The level of education, takes the value 1 for incomplete secondary education, 2 - secondary education, 3 - specialized secondary education, 4 - higher education and more

We will evaluate the following model of the probability of acquiring an education of a certain level. The main evaluation method is the construction of ordinal logistic models.

$$\text{Education} = \beta_1 \text{Mobility} + \beta_2 \text{Control} + \beta_0$$

Education – individual education;

Mobility – variables are responsible for the education of parents;

Control – control variables.

When constructing a model that evaluates the impact of parental education on children's education, we model the probability of an event:

$$\Pr(\text{outcome}_j=i) = \Pr(\kappa_{i-1} < \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_k x_{kj} + u_j \leq \kappa_i)$$

k – number of possible outcomes;

$u_j$  – random error, is assumed to be logistically distributed in ordered logit.

In the results of the evaluated model, we will be interested in ordered log-odds (logit) regression coefficients. If we get a positive coefficient, we can say that a one unit increase in Mobility or Control variables increase in the ordered log-odds of being in a higher Education.

Models will be built for the general sample when the maximum level of education of the individual, father and mother is included. And two more models on gender lines: “mother-daughter” and “father-son”. Payne and Abbott proposed considering subdivisions into such categories to take into account gender specifications [12].

**4. Results**

*4.1 Intergenerational mobility focus*

If we consider the data on the educational level of respondents and their parents (table 2), then we can note that children are significantly superior to parents in educational level. So in the 4th maximum

level there were 2 times more children than their parents. And the number of individuals in the first level (who did not finish high school) got at least 5 times less children than their parents. Those we can note a positive trend - the level of education in Russian society is increasing. In addition, a gender feature is clearly traced in this pattern: for women, changes in the educational level are more significant. In the maximum fourth category there was an increase of more than 2.5 times (comparison on the line “mother-daughter”).

**Table 2.** Distribution of respondents and their parents by level of education, %

Education	Respondent	Male respondent	Female respondent	Respondent's father	Respondent's mother
1	8,31	12,41	5,19	50,63	43,34
2	31,46	38,64	25,96	18,10	20,51
3	27,30	19,54	33,2	14,66	22,12
4	32,93	29,37	35,64	16,62	14,03
TOTAL	100,00	100,00	100,00	100,00	100,00

*4.2 Regression analysis*

Descriptive statistics of the variables used in the study are presented in Appendix A. The results of the regression analysis are presented in Table 3.

**Table 3.** Models.

Variable	ologit_All	ologit_Man	ologit_Woman
EducMother			
2	.50659659***		.51521977***
3	1.1499924***		1.4732305***
4	1.7281137***		2.4337472***
EducFather			
2	.34061595**	.8036873***	
3	.66928356***	1.506279***	
4	1.0995797***	1.9712281***	
age	-0,01457571	0.0124415	-.06398775
agesq	0,00036581	6.886e-07	.00079735
male			
1	-.73253213***		
urban			
1	.33977643***	.65344744***	0,19502325
urbanBorn			
1	.40800769***	.40942315**	.52540296***
N	2238	967	1271

Note: 0.01 - \*\*\*; 0.05 - \*\*; 0.1 - \*.

The results of the regression analysis show a positive statistically significant positive effect of parental education on the educational attainment of children. This is also evident in the study by Roshchina, which shows that the respondent's chances of not getting a higher education will increase if the human capital of his parents is low [13]. At the same time, gender differences are clearly visible.

In the general sample, the coefficients for the education of mothers are higher, i.e. it is more significant. On the mother-daughter line, the coefficient is higher for the 4th level of education, while for the father-son line, the coefficients in the second and third groups are higher.

Control variables have the expected signs. Belonging to the male level is negatively important for education. This is consistent with statistics that suggest that in Russian society there are more women with higher education than men. Birth or living in urban areas has a positive effect on the level of education of children. Our analysis of how mobility changes with socioeconomic development is related to Chetty et al. who find that intergenerational mobility varies significantly over geographic areas in the United States [7]. Moreover, the place of birth was significant for women. This can be explained by the fact that it is more difficult for women to get an education if they did not do it right after university, since they leave the labor market when they give birth to a child, and the time for getting an education also becomes less. Therefore, access to education is more important for women, and in urban areas it is higher.

Age in our study was not significant. This can be explained by the fact that in our sample there is a population of 25-60 years, and in Russian society the maximum level of education by the majority of the population by this age (25 years) has already been achieved.

## 5. Conclusion and policy implications

The paper attempts to analyze intergenerational educational mobility in Russia. We hypothesized that parental education affects children's education.

The main factors of educational mobility were the conditions of socialization and parental education, as well as the gender and place of residence of the respondent. It was found that the lower the educational level of parents, the greater the likelihood of upward educational mobility of respondents. This can be explained by the fact that, having a low level of education, parents strive to give their children a better education, stimulate them to accumulate human capital.

An important factor is gender and place of birth. The place of birth, namely the urban status of the settlement increases the chances of getting a higher education. This can be explained by the availability and quality of education in big cities. This gives us the opportunity to conclude that it is necessary to take additional measures in the field of educational policy in the village. In addition, we found that intergenerational educational mobility is higher for women who grew up in the city. In addition, the mother-daughter gender line increases the likelihood of higher levels of education.

In further studies, it is necessary to analyze the intergenerational educational mobility of the population by age cohorts, which will make it possible to estimate its value. In addition, intergenerational educational mobility indices based on microdata can be calculated. Then trace the contribution of a country's economic characteristics to mobility. For example, Russino A. assesses the impact of the country's financial development on intergenerational mobility of the population [14]. Another interesting area is an attempt to assess the changes taking place in the higher education system.

## 6. Appendices

**Appendix A.** Descriptive statistics of the variables.

Variable	Mean	Std. Dev.	Min	Max
male	0,432	0,495	0	1
age	43,784	10,14	25	60
urban	0,651	0,476	0	1
education	2,848	0,976	1	4
EducFather	1,972	1,147	1	4
EducMother	2,068	1,1	1	4
urbanBorn	0,382	0,486	0	1

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