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Does education affect trust? Evidence from Russia

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DOES EDUCATION AFFECT TRUST?

EVIDENCE FROM RUSSIA

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On individual level education is the strongest predictor of trust and civic activities such as organizational participation and work for NPO. We also fund that impact of average level of education in community is much stronger among less educated people. Opposite, individuals with higher levels of education tend to trust and participate in civic activities regardless to their educational environment.

Key words: education, trust, social norms, social capital, externalities

The great aim of education is not knowledge, but action

Herbert Spencer

1. Introduction

It is been almost forty years since Kenneth Arrow wrote that "Virtually every commercial transaction has within itself an element of trust <...>. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence" (Arrow, 1972). Since then many empirical studies have confirmed that trust is indeed an important resource for economic development. Mutual trust can help to solve common problems and compensate for both market and government failures. For instance, a high level of confidence allows economic agents to solve problem of contract incompleteness; strong social ties can reduce costs of free riding in public good provision.

However, it is not very clear why societies differ in trust levels. Alesina and La Ferrara note that "the theory of what determines trust is sketchy at best" (Alesina, La Ferrara, 2002). Empirical evidence shows that both individual and social characteristics are correlated with interpersonal trust. The most important are income, education, racial composition of the society and personal traumatic or discrimination experience. These studies provide a good "road map" (especially important in case of lack of coherent theory), but they does not prove causality.

This paper attempts to construct empirical evidence on causal effect of education on trust and some other measurers of civic behavior in Russia. The study consists of two parts. First part analyses cross-regional variation in level of trust. Using data from Georating sociological study, we found that average level of education has a strong and statistically significant effect on trust across Russian regions. This correlation holds even after controlling for other important determinants of trust, such as income, inequality, population density and ethnic composition. Next, we use historical data on secondary school attainment as an instrument for today's education. In 1920s and 1930s Soviet government established compulsory education system for children as well as for illiterate adults. Millions of them all over the country were enrolled in special literacy schools. By 1939 literacy rates and secondary school enrollment raised significantly. This data provide an exogenous source of cross regional variation in educational level and allow estimating the effect of education on trust. Using two-stage least squares strategy we found that one standard deviation increase in average educational level in region leads to more than one standard deviation increase in trust level. This result is not driven by outliers.

Second part of the study devoted to individual level analysis. We found that people with higher education are more likely to answer positively on trust question. They are more likely to participate in different associations ("Putnam groups") and work for non-profit organizations. Using personal discount rate as a control for unobservable individual characteristics we apply two-stage estimation strategy and confirm this result.

We also test comparative influence of personal education and education in social environment. The impact of average level of education in community is much stronger among less educated people.

Opposite, individuals with higher levels of education tend to trust and participate in civic activities regardless to their educational environment.

The paper organized as follows. Next section reviews some literature on the subject. Section 3 presents the data and some simple correlations. Section 4 provides regional level analysis using IV regression approach. Section 5 displays individual level probit regressions using personal discount rates as an instrument. Section 6 concludes. Section 7 discusses some implications for further research.

2. Previuos Literature

Empirical studies show that trust and respect for civil norms positively affect the functioning of formal institutions and quality of government (Putnam, 1993; La Porta et al., 1997; Tabellini, 2008), economic growth, investment and financial development (Knack, Keefer, 1997; Guiso, Sapienza, Zingales, 2004). General conclusion to be drawn from these studies is that trust provides the "missing link" between distant political and economic history and the functioning of current institutions. In light of these results it is important to understand the determinants of trust and civic norms. If trust and civic values are very slow moving forces what can be done to its accumulation in the society? What factors most strongly affect trust, norms and civic engagement?

In study on dynamics of social capital in the USA Robert Putnam notes that ''education is by far the strongest correlate that I have discovered of civic engagement in all its forms'' (Putnam, 2001). Community organizations, the level of trust, the perception of fairness, participation in nonprofit organizations – all of these dependent variables are   explained   by individual's   educational   level   to a greater extent than any other factor.

Starting with the work of Seymour Lipset (Lipset, 1960) social scientists actively use the idea that education has non-economic spillover effects. According to the author, most important result of raising educational level is not so much technological as social. Positive externalities of education reduce the level of violence in society, to replace weapons in resolving conflicts people use courts and legislatures. These changes will contribute to better protection of property rights and, finally, economic growth.

Recent empirical studies suggests that education is important, and sometimes the most important factor of political and social engagement. Nee and co-authors (Nie, Junn, Stehlik-Barry, 1996) showed, in particular, as the growing level of education of an individual has a positive effect on the probability of trust in strangers, tolerance, civic engagement and participation in elections. Helliwell and Putnam (Helliwell, Putnam, 2007) showed that many types of social interaction, including membership in various clubs and organizations, positively depend not only on the education of the individual, but on the average level of education in the region of residence.

Dee (Dee, 2004) studies non-economic return on education in the U.S. and finds that relationship between education and civic activity is causal in nature. Using geographic proximity and density of junior and community colleges as an instrumental variable for education, he shows that education is the strongest

predictor of various indicators of civic engagement (voting in elections, participation in organizations, etc.). Furthermore, additional schooling appears to increase the quality of civic knowledge – more educated person tends to receive information from magazines and newspapers, not only through television and communicating with friends.

Milligan with co-authors (Milligan, Moretti, Oreopoulos, 2004) in a similar study on the U.S. and Britain used as an instrument the adoption of compulsory schooling laws[1] and found that educational attainment is related to several measures of political involvement in both countries. In Oreopoulos et al. (Oreopoulos, Salvanes, 2009) they show that experiences and skills acquired in school reverberate throughout life, not just through higher earnings. Schooling affects the degree one enjoys work and the likelihood of being unemployed. It leads individuals to make better decisions about health, marriage, and parenting and also improves trust and social interaction.

Our conclusion from these studies is that education generates positive externalities in the form of enhanced political behavior, rising interpersonal trust and civic norms. Therefore, effects of education extend beyond the economic sphere. Can we say that education's ability to create non-economic benefits are universal and can be traced in all countries? The aim of this work is to test empirically this hypothesis on data from Russia.

3. Data Description

The main database used in the study is sociological survey of the Public Opinion Foundation called "Georating". The survey was conducted in 2005 in 68 regions of Russia. Total sample size – 34 000 respondents (500 respondents in each region). The sample is representative by region, allowing for analysis both at the regional and individual level. The Georating asks a standard question used in many social science surveys: "Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?" At the regional level we use the percentage of positive answers as an indicator of trust level in the region. At the individual level the answers are coded binary – 1 if person answers positively (most people can be trusted) and 0 if the answer is negative (need to be very careful). Georating survey asks a number of questions that also can be interpreted as indicators of civil engagement. In addition to trust on individual level we use another three dependent variables that characterize social capital[2]:

- Social cohesion;
- Participation in organizations;
- Voluntary work for non-profit organizations;

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[1] In various states compulsory schooling laws were established at different times and set a different duration of secondary education. Legislative differences have led to a noticeable variation in average level of education by state, but it had nothing to do with the indicators of civic engagement. This fact allows use them as an instrumental variable.

[2] For detailed description and questions see Appendix

In addition to Georating we use Rosstat[3] official database on regional differences in per capita income, inequality (Gini coefficient), population density and ethnic fractionalization.

Descriptive statistics for dependent and explanatory variables are presented in Table 1.

Table 1. Descriptive Statistics

Variable	Mean	Median	Std. deviation	Min	Max	N
Trust, %	18.4	17.5	4.8	10.0	35.0	68
Social cohesion, %	15.9	14.0	5.6	6.0	31.0	68
Participation in organizations, num.	0.2	0.2	0.1	0.03	0.4	68
Voluntary work in NPO, hours per month	2.5	1.9	2.1	0.09	12.6	68
Average level of education, years	11.8	11.8	0.4	11.1	12.86	68
GRP per capita in 2005, thousand rubles	117.3	88.0	134.2	40.1	949.6	68
Gini coefficient	0.4	0.4	0.04	0.3	0.6	68
Population density, per sq. km	214.5	23.5	1 204.1	0.4	9 438.9	68
Fractionalization index	0.25	0.20	0.16	0.07	0.72	68

For detailed description and questions see Appendix.

On average across regions percent of trusting people is 18.4 with standard deviation 4.8. On the issue of social cohesion and solidarity in today' Russian society only 16% of respondents answered positively (with standard deviation across the regions 5.6%). Only 2 persons out of 10 participate in a non-profit organizations or voluntary associations (so-called "Putnam groups"). According to survey about 9% of respondents during the last year worked for non-profit organizations. Average time worked is about 2,5 hours per month.

The main explanatory variable in our analysis is educational level, measured by years of schooling. At the regional level of analysis I consider average level of education in the region (11.8 years across regions with standard deviation 0.4). At the individual level – number of years spent by each respondent on education (including primary, secondary and high school, college or university).

Table 2 shows pair wise correlations between average level of education in the region (in years) and the indicators of social capital mentioned above. It is evident that education is positively correlated with all indicators of social capital. The strongest link with trust level (0,5) and social cohesion (0,45). All coefficients are statistically significant at the 1% level.

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[3] Federal State Statistics Service is the official statistic agency in Russian Federation, www.gks.ru

Table 2. Pairwise Correlations Coefficients

	Average level of education in region (years)	Trust	Social cohesion
Trust	0.50***		
Social cohesion	0.45***	0.74***	
Participation in organizations	0.33***	0.19	0.09

*** - statistically significant at the 1% level.

Next section presents more detailed analysis, taking into account the role of other factors.

4. Determinants of Cross-Regional Variation in Trust

A. Ordinary least-squares regressions

Table 3 presents ordinary least-squares regressions of trust on average educational level in region (years)[4]. The linear regressions are for the equation:

$$(1) \qquad Trust_i = \beta_0 + \beta_1 Education_i + \beta_2 X_i + \varepsilon_i,$$

where Trust is percentage of respondents in a region i who answered positively on the question; Education is average educational level in region i in years normalized to have mean equals 0 and standard deviation equals 1; X is a vector of other covariates; ε is a random error term. The coefficient of interest is β_1 that shows the effect of one standard deviation change in average level of education on trust across Russian regions.

Column (1) shows the results of simple regression model. The coefficient on education is positive and statistically significant at the 1% level. It shows that increase in one standard deviation in average educational level associated with 2.4% increase in the level of trust. Considering that standard deviation in trust across regions is 4.8%, a standard deviation increase in average educational level associated with 0.5 standard deviations increase in trust (2.4/4.8=0.5).

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[4] Normalized to have mean equals 0 and standard deviation equals 1.

Table 3. OLS Regressions

	Dependent variable is Trust, %					
	(1)	(2)	(3)	(4)	(5)	(6)
Average level of education, years	0.0242***	0.0247***	0.0256***	0.0299***	0.0298***	0.0300***
	(0.0057)	(0.0055)	(0.0051)	(0.0051)	(0.0052)	(0.0047)
GRP per capita in 2005, thousand rubles		-0.00372	0.00724	0.00149	0.00194	-0.00417
		(0.00985)	(0.0151)	(0.0155)	(0.0151)	(0.0148)
Gini coefficient			-0.246	0.0409	0.0507	0.0239
			(0.205)	(0.225)	(0.239)	(0.246)
Population density, per sq. km				-1.28e-05***	-1.30e-05***	-0.000474***
				(4.24e-06)	(4.49e-06)	(0.000155)
Fractionalization index					-0.00881	-0.00538
					(0.0301)	(0.0298)
Constant	0.184***	0.227**	0.193	0.154	0.148	0.240*
	(0.0050)	(0.112)	(0.126)	(0.129)	(0.126)	(0.122)
Observations	68	68	68	68	68	66
R-squared	0.260	0.262	0.283	0.334	0.335	0.392

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Columns from (2) to (5) add additional variables in the regression. We gradually take into account impact of gross regional product per capita, income inequality (measured by Gini coefficient), population density and index of ethnolinguistic fractionalization. The coefficient of interest is quite similar across different specifications. It rises a little bit as new additional variables considered and stays statistically significant at the 1% level.

The last column (6) presents the same regression as in (5). The only difference is omission of two major cities in Russia – Moscow and St. Petersburg. These cities are treated by Russian laws as "federal cities" (goroda federal'nogo znacheniya) that is as separate regions. These "two capitals" of Russia are regions with highest educational level, income per capita and population density. We omit them in order to insure that our results are not driven by outliers. Inclusion of additional control variables and omitting the outliers increases the coefficient on educational level and confirms its statistical significance. Figure 1 shows the relationship between education and trust as the result of multiply regression in column (6).
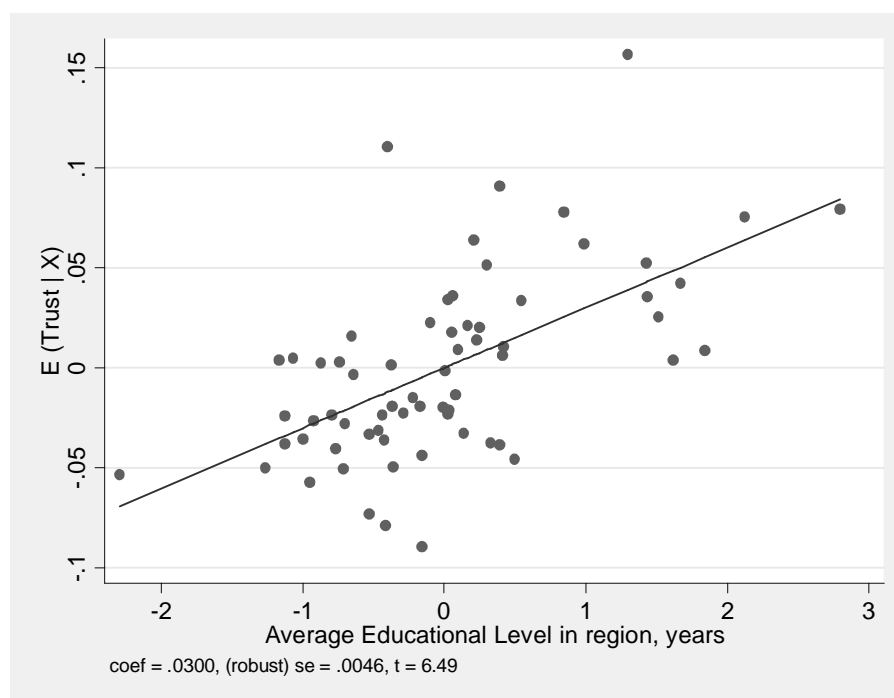
coef = .0300, (robust) se = .0046, t = 6.49

Figure 1. OLS Relationship Between Education and Trust

Of course, this result doesn't prove that the relationship between education and trust is causal. There are at least two problems that need to be solved to prove the causality. First is the problem of reverse causality. It's possible that some regions with high initial trust levels enjoy high standards of living and therefore higher level of education. Second, and perhaps, more important, there are many omitted determinants of trust differences what can be correlated with education. Omitting them from the equation lead to an upward bias in estimated coefficient. To obtain an unbiased estimator we use the instrumental variables strategy (IV regression).

B. IV regressions

We can think of the variation in education across regions as having two parts. One part is correlated with random error term, i.e. with determinants of trust not included in equation (1). Second part that is uncorrelated with ε. If we could isolate the second part and find a valid instrumental variable that is uncorrelated with the variables omitted in regression (1), then we could obtain an unbiased estimations of β_1 (Stock, Watson, 2007). Such an instrumental variable must be an important factor accounting for variation in today's educational level, but have no direct effect on trust. What could that be? Perhaps, history can provide a plausible instrument.

In 1920s Soviet government established a new policy of likbez ("liquidation of illiteracy"). The new system of universal compulsory education was introduced for children as well as for illiterate adults. Millions of them all over the country, including residents of small towns and villages, were enrolled in special literacy schools. The most active phase of likbez lasted until 1939. According to population census in 1926 the literacy rate was 56.6 percent of the population. By 1937 the literacy rate was 86% for men and 65% for women, making a total literacy rate of 75%.

We found that proportion of people with secondary education in 1939 strongly correlated with average years of education in 2005[5]. At the same time education in 1939 does not correlate with trust level or other determinants of trust across regions. This fact allows us to isolate the part of the variation in educational level in 2005 from other factors that influence trust level and use historical data on education as an instrument for today's educational level.

Figure 2 shows the correlation between percent of people with secondary education in 1939 and average educational level in 2005.
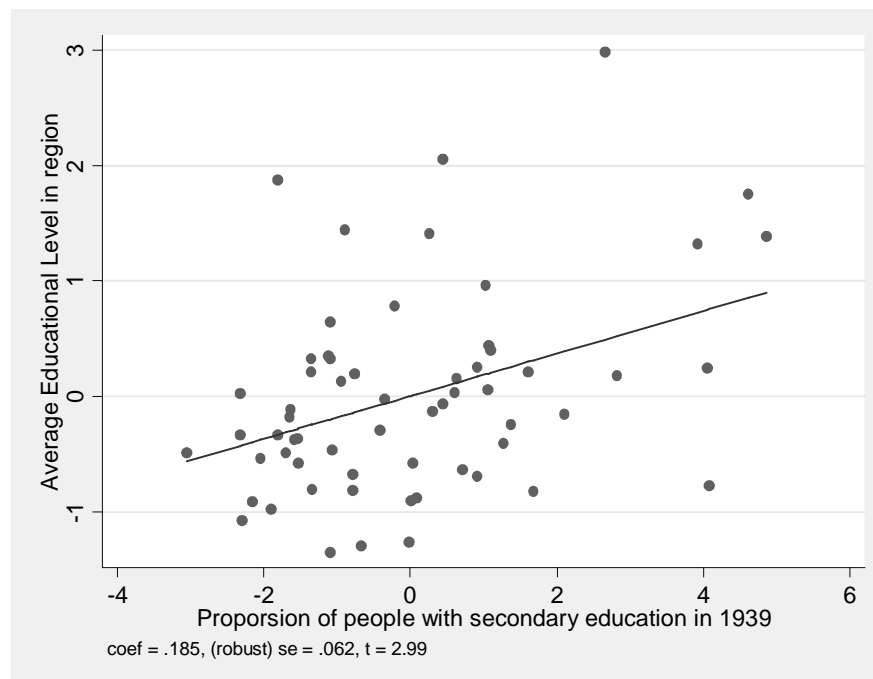

Figure 2. Education in 1939 and in 2005

The regression coefficient is statistically significant at the 1% level and shows that a one percent increase in proportion of people with secondary education in 1939 ends in 0.19 standard deviations increase in average educational level in years in 2005. Taking into account this fact we apply two stage least squares method and estimate the parameters of the following system of equations:

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[5] Data for 1939 taken from Population Census data in 1939.

(1) $$Trust_i = \beta_0 + \beta_1 Education_i + \beta_2 X_i + \varepsilon_i,$$

(2) $$Education_i = \gamma_0 + \gamma_1 Education\ in\ 1939_i + \gamma_2 X + \epsilon,$$

Education in 2005 is treated as endogenous and modeled as a result of educational policy in 1920-30s and other variables described above. The results of two stage estimates are reported in Table 4. Panel A reports 2SLS estimates of the coefficient of interest β_1 from equation (1) and Panel B gives the corresponding first stages. We exclude Moscow and St. Petersburg in all regressions.

Table 4. Instrumental Variable Regressions of Trust

| | Panel A: Two-Stage Least Squares. Dependent variable is Trust | | | | |
	(1)	(2)	(3)	(4)	(5)
Average level of education, years	0.053**	0.051*	0.053*	0.055**	0.055**
	(0.0226)	(0.0266)	(0.0280)	(0.0251)	(0.0256)
GRP per capita in 2005, thousand rubles		0.0044	-0.00011	-0.0111	-0.0113
		(0.0203)	(0.0276)	(0.0277)	(0.0274)
Gini coefficient			0.0975	0.109	0.107
			(0.266)	(0.276)	(0.298)
Population density, per sq. km				-0.000544**	-0.000544**
				(0.000213)	(0.000215)
Fractionalization index					0.00245
					(0.0340)
Constant	0.188***	0.138	0.153	0.290	0.292
	(0.00620)	(0.233)	(0.256)	(0.258)	(0.256)
R-squared	0.16	0.18	0.16	0.20	0.20

	Panel B: First Stage for Average Level of Education in region				
People with secondary education in 1939, %	0.185***	0.159**	0.156**	0.156**	0.157**
	(0.0618)	(0.0608)	(0.0612)	(0.0636)	(0.0664)
GRP per capita in 2005, thousand rubles		0.481**	0.527*	0.517	0.516
		(0.227)	(0.297)	(0.331)	(0.333)
Gini coefficient			-1.186	-1.177	-1.255
			(4.066)	(4.104)	(4.279)
Population density, per sq. km				-0.000538	-0.000542
				(0.00470)	(0.00476)
Fractionalization index					0.0680
					(0.523)
Constant	-1.35***	-6.62**	-6.69**	-6.57**	-6.50**
	(0.407)	(2.491)	(2.561)	(2.926)	(2.936)
Observations	61	61	61	61	61
R-squared	0.15	0.19	0.19	0.19	0.19

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The results show a significant effect – one standard deviation increase in average educational level in region leads 5.5% increase in trust that is more than one standard deviation.

In Table 5 we provide a simple version of overidentification test. We directly add to the equation (1) Education in 1939 as an additional regressor. If it had a direct effect on trust level in 2005 we would expect this variable to come statistically significant with positive sign. In fact in all cases it is very small and

statistically insignificant. So we can reject the hypothesis that historical data on education have a direct effect, or an effect working through a variable other that Education in 2005, on trust level.

Table 5. Overidentification Test

	Dependent variable is Trust, %				
	(1)	(2)	(3)	(4)	(5)
Average level of education, years	0.0269***	0.0253***	0.0253***	0.0251***	0.0251***
	(0.00511)	(0.00505)	(0.00504)	(0.00420)	(0.00421)
People with secondary education in 1939, %	0.00474	0.00412	0.00426	0.00466	0.00472
	(0.00345)	(0.00364)	(0.00370)	(0.00327)	(0.00331)
GRP per capita in 2005, thousand rubles		0.0169	0.0143	0.00433	0.00425
		(0.0132)	(0.0179)	(0.0176)	(0.0175)
Gini coefficient			0.0651	0.0740	0.0689
			(0.234)	(0.235)	(0.256)
Population density, per sq. km				-0.00056	-0.00056***
				(0.000139)	(0.000140)
Fractionalization index					0.00450
					(0.0295)
Constant	0.153***	-0.0341	-0.0298	0.0933	0.0946
	(0.0232)	(0.147)	(0.153)	(0.148)	(0.147)
Observations	61	61	61	61	61
R-squared	0.35	0.37	0.37	0.45	0.45

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5. Individual level analysis

A. Probit regressions

Can we say that education has an impact on trust at the individual level? Figure 3 shows that the link between education and trust on regional level is not only a result of the averaging effect, but appears stable at the individual level.
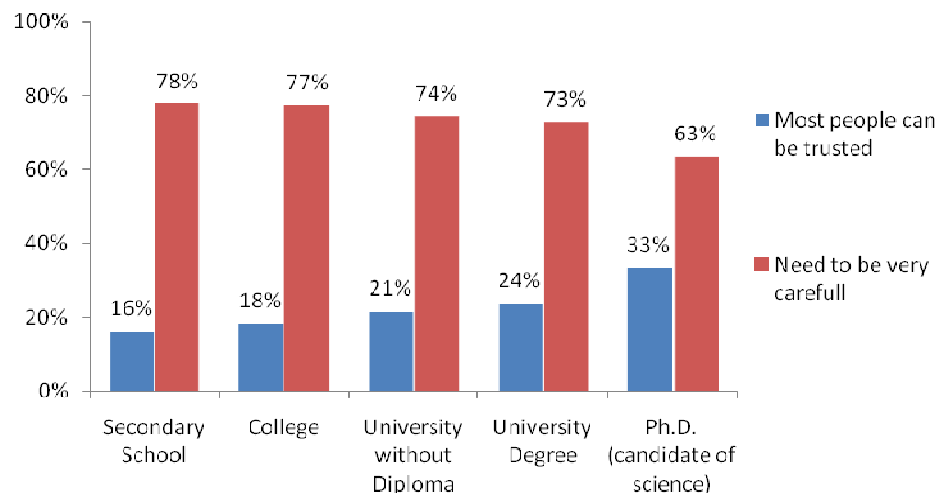

Figure 3. Education and Trust on Individual level

Percentage of respondents responding positively to the "trust question" increases with the level of education. Among people with higher education the share of positive answers 50% higher than among people with secondary education (24% vs. 16%, respectively). Among people with science degrees and second higher education (we have 177 such persons in the sample), 30% tend to trust strangers rather than be very careful. Can we conclude from this that high level of education is a sufficient condition for cooperative behavior?

Game theory argues that all social interactions are strategic in nature. It means that the choice of particular decision depends on the decisions made by others (Aumann, 2008). In the context of the question posed, this means that the probability of cooperative behavior of the individual will be determined not only by its own level of education, but the level of education in its environment. Result of the interaction depends on the relative strength of each of these two factors. As Helliwell and Putnam noticed:

"my behavior can be affected not only by my education, but also by that of others around me. The core issue is whether (holding constant my own education), I am more likely or less likely to participate politically and socially if those around me become more educated" (Helliwell, Putnam, 2007, p. 1).

The same issue can be drown for trust and civic activities. Schematically, the effect of education on trust is shown in Figure 4.
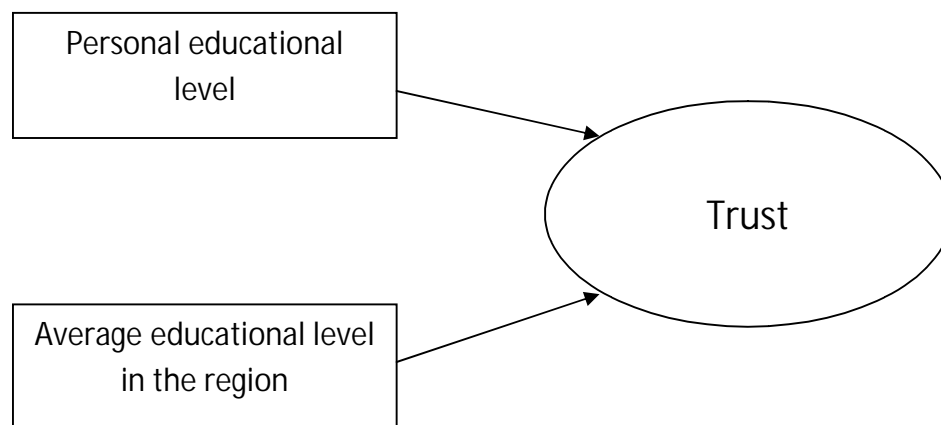

Figure 4. How Education Affect Trust

According to this scheme there are three effects that determines the nature of the impact of education on trust in community – absolute, relative and cumulative (Nie, Junn, Stehlik-Barry, 1996). Absolute effect occurs when probability of trust and cooperative behavior depends on the individual's own education level and independent of the average level of education in environment. Relative effect occurs when the probability of trust depends only on the average level of education in individual's social

environment. Cumulative effect is observed when social environment and educational characteristics of the individual complement each other.

We test among these possibilities by defining separate variables for an individual's own education, and for educational level in the individual's environment. We define educational level in environment as an average educational level in the region of residence[6].

We estimate the parameters of regression equations of the following form:

$$(3) \qquad P\ (y{=}1\,|\,x) = \beta_0 + \beta_1 E + \beta_2 C + \beta_3 x_3 + ... + \beta_n x_n + \varepsilon\ ,$$

where P – is the probability of trust or other civic behavior;

E – personal educational level in years;

C – average educational level in the region of residence;

x^3 - x^n – controls for social-demographic regional variables;

ε – error term.

This equation is a probit-model where the   dependent variable takes   the   value 1 if the   answer   is positive, and 0 otherwise. Dependent variables are:

- Trust
- Social cohesion
- Participation in organizations
- Voluntary work in NPO

Control variables in all equations are sex, age, family income, and regional differences, presented by per capita GRP, Gini coefficient and population density in the region of residence. Table 6 presents results of   the analysis. It   is   worth noting   that   the   interpretation   of the   coefficients   based   on the following definitions (Campbell, 2006):

1. Positive and statistically significant coefficient on personal educational level (E) and insignificant coefficient on average educational level in the region of residence (C) indicates on the absolute effect of education.

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[6] Various studies have provided different definitions of what can be considered "educational level in environment." Nie, Junn, Stehlik-Barry (1996) use average level of education in the country as a whole. Helliwell, Putnam (2007) have criticized this approach, and used in their calculations average level of education in Census region (a group of U.S. states). In our study, we use regional data. Of course, this method is not without flaws, and localization can be even lower (district or city). Ideally, degree of localization must meet the breadth of distribution of externalities of education.

2. Statistically insignificant coefficient on personal educational level (E) and the significant positive coefficient on average educational level in the region of residence (C) indicate on relative effects of education.

3. Positive and statistically significant coefficients both on personal educational level (E) and average educational level in the region of residence (C) indicate on cumulative effect.

Table 6. Absolute, relative and cumulative effects of education

	Personal level of education, years	Average educational lelve in region, years
Dependent variables		
Trust	0.0333*** (0.0047)	0.2476*** (0.0319)
Social cohesion	0.0051 (0.0050)	0.3150*** (0.0326)
Participation in organizations	0.0970*** (0.0055)	0.0315 (0.0349)
Voluntary work in NPO	0.3806*** (0.0824)	0.1727 (0.5596)
Age	yes	
Sex	yes	
Family income	yes	
Regional variables	yes	
N (not less than)	23 864	

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

These results demonstrate, firstly, positive correlation of all indicators of social capital with the level of education. This result follows the results of other international studies on this topic (Dee, 2004; Helliwell, Putnam, 2007).

At the same time, the nature of the relationship is not universally defined. Different components of social capital respond differently to changes in the educational level.

Trust is closely connected with education via cumulative effect. Increasing personal level of education of the individual holding constant average level of education in her environment will have a positive impact on the individual's propensity to trust strangers. The same thing happens in case of increasing average level of education in the environment holding constant personal level of education.

Social cohesion associated with the relative effect - only the level of education in an environment of an individual influences her perception of social cohesion. This question was worded in such a way that the answer is implied assessment of cohesion in society at the moment. Naturally, that individual's perception

of these qualities will largely depend on the characteristics of a community in which she lives, than on her personal characteristics.

Participation in organizations and voluntary work in the NPO are the subjects to the absolute effect – only a personal level of education significantly affects the probability of a positive answer to these questions. Increasing average level of education in the community would have no impact on a person in terms of the probability of its participation in various non-profit organizations.

Is it possible to evaluate the relative strength of various effects of education? In other words, what is stronger – individual characteristic or environment influence? To answer this question, we divided the sample into two groups on the median level of education. First group consisted of respondents who had studied at least 13 years (primary, secondary and high school). Second group - respondents who had studied for 13 years or more (bachelor, master's degree and PhD.). For each of the groups we estimate the parameters of regression equations of the form (1) with different variations of the dependent variable. Thus, we have a comparative evaluation of the impact of personal educational level and educational level in social environment in groups of highly educated and lower educated respondents. Results are presented in Table 7.

Table 7. Absolute, relative and cumulative effects of education for different groups

	Group 1 Studied less than 13 years		Group 2 Studied 13 years or more	
	Personal level of education, years	Average educational level in region, years	Personal level of education, years	Average educational level in region, years
Dependent variables				
Trust	0.0154 (0.0124)	0.2032*** (0.0506)	0.0884*** (0.130)	0.2847*** (0.0414)
Social cohesion	0.0141 (0.0128)	0.2214*** (0.0515)	0.0101 (0.0141)	0.3711*** (0.0425)
Participation in organizations	0.0906*** (0.0151)	0.0192 (0.0604)	0.1320*** (0.0133)	0.0486 0.0430
Voluntary work in NPO	-0.1563 (0.1749)	1.5923** (0.7429)	0.8234*** (0.2542)	-0.5691 (0.7975)
Age	yes		yes	
Sex	yes		yes	
Family income	yes		yes	
Regional variables	yes		yes	
N (not less than)	10 832		13 032	

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

As the table shows, the results for a group of highly educated respondents (Group 2), almost the same as the results for the sample as a whole. Significantly larger coefficient on "Personal level of education" indicates a stronger effect of higher education on the probability of trust and civic behavior. The most significant conclusion , in our opinion, is that the average level of education in the social environment is more important for less educated citizens (Group 1) than for the highly educated.

Living in highly educated community increases the likelihood of trust and the duration of voluntary work in NPO for the people who studied less than 13 years. At the same time, for highly educated individuals their personal level of education is the only factor that matters. We can conclude that additional social benefits of increasing the average level of education have the property of diminishing marginal return and total gains curve depending on the number of years of education has the standard neoclassical form. For individuals with higher education, their personal level of education compensates for the lack of education in their environment.

B. Personal Discount Rate as an Instrument for Education

These results meet the same treat as in cross-regional study – they don't prove causality. It is possible that some unobservable individual characteristics influence both educational level and trust. People with certain characteristics may choose higher educational level and trusty and civic behavior simultaneously. Therefore the coefficients on education could be a result of self-selection process. This self-selection can introduce correlation between the error term and the regressor, which leads to bias in the probit estimator.

Many studies show that individual measures of impatience predict a wide range of important personal outcomes. For example, cognitive abilities are closely connected with personal discount rates.
The main finding is that people with lower cognitive ability are significantly more risk averse and significantly more impatient. This is true controlling for personal characteristics, educational attainment, income, and liquidity constraints (Dohmen, Falk, Huffman, Sunde, 2010). So any measure of risk aversion or impatience could be a good proxy for individual unobservable characteristics.

Unfortunately in our database we don't have such measures. Instead we use the same Georating survey for 2008 which includes question about family budget planning. The question asks: "Some people keep a permanent record of their income and expenses, plan their budget. Other people do not. Do you consider yourself as a part of those who planning their budget, or those who have not?" There were four possible answers to this question. People who respond "Certainly I'm one of those who planning their budget" and "I'm rather planning than not" were coded as 1 (about 21 thousand respondents or 61% of the sample). People who respond "Certainly I'm one of those who do not plan my budget" and "I'm rather not planning than do" were coded as 0 (about 11 thousand respondents or 33.5% of the sample). We use this dummy variable as an instrument for personal educational level. The results of IV probit

regression are reported in Table 8. Controls for age, sex, family income, regional dummies included, but not reported.

Table 8. IV Regression for Trust

Panel A: Second Stage for Trust	
Education	0.130**
	(0.0530)
Pseudo Rsq	0.0275
Panel B: First Stage for Education, years	
I plan my budget	0.287***
	(0.0223)
R sq	0.1295
Observations	30 281

The results suggest that education have strong positive and statistically significant effect on trust. Estimation of marginal effects show that holding other factors fixed one additional year of education increases the probability of trust on 5%.

6. Conclusion

Education is closely linked with all the traditional dimensions of social capital. Average education level in years is the only indicator that consistently correlated with trust at the regional level. At the individual level, education is the main predictor of trust, responsibility and civic behavior. Educational level in social environment affects less educated individuals stronger than well-educated. Thus, the marginal social return on education is characterized by a decreasing function.

The results show that education produces significant positive externalities. Education of one individual positively affects the probability of trust and assessment of social cohesion from the other. Therefore, evaluation of the effectiveness of government spending on education should not only consider individual economic gain, but also non-economic impact on trust and civic behavior.

7. Discussion

The mechanism of the effect of education on social capital has been widely discussed[7]. Most authors agree that education affect trust through two channels. First, education increases the ability to analyze and interpret different information, thus reducing and information costs. For educated person it is easier to give

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[7] For a detailed review see Campbell D. (2006) What is Education's Impact on Civic and Social Engagement? In OECD's Measuring the Effects of Education on Health and Civic Engagement // www.oecd.org/edu/socialoutcomes/symposium

complex solutions across a wider range of issues. Secondly, education alters balance of benefits and costs from engaging in collective action and compliance with social norms (Glaeser, et al., 2007).

Indeed, much of the learning process is to acquire social skills. Education is not simply mastering a certain amount of information, but also learning interaction with classmates and teachers (learning cooperation). The process of socialization does not end at school, but continued on to college and university. This largely explains the existence of the university community and alumni clubs. People support long-term relations, precisely because the university was not only the place to acquire new knowledge, but also a way of building connections and social networks.

Accumulation of social capital is the result of multiple interactions in relatively small groups. In this sense, years of education in schools and universities are the best way of socialization and formation of shared mental models. Thus, education can be regarded not only as a private (human capital accumulation), but also as a public good that forms shared values and competencies, improve the efficiency community. Empirical evaluation of the relative strength of each of these channels of influence is the subject of future research in this area of economic analysis.

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Appendix

Variables	Question in Georating survey
Trust	Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?
Social cohesion	Do you think today in our country among the people to be more harmony, unity or disagreement, disunity?
Participation in organizations	Are you participate in public associations and other nonprofit organizations?
Voluntary work for NPO	How much time per month on average do you spend on voluntary work in the public and other nonprofit organizations in the last year?