



*INTER-AMERICAN DEVELOPMENT BANK
BANCO INTERAMERICANO DE DESARROLLO (BID)
RESEARCH DEPARTMENT
DEPARTAMENTO DE INVESTIGACIÓN
WORKING PAPER #684
RG-N3338*

EDUCATION AND DEMOCRATIC PREFERENCES

BY

ALBERTO CHONG*
MARK GRADSTEIN**

* INTER-AMERICAN DEVELOPMENT BANK
** BEN GURION UNIVERSITY

JUNE 2009

**Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library**

Chong, Alberto.

Education and democratic preferences / by Alberto Chong, Mark Gradstein.

p. cm. (Research Department Working Papers ; 684)
Includes bibliographical references.

1. Democracy and education. I. Gradstein, Mark. II. Inter-American Development Bank.
Research Dept. IV. Title. V. Series.

LC71 .C466 2009
370.115 C466----dc22

©2009
Inter-American Development Bank
1300 New York Avenue, N.W.
Washington, DC 20577

The views and interpretations in this document are those of the authors and should not be attributed to the Inter-American Development Bank, or to any individual acting on its behalf.

This paper may be freely reproduced provided credit is given to the Research Department, Inter-American Development Bank.

The Research Department (RES) produces a quarterly newsletter, *IDEA (Ideas for Development in the Americas)*, as well as working papers and books on diverse economic issues. To obtain a complete list of RES publications, and read or download them please visit our web site at: <http://www.iadb.org/res>.

Abstract*

This paper examines the causal link between education and democracy. Motivated by a model whereby educated individuals are in a better position to assess the effects of public policies and hence favor democracy where their opinions matter, the empirical analysis uses World Values Surveys to study the link between education and democratic attitudes. Controlling for a variety of characteristics, the paper finds that higher education levels tend to result in pro-democracy views. These results hold across countries with different levels of democracy, thus rejecting the hypothesis that indoctrination through education is an effective tool in non-democratic countries.

Keywords: Education, democracy

JEL Classifications: I20, I30, Y80

* Chong: Inter-American Development Bank. Email: albertoch@iadb.org; Gradstein: Ben Gurion University, Israel; CEPR; CESifo; IZA. Email: grade@bgu.ac.il; Vanessa Rios provided very able research assistance.

1. Introduction

Education, by fostering civic attitudes and cultivating rational informed opinions, has been commonly believed to promote pro-democracy views (Mann, 1846; Dewey, 1916). The more recent stipulation by Lipset (1959) that education is a prerequisite of a democratic society was echoed by Milton Friedman, “A stable and democratic society is impossible without a minimum degree of literacy and knowledge on the part of most citizens and without widespread acceptance of some common set of values. Education can contribute to both” (Friedman, 1962, 86). This link is often assumed in theoretical models of economic development as well. For example, Bourguignon and Verdier, 2000, stipulate that education tends to make people more critical of the prevailing autocratic regime, thus implying that investment in education by such a regime may ultimately undermine it.

Empirical work, mostly in a cross-country context, similarly documents a positive association between education and democratic institutions (Barro, 1999; Glaeser et al., 2004; Glaeser, Ponzetto and Shleifer, 2007). This literature, however, has difficulties addressing endogeneity and reverse causality. Also, there is evidence that education is positively related to measures of civic participation (Campante and Chor, 2008; Dee, 2004; Glaeser, Ponzetto and Shleifer, 2007; Milligan, Moretti and Oreopoulos, 2004).¹ A dissenting view is presented in Acemoglu et al. (2005), where, when controlling for fixed effects, education turns out to be unrelated to democracy; see, however, Bobba and Coviello (2007), for qualifications in regard to the econometric technique used.

Another important observation, in Lott (1999) is that totalitarian regimes tend to make substantial investments in education, presumably as the means of indoctrination. A theory on which this is based, more fully exposed in Lott (1990) provides a link between indoctrination through the provision of public schooling and regime legitimacy. Spilimbergo (2008) finds that education acquired in foreign countries promotes democracy domestically, provided that the foreign country is democratic; when the foreign country is non-democratic, no effect is detected.

In this paper, we make use of international survey data to revisit the relationship between education and pro-democracy opinions. To shape ideas, consider the following two views that emerge from the literature discussed above. One view emphasizes indoctrination, seeing

¹ An issue here is that civic participation cannot be readily interpreted as being necessarily pro-democratic—think of neo-Nazi rallies, for example.

education as a means of promoting attitudes. Then the ultimate effect on democratic disposition depends on the values instilled, which may well differ between democracies and non-democracies: while the former may promote pro-democratic views, the latter may indoctrinate against such views. An alternative theory, formally developed in the paper, is that education reduces the cost of acquiring an informed opinion, needed to assess public policies. In this case, education's effect on pro-democracy views is positive independently of the regime type, as educated individuals have a comparative advantage under democracy in being able to affect policies.² Thus, while both theories generate a positive effect of education on pro-democracy attitudes under democracies, their predictions on this relationship in non-democratic regimes differ.

We contribute to the understanding of these issues by first formalizing the idea, often put forward by educators, that education delivers informational benefits relevant for democracy. To this end, we provide an analytical framework where better judgmental capacity, assumed to be correlated with education, leads to better policy choices. Consequently, better-educated individuals have a comparative advantage in a democracy, where popular voice plays a role. In the model, this mechanism ensures that education leads to pro-democracy attitudes.

We then examine the World Values Surveys data, which contain detailed questions about democratic preferences. We find that education is correlated with these preferences even after controlling for a variety of personal characteristics. Although reverse causality is much less of an issue here than in cross-country settings, and despite employing a relatively rich set of personal characteristics as controls, we also use instrumental variables to primarily address possibly omitted variables. The results reaffirm the positive effect of education on pro-democratic attitudes. Further, we find that this relationship holds across both democracies and non-democracies. In other words, a country's level of democracy, when interacted with the level of schooling, turns out to be statistically insignificant, contrary to the theory of Lott (1990) that educated individuals in non-democratic countries, being subject to intense indoctrination, may be less supportive of democracy than less educated individuals.

The paper proceeds as follows. The next section presents our analytical framework. The data and empirical strategy are discussed in Section 3. Our main empirical results are contained in Section 4, and Section 5 concludes.

² This theory is consistent with the view presented in the opening paragraph above.

2. Analytical Framework

2.1. The Model

Consider an economy populated with a continuum of citizens of a unit measure, and a ruler; the role of the latter is to implement public projects. The population of individual citizens forms a legislature. The citizens are initially endowed with identical incomes normalized to zero.³ A potent ruler expropriates the individuals' income and provides a public good. We let e denote the amount of expropriation and b the net benefit from the public good accrued to every citizen.⁴ The benefit is assumed to be ex ante unknown and distributed according to the distribution $F(b)$ and lies in the interval $[0, \infty)$.

The status quo refers to the situation where there is no public good and no expropriation, in which $b=e=0$. We assume for analytical simplicity that the utilities are linear. The utilities of the citizens and the ruler can then respectively be written as follows:

$$U = (-e + b)\Delta \quad (1)$$

and

$$R = e \Delta \quad (2)$$

where $\Delta=1$ if the ruler is potent, and $\Delta=0$ if she is blocked and the status quo prevails. Note that under the first best outcome and without strategic distortions, the public good is provided, and the aggregate surplus is b .

The level of democracy, denoted v , is the probability of holding the ruler accountable; $1-v$ is the probability with which the ruler acts autonomously. In the latter case, the public project is implemented and expropriation takes place. In the former case, the ruler submits a proposal on whether to carry the project out and on the amount of expropriation. The project goes through if approved by the legislature, but if it is blocked then the status quo prevails.

Maintaining a given accountability level is assumed costly for the citizens, and this cost differs in relation to their education levels. The idea is that more accountability requires maintaining and processing of diverse sources of information as well as a high level of public discourse, the costs of which are smaller for educated people.

³ We will discuss extensions to heterogeneous agents later.

⁴ This refers both to pure public goods and to private goods that for a variety of reasons are state provided, such as education. We will refer to all these cases, slightly abusing the terminology, as public goods or public projects.

In particular, the accountability cost function is $C(h_i, \nu) = c(h_i)\nu^2/2$, $c' < 0$, $0 \leq \nu \leq 1$, where h_i is individual i 's education, and the assumption on c ensures that better educated individuals incur a lower cost for a given level of accountability.

In the first stage, individuals set the level of accountability ν . Then, with the probability $1-\nu$ the ruler's proposal is implemented, whereas with the probability ν it undergoes a review by the legislature and can be either approved or blocked. We study the subgame perfect equilibria of the resulting game.

2.2. Analysis

Proceeding backwards, we first examine when the ruler's proposal is approved. This will be the case when the citizens' utility under the proposal exceeds the status quo level, or when $-e + b > 0$. It then follows that the realization of the value of the public project that makes the citizens just indifferent between approving the proposal and rejecting it is $b = e$, and the resulting probabilities of its rejection and approval, respectively, are $F(e)$ and $1-F(e)$.

For a given level of accountability, the ruler's expected utility is

$$ER = (1-\nu)e + \nu \int_e^{\infty} e dF(b) = e - \nu e F(e)$$

and its maximization with respect to e yields the first order condition

$$1 - \nu(F + eF') = 0$$

that determines the amount of expropriation proposed by the ruler; differentiation reveals that it decreases in ν .

We then write the citizens' expected utility as follows:

$$EU_i(\nu) = -c(h_i)\nu^2/2 + (1-\nu) \int_0^{\infty} (b-e) dF(b) + \nu \int_e^{\infty} (b-e) dF(b) \quad (3)$$

Its differentiation yields the first order condition for the favored level of political accountability by citizen i :⁵

⁵ Internal solutions are assumed throughout.

$$\begin{aligned}
& -c(h_i)v - \int_0^{\infty} (b-e)dF(b) + \int_e^{\infty} (b-e)dF(b) - [1-v+v(1-F(e))]de/dv = \\
& -c(h_i)v + \int_0^e (e-b)dF(b) = -c(h_i)v + F(e) - [1-vF(e)]de/dv = 0
\end{aligned} \tag{4}$$

and the second order condition is assumed to hold. Equation (4) implicitly determines $v(h_i)$, and its total differentiation reveals that $\partial v(h_i)/\partial h_i > 0$, implying that higher education implies increased preference for political accountability.

Suppose now that a reduced form version of a political process is used to determine the accountability level, whereby a weighted function of individual utilities, $\int \omega(h_i)U_i di$, is maximized. We then let h_d denote the education level of the decisive individual and the first order condition is

$$-c(h_d)v + F(e) - [1-vF(e)]de/dv = 0$$

and total differentiation yields that the more educated the decisive individual the higher is the equilibrium level of accountability.

Summarizing,

Proposition 1. Education is positively associated with individual pro-democracy views and with collective support for democracy.

2.3. Education, Policy Assessment, and Pro-Democracy Attitudes

Rulers often use deception, manipulating information to influence citizens' attitudes in order, for example, to affect their voting behavior. This phenomenon may exist in both democratic and non-democratic settings, although Lott (1990, 1999) suggests that it may be particularly relevant in the latter. To illustrate how this may work, suppose now that the population is divided into educated and uneducated citizenry, and let μ denote the fraction of the former. The public good is parameterized with q , its quality, so that the distribution of benefits, $F(q,b)$, $F_q > 0$, shifts rightwards with an increase in q , which is assumed to be privately known to the ruler.

In the first stage, the ruler sends a message $m(q)$ about the true value of q , bearing a cost of deception that increases in the deviation from the true value, $\phi(m-q)^2/2$, $\phi > 0$.⁶ This cost captures, in particular, social disapproval in case deception is revealed, as well as the resources needed for excessive manipulation of information. The difference between the educated and the uneducated individuals is that, while the former behave in a Bayesian manner, critically evaluating the message and forming posterior beliefs about the true value, the latter individuals are naïve and simply believe the message. To focus on this difference, we now assume that all individuals share equally in the cost of maintaining accountability, $c(h_i) = 1$. To further simplify, we assume that the amount of the ruler's expropriation, e , is given.⁷

We will employ the fact that the above game is a special case of the one studied in Kartik, Ottaviana and Squintani (2007). As in that paper, we focus on separating perfect Bayesian Nash equilibria. Adopted to this context, such an equilibrium is defined by educated individuals' beliefs formed under Bayes' rule and the ruler's message that maximizes her utility given these beliefs and correctly anticipating individuals' decisions.

The analysis proceeds backwards. The approval rule of the ruler's proposal by the citizens is as before, and it is approved when $b > e$. We then write the individual utilities as follows:

$$EU_i(v) = -v + (1-v) \int_0^{\infty} (b-e) dF_i(Q_i(m), b) + v \int_e^{\infty} (b-e) dF(Q_i(m), b) \quad (5)$$

where $Q_i(m)$ are individual i 's beliefs and $F(Q_i(m), b)$ is individual i 's assessment of the distribution of benefits under these beliefs. Differentiating, we obtain the first order condition for the preferred level of accountability by individual i :

$$-v - \int_0^{\infty} (b-e) dF(Q_i(m), b) + \int_e^{\infty} (b-e) dF(Q_i(m), b) = 0 \quad (6)$$

Recall that uneducated individuals naively believe the message m ; Kartik, Ottaviana and Squintani (2007) show that in equilibrium, Bayesian individuals correctly invert the message, deducing the true value q . Thus, $Q_i(m(q)) = m$ if i is uneducated, and $Q_i(m(q)) = q$ if i is educated. Further, differentiation of (6) reveals that the preferred level of accountability is a decreasing function of the perceived quality of the public good, $dv/dQ_i < 0$.

⁶ This assumption is stronger than needed.

⁷ This does not affect any of the qualitative results.

Letting $\omega(\mu)$ be the relative weight of the fraction of educated individuals, an increasing function, we write the first order condition for the collective choice of accountability:

$$-v + \omega(\mu) \left[- \int_0^{\infty} (b-e) dF(q,b) + \int_e^{\infty} (b-e) dF(q,b) \right] + \\ (1-\omega(\mu)) \left[- \int_0^{\infty} (b-e) dF(m,b) + \int_e^{\infty} (b-e) dF(m,b) \right] = 0 \quad (7)$$

and total differentiation reveals that $dv/dm < 0$ and that $dv^2/dmd\mu > 0$. Thus, accountability decreases with the level of the message, but less so the greater is the fraction of educated individuals.

We now employ the fact (see Theorem 1 in Kartik, Ottaviani and Squintani, 2007) that there is a unique separating equilibrium, with $m(q)$ strictly increasing; we then write the utility of the ruler when issuing a message m whereas the true value is q as follows:

$$ER(m,q) = -\phi(m-q)^2/2 + \omega(\mu) \left[(1-v(q))e + v(q) \int_e^{\infty} e dF(q,b) \right] + \\ (1-\omega(\mu)) \left[(1-v(m))e + v(m) \int_e^{\infty} e dF(q,b) \right] = -\phi(m-q)^2 + e - \omega(\mu) v(q)eF(q,e) - \\ (1-\omega(\mu))v(m)(1-F(q,e)) \quad (8)$$

where $\omega(\mu)$ is the relative weight of the fraction of educated individuals, which is an increasing function.

The first order condition for the equilibrium message is

$$-\phi(m-q) - (1-\omega(\mu))(dv(m)/dm)(1-F(q,b)) = 0 \quad (9)$$

and the second order condition holds. Note that, since $dv(m)/dm < 0$, $m > q$, so that the ruler's message is always exaggerated. Further, totally differentiating (8) we obtain that $dm/d\mu < 0$, so that the extent of exaggeration is a declining function of the fraction of educated individuals.

Summarizing these results,

Proposition 2. In equilibrium, the ruler's message about the public good's quality is exaggerated, with the extent of exaggeration decreasing in the fraction of educated individuals. Educated individuals favor a higher level of accountability than do uneducated ones, so that the

equilibrium level of accountability is an increasing function of the fraction of educated individuals.

These results complement those of the previous sub-section in indicating that educated individuals have a comparative advantage in making policy inferences under democracy, even when subject to manipulation. Education, again, is seen to promote democratic preferences, which also has implications for the collective choice, so that democracy is more likely to emerge the more educated society is. In this sense, the model results are fully consistent with the sentiments by prominent commentators cited above.

3. Data and Empirical Strategy

In order to test the empirical implications of the theoretical model, we use the following benchmark specification:

$$Democracy_{ij} = \beta Schooling_{ij} + \gamma X_{ij} + \lambda Z_j + u_{ij} \quad (10)$$

In this equation, *Democracy* is the dependent variable and represents the preference for democracy by individual *i* in country *j*. According to the model presented above, we focus on education of individuals as our main variable of interest (*Schooling*). We also include vector *X* that represents additional individual-level explanatory variables, vector *Z* that represents country and year dummies, and *u_{ij}* that represents the error term. Thus, we estimate the coefficients β , γ , and λ where the latter two are vectors.

The data come from the World Value Survey (WVS), which is a worldwide survey carried out by the Inter-University Consortium for Political and Social Research (ICPSR) that comprises individual cross-national questions on a wide variety of topics, such as the economy, politics, foreign policy, and identity, as well as on the socio-economic background of individual respondents and his or her attitudes on several topics. Data come from in-person interviews of a sampling universe of adult citizens 15 years old and older from different developed and developing countries around the world. For our purposes, as we need specific variables related to democracy, our sample is composed of around 240,000 individuals (from 85 countries) that were surveyed during the so-called third, fourth and fifth waves, between 1994 and 2008.⁸

⁸ The countries along with their respective samples and the wave in which was executed the survey are presented in Appendix 1.

As measures of our dependent variable, democracy, we use a broad set of proxies. The first one is included in the three waves and is regarded as our preferred measure. It answers the question: “Would you say having a democratic political system is a very good, fairly good, fairly bad or very bad way of governing this country?” The other three proxies considered are included in the third and fourth waves only, showing individuals’ agreement, on a scale of 1 to 4, with the following statements: (i) “In democracy economic system does not run badly”; (ii) “Democracies are good at maintaining order”; and (iii) “Democracy may have problems but is better”. For the sake of completeness we use another proxy that is included in the fifth wave only. On a scale from 1 to 10, this variable answers the question: “How important is it for you to live in a country that is governed democratically?” The five proxies used are described in detail in Table 1. They are all categorical variables, and, consequently, the coefficients are estimated using ordered probits.⁹

As mentioned above, the most important explanatory variable is years of schooling of individuals. We transform the available categorical variable into pseudo years of education according to each level attained. Along with our variable of interest, the other explanatory variables included in the benchmark specification are the following: age, a dummy variable for gender that equals one for women, a dummy variable for marital status that equals one for being single, two dummy variables for employment status: employed, and unemployed; a dummy variable that equals one when the individuals live with their parents, and a scale of income on which the individuals’ household is located according to their perception.¹⁰

We also use other control variables that are not included in the benchmark specification because they significantly reduce the sample. These variables are the following: a categorical variable that represents the size of the town of residence, the perceived degree of respect for individual human rights in the respondent’s country, and self-positioning on a political scale (from left to right). In other regressions, we add to the benchmark specification variables related to individuals’ satisfaction with democracy in their own countries. One variable directly addresses dissatisfaction with the development of democracy in the respondent’s country (third and fourth wave), and the other asks how democratically the respondent’s country is being

⁹ Ordinary least squares were also estimated, and results are analogous.

¹⁰ For more details about the definition of these and the following variables presented in this section, see Table 1.

governed (fifth wave). Summary statistics of these variables and those described in the preceding paragraph are presented in Table 2.

Additionally, all estimations include country and year dummies, have robust standard errors, and are clustered by the country and wave in which the survey was executed. Table 3 presents a correlation matrix between all our proxies of *Democracy* and the explanatory variables, with corresponding *p*-values of the coefficients.

Additionally, for illustrative purposes Figure 1 presents the average years of schooling of people that approve and disapprove democracy, using our five proxies, by region (as classified by the World Bank). It appears that, across regions, less educated people favor democracy less than do more educated people.

4. Regression Results

In Table 4, we present the results of ordered probit regressions using the approval of a democratic system as our dependent variable. The first column presents our main results using the benchmark specification, and the other columns use the additional explanatory variables as explained above. In the four regressions presented, schooling yields a positive statistically significant coefficient at one percent. Additionally, being older and male, whether employed or unemployed (compared to students, retired and housewives) seems to have a robust negative and statistically significant effect on the dependent variable. In the second column, results show that residents of large towns and individuals maintaining that human rights are respected in their country are more likely to approve of democracy.

The corresponding marginal effects of these coefficients are presented in Table 5. For the sake of economy we only show the change of an average individual in the sample who believes that it is fairly good to have a democratic system.¹¹ In the first column, one more year of schooling implies that the probability of perceiving a democratic system as good (not just fairly good) is estimated to increase by 1.2 percentage points. This magnitude is very similar in the other columns, with an increase of between 1.1 and 1.4 percentage points.

In the last four columns of Table 4 we evaluate the effects of the perception of democracy and its interaction with education on the preference for democracy. Individuals not satisfied with

¹¹ Summary statistics presented in Table 2 show that the mean of the variable “Approval of a democratic political system” is 3.

the way democracy develops in their country approve less of democracy (columns 3 and 4), and those who think that their government is more democratic approve of it more than otherwise (columns 5 and 6). We also add interactive terms between education and democracy, and they yield coefficients that are not statistically significant at conventional levels. This result implies that the effect on pro-democracy views is positive independently of the type of regime. This is fully consistent with our theoretical model that argues that the informative benefits of education are universal across regimes and is not consistent with the implication of Lott (1990) implication that totalitarian regimes successfully use education to indoctrinate citizens into supporting the regime.

To further address this issue, in Table 6 we provide results based on dividing the sample into two sub-samples, employing the countries' average democracy level to this end. In particular, in order to estimate the cut-off point used to divide the sample, we use the mean of the Democratic Accountability variable of the International Country Risk Guide (ICRG). Unlike our previously used proxy, this variable is available at the country level only. However, it is not based on the perception on the individual, but on an exogenous (albeit still subjective) assessment of the extent to which a country is democratic.¹² Our results show that in both types of countries, the more democratic and the less democratic, the effects of education on the preference for democracy are statistically significant, although its coefficient is somewhat smaller in the latter case. In Appendix 2, we execute the same exercise for a smaller subsample of the least democratic countries, and the results still hold, although the education coefficient further drops, indicating that education predicts pro-democratic attitudes in non-democracies, but somewhat less well than in democracies.¹³

The coefficients resulting from the regressions using the other four *Democracy* proxies available are presented in Table 7, and the marginal effects are shown in Appendix 4. The coefficients for our variable of interest are again positive and statistically significant at one percent. With respect to the other explanatory variables, we find that older individuals tend to agree with the idea that democracy may have problems but is better than the alternative (column 3) and that living in a country governed democratically is important (column 4); but they tend to

¹² Using the median instead of the mean does not change our findings. Similarly, we also used Polity V instead of ICRG and our results are qualitatively identical. These additional results are available upon request.

¹³ Appendix 3 shows the results of dividing the sample at the individual level, by using the same democracy variable employed in the interactions presented in Tables 4 and 5. The results are very similar.

disagree with the idea that democracies are good at maintaining order (column 2). As in Table 4, being a male or belonging to a higher income level has a positive and statistically significant effect on pro-democracy preferences.

We find that the coefficient of the town size is positive and statistically significant in two of the four regressions presented in Table 7. Living in countries where individuals perceive that there is more respect of human rights, or that democracy is sufficiently developed, again has a statistically significant and positive effect.

Endogeneity may be an issue of concern, primarily because of potentially omitted variables. (Notice that, as we deal with democratic attitudes, reverse causality is unlikely here.) To address this issue, Tables 8 and 9 present our findings using instrumental variables (IV). In both tables we use (i) the savings of the respondent's family during the previous year and (ii) the respondent's number of children as instrumental variables. These instruments appear to be sensitive. Income and thus savings are typically positively correlated with education; however, there is no reason to expect that level of savings may be linked in a consistent way with democratic perceptions. Similarly, while one would expect a negative correlation between the number of children and the individual's education level, the former is unlikely to be directly correlated with democratic perceptions.¹⁴

In Table 8 we present the benchmark specification of Table 4 as well as an additional specification that includes additional explanatory variables (but reduces the sample size dramatically). This table also includes the marginal effects of a change from the mean, in this case, the probability increase of being in category 4 (thinking that having a democratic political system is a very good way of governing the country). In both regressions the effect of schooling on preference for democracy is the same as before: a coefficient that is positive and statistically significant at conventional levels. The marginal effect of education is somewhat smaller than the one without instrumental variables. The probability of the belief that having a democratic political system is good, not just fairly good, increases by 1.3 and 1.2 percentage points, in columns 2 and 4, respectively. From the last row of this table, which presents the corresponding p-value significance of both instruments, it is seen that they are statistically significant.¹⁵

¹⁴ China may be considered an outlier. When excluding this country from our sample our results do not change.

¹⁵ Also, corresponding tests of exclusion restrictions show that the instruments employed are good ones.

In Table 9 we present the results of the benchmark specification using the other four proxies of *Democracy*. We also include in this table the marginal effects. The education coefficient is positive and statistically significant, and the marginal effects are smaller but also result statistically significant. The first stage regressions of Table 8 and 9 are presented in Appendix 5. In those regressions the corresponding coefficients have the expected signs: less educated individuals have a larger number of children than more educated ones; and families of less educated individuals just get by or spend savings.

5. Concluding Remarks

The relationship between education and democracy has been a long standing subject of interest, both theoretically and empirically. Influential commentators have suggested mechanisms through which education may promote democracy, and the link between the two has been well documented in the recent literature. Discerning the causal impact of education, however, has proved difficult because of endogeneity issues. Further, suggestions have been made that education may promote democracy under democratic regimes only, whereas in non-democratic setting the effect might reverse itself.

In this paper, therefore, we attempt to make a twofold contribution. Using rich survey data, we study whether education promotes pro-democratic preferences; and whether this effect differs across countries with different levels of democracy. Our theoretical model, formalizing the sentiment that education confers informational advantages, essential for democracy, suggests that educated individuals have a comparative advantage in a democracy in translating their (better) judgment of public policies into action. This informational advantage emerges even when the ruler uses deception to misinform the population in order to tilt outcomes to his own advantage. Consequently, the educated favor democracy more than less educated individuals.

The empirical part tests the main implications of our analysis using individual level data from across the globe. We find a positive effect of education on pro-democratic attitudes, using a variety of proxies for the latter, personal characteristics as controls, and also addressing endogeneity issues. For example, one more year of schooling implies an increase in the likelihood of perceiving a democratic system as good, as opposed to fairly good, by more than one percentage point. Moreover, the effect exists regardless of a country's level of democracy,

suggesting that the possible use of education for indoctrination purposes in non-democratic environments may have limited consequences.

Based on survey data, this research complements previous efforts that find a positive effect of education on measures of civic participation. Whereas the latter are often interpreted as being correlated with democracy, the relationship is not straightforward, as one could imagine social activities whose nature is precisely anti-democratic. In this sense, findings presented here offer yet another, and one that is perhaps more direct, on how education may affect democracy. Additionally, this study questions the view that education promotes democratic views only under democracies, as the effect identified here appears to hold universally. We view this second result as casting doubt on the indoctrinating potential of education in non-democratic settings.

In future work, it would be interesting to disintegrate the analysis by the respondent's occupation and sector of employment. This has the potential of relating the link between education and democratic preferences to the respondents' affiliation with the governing regime. For instance, bureaucrats, army officers, and governing party members in non-democratic environments may exhibit preference that depend more on their occupation and employment than on education.

References

- Acemoglu, D. et al. 2005. "From Education to Democracy." *American Economic Review* 95: 44-49.
- Barro, R.J. 1999. "The Determinants of Democracy." *Journal of Political Economy* 107: S158-S183.
- Bobba, M., and D. Coviello. 2007. "Weak Instruments and Weak Identification in Estimating the Effects of Education on Democracy." *Economic Letters* 96: 301-307.
- Bourguignon, F., and T. Verdier. 2000. "Oligarchy, Democracy, Inequality and Growth." *Journal of Development Economics* 62: 285-313.
- Brady, H.E., S. Verba and K. L. Schlozman. 1995. "Beyond SES: A Resource Model of Political Participation." *American Political Science Review* 89: 271-294.
- Campante, F., and D. Chor. 2008. "Schooling and Political Participation in a Neoclassical Framework," mimeo.
- Dee, T. 2004. "Are There Civic Returns to Education?" *Journal of Public Economics* 88: 1697-1720.
- Dewey, J. 1916. *Democracy and Education*. New York, United States: The Macmillan Company.
- Friedman, M. 1962. *Capitalism and Freedom*. Chicago, United States: University of Chicago Press.
- Glaeser, E. et al. 2004. "Do Institutions Cause Growth?" *Journal of Economic Growth* 9: 271-303.
- Glaeser, E., G. Ponzetto, and A. Shleifer. 2007. "Why Does Democracy Need Education?" *Journal of Economic Growth* 12: 77-99.
- Kartik, N., M. Ottaviani and F. Squintani. 2007. "Credulity, Lies, and Costly Talk." *Journal of Economic Theory* 134: 93-116.
- La Porta, R. et al. 1999. "The Quality of Government." *Journal of Law, Economics and Organization* 15: 222-279.
- Lipset, S. 1959. "Some Social Requisites of Democracy: Economic Development and Political Legitimacy." *American Political Science Review* 53: 69-105.
- Lott, J.R. Jr., 1990. "An Explanation for Public Provision of Schooling: The Importance of Indoctrination." *Journal of Law and Economics* 33: 199-232.

- . 1999. "Public Schooling, Indoctrination, and Totalitarianism." *Journal of Political Economy* 107(6/Part 2): S127-S157.
- Mann, H. 1846. *Tenth Annual Report of the Secretary of the Massachusetts State Board of Education*. Boston: Horace B. Fuller.
- Milligan, K., E. Moretti, and P. Oreopoulos. 2004. "Does Education Improve Citizenship? Evidence from the United States and the United Kingdom." *Journal of Public Economics* 88: 1667-1695.
- Spilimbergo, A. 2008. "Democracy and Foreign Students." London, United Kingdom: Centre for Economic Policy Research. Available at <http://antoniospilimbergo.com/research.htm>.
Forthcoming in *American Economic Review*.

Figure 1. Schooling and Approval of Democracy

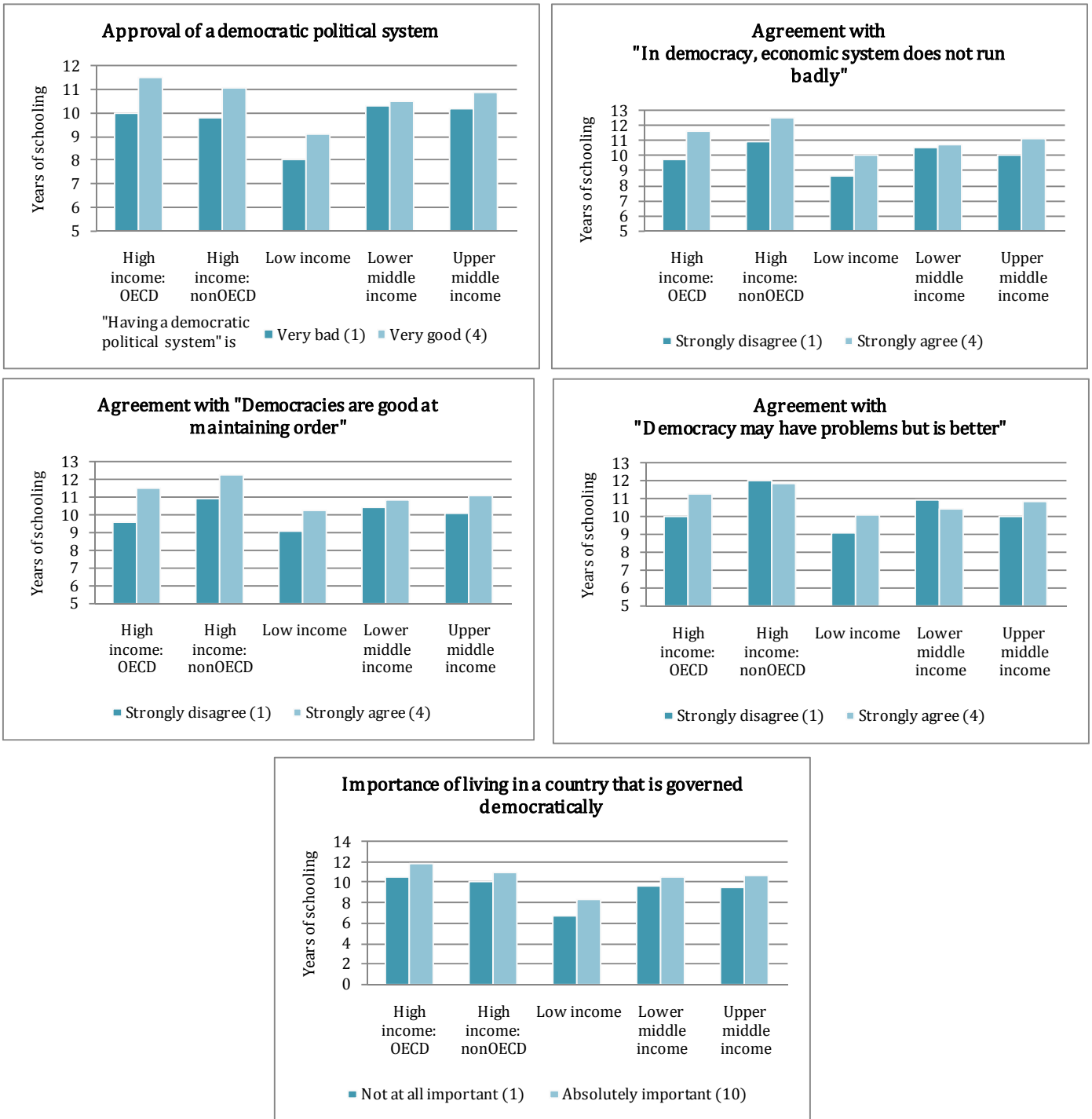


Table 1. Variables Description

Variable	Description
Individual Level Variables	
Approval of a democratic political system	The question in the survey is as follows: Would you say it is a (1) very good, (2) fairly good, (3) bad or (4) very bad way of governing this country having a democratic political system. This variable scale was changed to: (1) very bad – (4) very good. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Agreement with opinion that says that in democracy economic system does not run badly	The question in the survey is: Could you please tell me if you (1) agree strongly, (2) agree, (3) disagree or (4) strongly disagree with this statement “In democracy economic system runs badly”. Source: World Value Surveys (Third and Fourth Waves).
Agreement with opinion that says that democracies are good at maintaining order	The question in the survey is: Could you please tell me if you (1) agree strongly, (2) agree, (3) disagree or (4) strongly disagree with this statement “Democracies aren’t good at maintaining order”. Source: World Value Surveys (Third and Fourth Waves).
Agreement with the opinion that says that democracy may have problems but is better	The question in the survey is: Could you please tell me if you (1) agree strongly, (2) agree, (3) disagree or (4) strongly disagree with this statement “Democracy may have problems but is better than any other form of government”. This variable scale was changed to: (1) strongly disagree – (4) agree strongly. Source: World Value Surveys (Third and Fourth Waves).
Importance of living in a country that is governed democratically	The question in the survey is: How important is it for you to live in a country that is governed democratically? On this scale where 1 means “it is not important at all” and 10 means “absolutely important”. Source: World Value Surveys (Fifth Wave).
Schooling	The exact question in the survey is: What is the highest educational level that you have attained? (1) Inadequately completed elementary education, (2) Completed (compulsory) elementary education, (3) Incomplete secondary school: technical/vocational type, (4) Complete secondary school: technical/vocational type, (5) Incomplete secondary: university-preparatory, (6) Complete secondary: university-preparatory, (7) Some university without degree/higher education, (8) University with degree/higher education. This variable was changed to one with pseudo years of education, according to each level: To (1) we assigned 3 years of schooling; to (2), 6; to (3), 8.5; to (4), 11; to (5), 12.5; to (6), 14; to (7), 13.5; and to (8), 16. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Age	Respondent’s age. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Gender	Gender of the respondent. (1) Female and (0) Male. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Marital status	2 dummies: (1) Married, living together as married, divorced, separated or widowed, and (2) Single. In all the regressions (1) is the omitted dummy. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Employment status	Employment status composed of 3 dummies: (1) Employed (Part or full time) and Self-employed; (2) Retired/pensioned, Housewife not otherwise employed, and Student; and (3) Unemployed. In all the regressions, dummy (2) is omitted. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Scale of income	A scale of incomes in which the household falls into, before taxes and other deductions. This variable takes values from 1 to 10, 1 being the lowest decile and 10 the highest. The data is recollected in local currency, scaled and then aggregated so the deciles represent a country level income ranking. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Size of town	Categorical variable: (1) Under 2,000; (2) 2-5,000; (3) 5-10,000; (4) 10-20,000; (5) 20-50,000; (6) 50-100,000; (7) 100-500,000; and (8) 500,000 and more. Source: World Value Surveys (Third, Fourth and Fifth Waves).

Variable	Description
Respect of human rights in own country	The question in the survey is: How much respect is there for individual human rights nowadays in this country? Do you feel there is: (1) A great deal of respect for individual rights, (2) Fairly much respect, (3) Not much respect, and (4) No respect at all. This variable scale was changed to: (1) No respect at all – (4) A great deal of respect (...). Source: World Value Surveys (Third, Fourth and Fifth Waves).
Self positioning in political scale	How the respondent place his/her views on the scale from (1) Left to (10) Right. Source: World Value Surveys (Third, Fourth and Fifth Waves).
No satisfaction with the way democracy develops	The question in the survey is: On the whole are you very satisfied, not very satisfied or not at all satisfied with the way democracy is developing in our country? (1) Very satisfied, (2) Rather satisfied, (3) Not very satisfied, and (4) Not at all satisfied. Source: World Value Surveys (Third and Fourth Waves).
Democracy in own country	The question in the survey is: How democratically is this country being governed today? Again using a scale from 1 to 10, where 1 means it is “not at all democratic” and 10 means that it is “completely democratic”, what position you use? Source: World Value Surveys (Fifth Wave).
Number of children	Number of children, where 0 means no children. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Savings	4 dummies that answer to the question: During the past year, did your family: (1) Save money, (2) Just get by, (3) Spent some savings, and (4) Spent savings and borrowed money. The omitted category is the first one. Source: World Value Surveys (Third, Fourth and Fifth Waves).
Country Level Variables	
Democratic Accountability	This is a measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one. Average for five years, including the year when the individual was surveyed. Source: ICRG.

Table 2. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Approval of a democratic political system	168,542	3.3660	0.7219	1	4
Agreement with opinion that says that in democracy economic system does not run badly	99,476	2.7430	0.7914	1	4
Agreement with opinion that says that democracies are good at maintaining order	101,648	2.7352	0.8124	1	4
Agreement with the opinion that says that democracy may have problems but is better	103,346	3.2669	0.7353	1	4
Importance of living in a country that is governed democratically	49,204	8.6028	1.9138	1	10
Schooling	168,542	10.6126	4.1992	3	16
Age	168,542	40.7457	15.8711	15	99
Gender: Female	168,542	0.5026	0.5000	0	1
Marital Status: Single	168,542	0.2485	0.4321	0	1
Living with her parents	168,542	0.2727	0.4453	0	1
Employment status: Employed	168,542	0.5428	0.4982	0	1
Employment status: Unemployed	168,542	0.0924	0.2896	0	1
Scale of income	168,542	4.6327	2.4031	1	10
Size of town	118,529	4.9526	2.4838	1	8
Respect of human rights in own country	125,978	2.5779	0.8752	1	4
Self-positioning in political scale	129,160	5.6894	2.3777	1	10
Satisfaction with the way democracy develops	71,819	2.4111	0.8322	1	4
Democracy in own country	45,647	6.4195	2.4270	1	10
Savings: Family saved money	132,582	0.2388	0.4264	0	1
Savings: Family just got by	132,582	0.4910	0.4999	0	1
Savings: Family spent some savings	132,582	0.1469	0.3540	0	1
Savings: Family spent savings and borrowed money	132,582	0.1234	0.3288	0	1
Number of children	162,544	1.9154	1.7958	0	20

Table 3. Correlation between Individual-Level Variables and Preference for Democracy

	Approval of a democratic political system	Agreement with opinion that says that in democracy economic system does not run badly	Agreement with opinion that says that democracies are good at maintaining order	Agreement with the opinion that says that democracy may have problems but is better	Importance of living in a country that is governed democratically
Schooling	0.038 0.000	0.0857 0.000	0.0802 0.000	0.026 0.000	0.0733 0.000
Age	-0.0067 0.006	-0.0097 0.002	-0.0393 0.000	0.0342 0.000	0.0521 0.000
Gender: Female	-0.0386 0.000	-0.0437 0.000	-0.026 0.000	-0.0254 0.000	-0.0111 0.013
Marital Status: Single	0.0239 0.000	0.0168 0.000	0.028 0.000	-0.0085 0.006	-0.0111 0.014
Living with her parents	0.0074 0.002	-0.017 0.000	-0.0027 0.382	-0.0159 0.000	-0.0534 0.000
Employment status: Employed	0.0164 0.000	0.0491 0.000	0.047 0.000	0.014 0.000	0.0145 0.001
Employment status: Unemployed	-0.0174 0.000	-0.0423 0.000	-0.0245 0.000	-0.0228 0.000	-0.035 0.000
Scale of income	0.0693 0.000	0.1213 0.000	0.1033 0.000	0.0508 0.000	0.0624 0.000
Size of town	0.0173 0.000	0.0185 0.000	0.0206 0.000	0.0138 0.000	0.0654 0.000
Respect of human rights in own country	0.1371 0.000	0.1282 0.000	0.1389 0.000	0.1208 0.000	0.0988 0.000
Self-positioning in political scale	0.0041 0.138	0.0115 0.001	-0.006 0.087	0.0296 0.000	0.0389 0.000
Satisfaction with the way democracy develops	0.2169 0.000	0.1581 0.000	0.1657 0.000	0.1632 0.000	-
Democracy in own country	0.1024 0.000	-	-	-	0.2332 0.000

Table 4. Schooling and Approval of a Democratic Political System (Coefficients)

	Ordered Probit Regressions (Coefficients)					
	Dependent variable: Approval of a democratic political system					
	(1)	(2)	(3)	(4)	(5)	(6)
Schooling	0.030*** (0.002)	0.036*** (0.003)	0.035*** (0.004)	0.048*** (0.014)	0.026*** (0.004)	0.020*** (0.006)
Age	0.004*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Gender: Female	-0.068*** (0.009)	-0.069*** (0.012)	-0.081*** (0.015)	-0.082*** (0.015)	-0.044*** (0.014)	-0.043*** (0.014)
Marital Status: Single	0.023* (0.012)	0.022 (0.017)	0.017 (0.017)	0.017 (0.017)	0.008 (0.022)	0.008 (0.022)
Living with her parents	-0.007 (0.013)	-0.023 (0.018)	-0.009 (0.020)	-0.009 (0.021)	0.005 (0.024)	0.005 (0.024)
Employment status: Employed	-0.008 (0.011)	-0.043*** (0.016)	-0.031** (0.016)	-0.032** (0.016)	-0.016 (0.020)	-0.016 (0.020)
Employment status: Unemployed	-0.042** (0.017)	-0.076*** (0.023)	-0.084*** (0.023)	-0.084*** (0.023)	-0.000 (0.027)	-0.000 (0.027)
Scale of income	0.017*** (0.004)	0.017*** (0.004)	0.017*** (0.004)	0.017*** (0.004)	0.005 (0.007)	0.005 (0.007)
Size of town		0.009** (0.004)				
Respect of human rights in own country		0.153*** (0.019)				
Self-positioning in political scale		0.006 (0.007)				
Satisfaction with the way democracy develops			0.213*** (0.027)	0.271*** (0.067)		
Satisfaction with the way democracy develops *				-0.006 (0.005)		
Schooling Democracy in own country					0.049*** (0.009)	0.038*** (0.014)
Democracy in own country *						0.001 (0.001)
Schooling						
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	No	No	No	No	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Waves	3, 4, 5	3, 4, 5	3,4	3,4	5	5
Observations	168,542	66,661	71,819	71,819	45,647	45,647
Number of Country Waves (clusters)	140	80	67	67	37	37
Pseudo R2	0.0642	0.0776	0.0780	0.0781	0.0581	0.0581

Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. The row called “Waves” specifies the survey waves included in the sample. In column (1), for example, the regression only includes the 3rd, 4th and 5th waves of the survey. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Schooling and Approval of a Democratic Political System (Marginal Effects)

	Ordered Probit Regressions (Marginal Effects, =4)			
	Dependent variable: Approval of a democratic political system			
	(1)	(2)	(3)	(5)
Schooling	0.012*** (0.001)	0.014*** (0.001)	0.014*** (0.002)	0.011*** (0.001)
Age	0.002*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)
Gender: Female	-0.027*** (0.003)	-0.027*** (0.005)	-0.032*** (0.006)	-0.017*** (0.006)
Marital Status: Single	0.009* (0.005)	0.009 (0.007)	0.007 (0.007)	0.003 (0.009)
Living with her parents	-0.003 (0.005)	-0.009 (0.007)	-0.004 (0.008)	0.002 (0.010)
Employment status: Employed	-0.003 (0.004)	-0.017*** (0.006)	-0.013** (0.006)	-0.006 (0.008)
Employment status: Unemployed	-0.017** (0.007)	-0.030*** (0.009)	-0.033*** (0.009)	-0.000 (0.011)
Scale of income	0.007*** (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.002 (0.003)
Size of town		0.004** (0.002)		
Respect of human rights in own country		0.061*** (0.008)		
Self-positioning in political scale		0.002 (0.003)		
Satisfaction with the way democracy develops			0.085*** (0.011)	
Democracy in own country				0.019*** (0.004)
Waves (clusters)	3, 4, 5	3, 4, 5	3, 4	5
Observations	168,542	66,661	71,819	45,647

Marginal effects measure the change in the probability of choosing the fourth category. Column (4) corresponds to the marginal effects of column (5) in Table 4. Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. The row called “Waves” specifies the survey waves included in the sample. In column (1), for example, the regression only includes the 3rd, 4th and 5th waves of the survey. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Education and Measures of Preference for Democracy by sub-samples

	Ordered Probit Regressions			
	Dependent variable: Approval of a democratic political system			
	ICRG - Democratic Accountability ≤ mean (4.3)		ICRG - Democratic Accountability > mean (4.3)	
	(1)	(2)	(3)	(4)
	Coefficient	Marginal Effect (=4)	Coefficient	Marginal Effect (=4)
Schooling	0.021*** (0.003)	0.008*** (0.001)	0.036*** (0.004)	0.014*** (0.002)
Age	0.003*** (0.001)	0.001*** (0.000)	0.006*** (0.001)	0.002*** (0.000)
Gender: Female	-0.041*** (0.014)	-0.016*** (0.006)	-0.084*** (0.012)	-0.033*** (0.005)
Marital Status: Single	0.017 (0.015)	0.007 (0.006)	0.030 (0.018)	0.012 (0.007)
Living with her parents	-0.008 (0.020)	-0.003 (0.008)	-0.003 (0.018)	-0.001 (0.007)
Employment status: Employed	0.014 (0.017)	0.006 (0.007)	-0.011 (0.015)	-0.005 (0.006)
Employment status: Unemployed	-0.015 (0.018)	-0.006 (0.007)	-0.048* (0.029)	-0.019* (0.012)
Scale of income	0.017*** (0.006)	0.007*** (0.002)	0.021*** (0.005)	0.008*** (0.002)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Observations	68,149	68,149	88,025	88,025
Country Waves (clusters)	51		80	
Pseudo R2	0.0758		0.0558	

To estimate the sub-samples, we use the mean value of the variable “Democratic Accountability Index” (from ICRG). The cut-off point is shown in the table; corresponding definitions of variables are shown in Table 1. Marginal effects measure the change in the probability of choosing the fourth category. Robust standard errors are presented in parentheses. They are clustered by country and wave. The sample in all these regressions includes three waves (3rd, 4th and 5th). See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Education and Measures of Preference for Democracy (Coefficients)

	Ordered Probit Regressions (Coefficients)							
	Dependent variable:							
	Agree with "In democracy, economic system does not run badly"	Agree with "Democracies are good at maintaining order"	Agree with "Democracy may have problems but is better"	Importance of living in a country that is governed democratically				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Schooling	0.027*** (0.003)	0.033*** (0.004)	0.027*** (0.003)	0.031*** (0.004)	0.027*** (0.003)	0.030*** (0.006)	0.031*** (0.003)	0.039*** (0.005)
Age	0.001 (0.001)	0.000 (0.001)	-0.001*** (0.000)	-0.002*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.006*** (0.002)
Gender: Female	-0.086*** (0.011)	-0.092*** (0.014)	-0.044*** (0.009)	-0.031** (0.013)	-0.046*** (0.010)	-0.049*** (0.013)	-0.030* (0.016)	-0.033 (0.025)
Marital Status: Single	0.040** (0.016)	0.035* (0.020)	0.018 (0.013)	-0.001 (0.019)	-0.014 (0.014)	-0.035 (0.022)	-0.003 (0.017)	-0.019 (0.031)
Living with her parents	-0.044*** (0.015)	-0.057*** (0.021)	-0.039*** (0.012)	-0.045** (0.018)	0.008 (0.014)	0.025 (0.020)	0.000 (0.016)	-0.003 (0.024)
Employment status: Employed	0.010 (0.011)	0.003 (0.018)	0.016 (0.010)	0.020 (0.015)	0.002 (0.012)	-0.017 (0.017)	0.003 (0.018)	-0.014 (0.028)
Employment status: Unemployed	-0.076*** (0.017)	-0.079** (0.031)	-0.038** (0.016)	-0.048* (0.028)	-0.029 (0.022)	-0.047 (0.032)	-0.023 (0.036)	-0.071 (0.054)
Scale of income	0.032*** (0.004)	0.032*** (0.004)	0.026*** (0.004)	0.023*** (0.004)	0.018*** (0.005)	0.018*** (0.005)	0.008 (0.008)	-0.003 (0.010)
Size of town		0.005 (0.005)		0.010** (0.005)		0.012*** (0.004)		0.014 (0.009)
Respect of human rights in own country		0.090*** (0.022)		0.083*** (0.020)		0.100*** (0.022)		0.028 (0.031)
Self-positioning in political scale		0.014* (0.007)		-0.004 (0.009)		0.020** (0.010)		0.018 (0.013)
Satisfaction with the way democracy develops		0.135*** (0.026)		0.123*** (0.021)		0.156*** (0.027)		
Democracy in own country								0.099*** (0.015)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Waves	3,4	3,4	3,4	3,4	3,4	3,4	5	5
Observations	105,417	42,415	107,692	42,914	108,941	43,520	52,766	23,310
Number of Country Waves (clusters)	97	54	98	54	97	54	39	26
Pseudo R2	0.0433	0.0548	0.0424	0.0595	0.0621	0.0966	0.0295	0.0436

Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. The row called "Waves" specifies the survey waves included in the sample. In column (1), for example, the regression only includes the 3rd and 4th waves of the survey. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1.

Table 8. Education and Approval of a Democratic Political System, IV estimates

	Ordered Probit Regressions and Instrumental Variables			
	Dependent variable: Approval of a democratic political system			
	(1) Coefficient	(2) Marginal Effect (=4)	(3) Coefficient	(4) Marginal Effect (=10)
Schooling	0.032*** (0.007)	0.013*** (0.003)	0.030* (0.016)	0.012* (0.006)
Age	0.004*** (0.001)	0.002*** (0.000)	0.004** (0.002)	0.002** (0.001)
Gender: Female	-0.064*** (0.011)	-0.026*** (0.004)	-0.064*** (0.017)	-0.025*** (0.007)
Marital Status: Single	0.023 (0.015)	0.009 (0.006)	0.032 (0.025)	0.013 (0.010)
Living with her parents	-0.006 (0.015)	-0.002 (0.006)	-0.029 (0.023)	-0.011 (0.009)
Employment status: Employed	-0.013 (0.015)	-0.005 (0.006)	-0.056* (0.029)	-0.022* (0.012)
Employment status: Unemployed	-0.042** (0.019)	-0.017** (0.008)	-0.110*** (0.030)	-0.044*** (0.012)
Scale of income	0.011** (0.005)	0.004** (0.002)	0.010 (0.009)	0.004 (0.004)
Size of town			0.007 (0.006)	0.003 (0.002)
Respect of human rights in own country			0.102*** (0.023)	0.041*** (0.009)
Self-positioning in political scale			-0.000 (0.008)	-0.000 (0.003)
Country dummies	Yes	Yes	No	No
Year dummies	Yes	Yes	Yes	Yes
Waves	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5
Observations	129,506	129,506	39,224	39,224
Number of Country Waves (clusters)	112		50	
Pseudo R2	0.0576		0.0634	
Instruments Significance (1st stage, P-value)	0.000		0.000	

Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. These are the results of the second stage regressions. In the first stages, education is explained by all the other controls presented here and the excluded instruments: family savings and number of children. The results of the first stages are presented in Appendix 4. Marginal effects measure the change in the probability of choosing the fourth category. The row called “Waves” specifies the survey waves included in the sample. In column (1), for example, the regression only includes the 3rd and 4th waves of the survey. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1

Table 9. Education and Measures of Preference for Democracy IV Estimates

	Ordered Probit Regressions and Instrumental Variables							
	Dependent variable:							
	Agree with "In democracy, economic system does not run badly"	Agree with "Democracies are good at maintaining order"	Agree with "Democracy may have problems but is better"	Importance of living in a country that is governed democratically				
(1) Coefficient	(2) Marginal Effect (=4)	(3) Coefficient	(4) Marginal Effect (=4)	(5) Coefficient	(6) Marginal Effect (=4)	(7) Coefficient	(8) Marginal Effect (=4)	
Schooling	0.019*	0.004*	0.023***	0.005***	0.020*	0.008*	0.036***	0.014***
	(0.011)	(0.003)	(0.009)	(0.002)	(0.010)	(0.004)	(0.013)	(0.005)
Age	0.000	0.000	-0.001	-0.000	0.004***	0.002***	0.005***	0.002***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)
Gender: Female	-0.080***	-0.018***	-0.055***	-0.013***	-0.036***	-0.014***	-0.032*	-0.013*
	(0.013)	(0.003)	(0.011)	(0.002)	(0.013)	(0.005)	(0.018)	(0.007)
Marital Status: Single	0.049**	0.011**	0.029*	0.007*	-0.010	-0.004	-0.018	-0.007
	(0.020)	(0.004)	(0.015)	(0.004)	(0.019)	(0.007)	(0.022)	(0.009)
Living with her parents	-0.038**	-0.008**	-0.031**	-0.007**	0.017	0.007	-0.011	-0.004
	(0.017)	(0.004)	(0.015)	(0.003)	(0.017)	(0.006)	(0.018)	(0.007)
Employment status: Employed	0.016	0.004	0.012	0.003	-0.006	-0.002	0.006	0.002
	(0.015)	(0.003)	(0.013)	(0.003)	(0.016)	(0.006)	(0.024)	(0.010)
Employment status: Unemployed	-0.067***	-0.015***	-0.040**	-0.009**	-0.017	-0.006	-0.017	-0.007
	(0.019)	(0.004)	(0.019)	(0.004)	(0.023)	(0.009)	(0.039)	(0.016)
Scale of income	0.030***	0.007***	0.022***	0.005***	0.016**	0.006**	0.004	0.002
	(0.007)	(0.001)	(0.006)	(0.001)	(0.006)	(0.003)	(0.010)	(0.004)
Country dummies	Yes	Yes	No	No	Yes	Yes	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Waves	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	5	5
Observations	74,299	74,299	75,837	75,837	76,248	76,248	46,795	46,795
Number of Country Waves (clusters)	71		72		71		37	
Pseudo R2	0.0395		0.0334		0.0571		0.0274	
Instruments Significance (1st stage, P-value)	0.000		0.000		0.000		0.000	

Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. These are the results of the second stage regressions. In the first stages, education is explained by all the other controls presented here and the excluded instruments: family savings and number of children. The results of the first stages are presented in Appendix 4. Marginal effects measure the change in the probability of choosing the fourth category, for columns (1) to (6), and the 10th category, for columns (7) and (8). The row called “Waves” specifies the survey waves included in the sample. In column (1), for example, the regression only includes the 3rd and 4th waves of the survey. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1

Appendix 1. Country Sample by Survey Wave

Country	Wave			Total	Country	Wave			Total
	Wave 3 1994- 1999	Wave 4 1999- 2004	Wave 5 2005- 2008			Wave 3 1994- 1999	Wave 4 1999- 2004	Wave 5 2005- 2008	
Albania	999	1,000	0	1,999	Korea, Rep.	1,249	1,200	1,200	3,649
Algeria	0	1,282	0	1,282	Latvia	1,200	1,013	0	2,213
Argentina	1,079	1,280	1,002	3,361	Lithuania	1,009	1,018	0	2,027
Armenia	2,000	0	0	2,000	Luxembourg	0	1,211	0	1,211
Australia	2,048	0	1,421	3,469	Malaysia	0	0	1,201	1,201
Austria	0	1,522	0	1,522	Mali	0	0	1,534	1,534
Azerbaijan	2,002	0	0	2,002	Malta	0	1,002	0	1,002
Bangladesh	1,525	1,500	0	3,025	Mexico	2,364	1,535	1,560	5,459
Belarus	2,092	1,000	0	3,092	Moldova	984	1,008	1,046	3,038
Belgium	0	1,912	0	1,912	Morocco	0	2,264	1,200	3,464
Brazil	1,149	0	1,500	2,649	Netherlands	0	1,003	1,050	2,053
Bulgaria	1,072	1,000	1,001	3,073	New Zealand	1,201	0	954	2,155
Burkina Faso	0	0	1,534	1,534	Nigeria	1,996	2,022	0	4,018
Canada	0	1,931	0	1,931	Norway	1,127	0	0	1,127
Chile	1,000	1,200	1,000	3,200	Pakistan	733	2,000	0	2,733
China	2,280	1,000	3,242	6,522	Peru	1,211	1,501	1,500	4,212
Colombia	6,025	0	3,025	9,050	Philippines	1,200	1,200	0	2,400
Croatia	1,196	1,003	0	2,199	Poland	1,153	1,095	1,000	3,248
Cyprus	0	0	1,050	1,050	Portugal	0	1,000	0	1,000
Czech Republic	1,147	1,908	0	3,055	Romania	1,239	1,146	1,776	4,161
Denmark	0	1,023	0	1,023	Russian Federation	2,040	2,500	2,033	6,573
Dominican Republic	417	0	0	417	Saudi Arabia	0	1,502	0	1,502
Egypt, Arab Rep.	0	3,000	3,051	6,051	Singapore	0	1,512	0	1,512
El Salvador	1,254	0	0	1,254	Slovak Republic	1,095	1,331	0	2,426
Estonia	1,021	1,005	0	2,026	Slovenia	1,007	1,006	1,037	3,050
Ethiopia	0	0	1,500	1,500	South Africa	2,935	3,000	2,988	8,923
Finland	987	1,038	1,014	3,039	Spain	1,211	2,409	1,200	4,820
France	0	1,615	1,001	2,616	Sweden	1,009	1,015	1,003	3,027
Germany	2,026	2,036	2,064	6,126	Switzerland	1,212	0	1,241	2,453
Ghana	0	0	1,534	1,534	Tanzania	0	1,171	0	1,171
Greece	0	1,142	0	1,142	Thailand	0	0	1,534	1,534
Hong Kong, China	0	0	1,252	1,252	Trinidad and Tobago	0	0	1,002	1,002
Hungary	650	1,000	0	1,650	Turkey	1,907	4,607	1,346	7,860
Iceland	0	968	0	968	Uganda	0	1,002	0	1,002
India	2,040	2,002	2,001	6,043	Ukraine	2,811	1,195	1,000	5,006
Indonesia	0	1,004	2,015	3,019	United Kingdom	1,093	2,000	1,041	4,134
Iran, Islamic Rep.	0	2,532	2,667	5,199	United States	1,542	1,200	1,249	3,991
Iraq	0	2,325	2,701	5,026	Uruguay	1,000	0	0	1,000
Ireland	0	1,012	0	1,012	Venezuela, RB	1,200	1,200	0	2,400
Israel	0	1,199	0	1,199	Vietnam	0	1,000	1,495	2,495
Italy	0	2,000	1,012	3,012	Zambia	0	0	1,500	1,500
Japan	1,054	1,362	1,096	3,512	Zimbabwe	0	1,002	0	1,002
Jordan	0	1,223	1,200	2,423	Total	71,791	94,894	72,573	239,258

Appendix 2. Education and Democracy for the Least Democratic Countries

Ordered Probit Regressions		
Dependent variable: Approval of a democratic political system		
ICRG - Democratic Accountability <= 3		
	(1)	(2)
	Coefficient	Marginal Effect (=4)
Schooling	0.011*** (0.004)	0.004*** (0.002)
Age	0.002* (0.001)	0.001* (0.000)
Gender: Female	-0.037 (0.023)	-0.015 (0.009)
Marital Status: Single	0.006 (0.024)	0.002 (0.009)
Living with her parents	0.004 (0.029)	0.002 (0.012)
Employment status: Employed	0.024 (0.031)	0.009 (0.012)
Employment status: Unemployed	-0.010 (0.041)	-0.004 (0.016)
Scale of income	0.019*** (0.007)	0.007*** (0.003)
Country dummies	Yes	Yes
Year dummies	Yes	Yes
Observations	25,599	25,599

This sub-sample includes those countries with the lower “Democratic Accountability Index” (from ICRG): Saudi Arabia, Iraq, VietNam, Pakistan, Belarus, Zimbabwe, Algeria, Egypt, Singapore, Uganda, China, Nigeria, Hong Kong, and the Russian Federation. Definitions of the variables are shown in Table 1. Marginal effects measure the change in the probability of choosing the fourth category. Robust standard errors are presented in parentheses. The row called “Waves” specifies the survey waves included in the sample. See appendix 1 for correspondence of survey wave and year of survey. We replicated this same exercise at the country level and find similar results for several countries, although not for all, among the latter, China, Pakistan, and Saudi Arabia. Results are clustered by country and wave.

*** p<0.01, ** p<0.05, * p<0.1.

Appendix 3. Measures of Preference for Democracy and Education by Sub-Samples

	Ordered Probit Regressions							
	Dependent variable: Approval of a democratic political system							
	Satisfaction with democracy is <= mean (2.4)		Satisfaction with democracy is > mean (2.4)		Democracy in the country is <= mean (6.4)		Democracy in the country is > mean (6.4)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coefficient	Marginal Effect (=4)	Coefficient	Marginal Effect (=4)	Coefficient	Marginal Effect (=4)	Coefficient	Marginal Effect (=4)
Schooling	0.036*** (0.005)	0.014*** (0.002)	0.033*** (0.004)	0.013*** (0.002)	0.025*** (0.004)	0.010*** (0.002)	0.026*** (0.004)	0.010*** (0.002)
Age	0.003*** (0.001)	0.001*** (0.000)	0.004*** (0.001)	0.002*** (0.000)	0.005*** (0.001)	0.002*** (0.000)	0.004*** (0.001)	0.001*** (0.000)
Gender: Female	-0.073*** (0.016)	-0.028*** (0.006)	-0.092*** (0.022)	-0.036*** (0.009)	-0.055*** (0.019)	-0.022*** (0.007)	-0.028 (0.017)	-0.011 (0.007)
Marital Status: Single	0.004 (0.021)	0.002 (0.008)	0.026 (0.025)	0.010 (0.010)	0.024 (0.027)	0.010 (0.011)	-0.008 (0.029)	-0.003 (0.011)
Living with her parents	-0.004 (0.017)	-0.002 (0.007)	-0.014 (0.032)	-0.006 (0.013)	0.013 (0.029)	0.005 (0.011)	-0.004 (0.028)	-0.002 (0.011)
Employment status: Employed	-0.018 (0.019)	-0.007 (0.007)	-0.054** (0.022)	-0.021** (0.009)	-0.016 (0.023)	-0.006 (0.009)	-0.029 (0.028)	-0.011 (0.011)
Employment status: Unemployed	-0.077*** (0.027)	-0.029*** (0.010)	-0.095** (0.037)	-0.037** (0.015)	0.000 (0.035)	0.000 (0.014)	-0.012 (0.038)	-0.005 (0.015)
Scale of income	0.019*** (0.004)	0.007*** (0.002)	0.013** (0.006)	0.005** (0.003)	0.006 (0.008)	0.002 (0.003)	0.004 (0.008)	0.001 (0.003)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Waves	3, 4	3, 4	3, 4	3, 4	5	5	5	5
Observations	37,921	37,921	33,898	33,898	21,321	21,321	24,326	24,326
Country Waves	67		67		37		37	
Pseudo R2	0.0631		0.0574		0.0554		0.0588	

To estimate the sub-samples, we generate the media of “satisfaction with democracy” and “democracy in the country”, and they were considered the cut-off points. Their values are show in the Table. Marginal effects measure the change in the probability of choosing the fourth category. Robust standard errors are presented in parentheses. They are clustered by country and wave. The row called “Waves” specifies the survey waves included in the sample. See Appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 4 Measures of Preference for Democracy and Education (Marginal Effects)

	Ordered Probit Regressions (Marginal Effects)							
	Dependent variable:							
	Agreem. with "In democracy, economic system does not run badly" (=4)	Agreem. with "Democracies are good at maintining order" (=4)	Agreem. with "Democracy may have problems but is better" (=4)	Importance of living in a country that is governed democratically (=10)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Schooling	0.006*** (0.001)	0.007*** (0.001)	0.006*** (0.001)	0.007*** (0.001)	0.010*** (0.001)	0.012*** (0.002)	0.012*** (0.001)	0.016*** (0.002)
Age	0.000 (0.000)	0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.001)
Gender: Female	-0.018*** (0.002)	-0.019*** (0.003)	-0.010*** (0.002)	-0.007** (0.003)	-0.018*** (0.004)	-0.019*** (0.005)	-0.012* (0.006)	-0.013 (0.010)
Marital Status: Single	0.009** (0.003)	0.007* (0.004)	0.004 (0.003)	-0.000 (0.004)	-0.005 (0.006)	-0.013 (0.009)	-0.001 (0.007)	-0.008 (0.012)
Living with her parents	-0.009*** (0.003)	-0.011*** (0.004)	-0.009*** (0.003)	-0.010** (0.004)	0.003 (0.005)	0.010 (0.008)	0.000 (0.006)	-0.001 (.)
Employment status: Employed	0.002 (0.002)	0.001 (0.004)	0.004 (0.002)	0.004 (0.003)	0.001 (0.005)	-0.007 (0.007)	0.001 (0.007)	-0.006 (0.011)
Employment status: Unemployed	-0.015*** (0.003)	-0.015*** (0.006)	-0.008** (0.003)	-0.010* (0.006)	-0.011 (0.008)	-0.018 (0.012)	-0.009 (0.014)	-0.028 (0.022)
Scale of income	0.007*** (0.001)	0.007*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.007*** (0.002)	0.007*** (0.002)	0.003 (0.003)	-0.001 (0.004)
Size of town		0.001 (0.001)		0.002** (0.001)		0.005*** (0.002)		0.005 (0.003)
Respect of human rights in own country		0.018*** (0.004)		0.019*** (0.004)		0.039*** (0.009)		0.011 (0.012)
Self-positioning in political scale		0.003* (0.002)		-0.001 (0.002)		0.008** (0.004)		0.007 (0.005)
Satisfaction with the way democracy develops		0.027*** (0.005)		0.027*** (0.004)		0.060*** (0.010)		
Democracy in own country								0.039*** (0.006)
Waves	3,4	3,4	3,4	3,4	3,4	3,4	5	5
Observations	105,417	42,415	107,692	42,914	108,941	43,520	52,766	23,310

Marginal effects measure the change in the probability of choosing the fourth category, for columns (1) to (6), and the 10th category, for columns (7) and (8). Robust standard errors are presented in parentheses. They are clustered by country and wave. The row called "Waves" specifies the survey waves included in the sample. See appendix 1 for correspondence of survey wave and year of survey. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 5. First Stages of Tables 8 and 9

	OLS regressions					
	Dependent variable: Years of schooling					
	Table 7		Table (8)			
	(1)	(3)	(1)	(3)	(5)	(7)
Age	-0.038*** (0.004)	-0.041*** (0.007)	-0.035*** (0.005)	-0.035*** (0.005)	-0.036*** (0.005)	-0.044*** (0.006)
Gender: Female	-0.144** (0.058)	-0.044 (0.083)	-0.044 (0.065)	-0.061 (0.065)	-0.076 (0.067)	-0.256** (0.114)
Marital Status: Single	0.111 (0.084)	0.119 (0.130)	0.006 (0.120)	-0.014 (0.116)	0.013 (0.118)	0.093 (0.132)
Living with her parents	-0.015 (0.056)	-0.008 (0.074)	-0.040 (0.078)	-0.015 (0.077)	-0.023 (0.074)	0.082 (0.087)
Employment status: Employed	0.861*** (0.095)	0.792*** (0.117)	0.850*** (0.126)	0.817*** (0.125)	0.828*** (0.133)	0.820*** (0.122)
Employment status: Unemployed	0.143 (0.111)	-0.031 (0.166)	0.243* (0.128)	0.204 (0.124)	0.229* (0.134)	0.064 (0.212)
Scale of income	0.459*** (0.029)	0.350*** (0.033)	0.445*** (0.036)	0.453*** (0.036)	0.454*** (0.037)	0.461*** (0.039)
Number of children	-0.456*** (0.029)	-0.389*** (0.040)	-0.410*** (0.033)	-0.420*** (0.033)	-0.414*** (0.034)	-0.514*** (0.052)
Savings: Family just got by	-0.646*** (0.056)	-0.787*** (0.088)	-0.531*** (0.063)	-0.519*** (0.067)	-0.534*** (0.068)	-0.748*** (0.099)
Savings: Family spent some savings	-0.352*** (0.087)	-0.576*** (0.127)	-0.321*** (0.103)	-0.349*** (0.105)	-0.323*** (0.106)	-0.359** (0.160)
Savings: Family spent savings and borrowed money	-0.659*** (0.091)	-0.776*** (0.131)	-0.622*** (0.123)	-0.587*** (0.120)	-0.628*** (0.127)	-0.752*** (0.169)
Constant	9.078*** (1.026)	8.094*** (0.401)	11.766*** (0.606)	11.551*** (0.634)	11.778*** (0.632)	12.901*** (0.412)
Observations	127,011	39,090	72,215	73,745	74,076	46,566
R-squared	0.329	0.330	0.305	0.307	0.317	0.365

Robust standard errors are presented in parentheses. They are clustered by country and corresponding survey wave. These are the results of the first stage regressions of Tables 7 and 8 (using IV). Education is explained by all the other controls presented here and the excluded instruments: family savings and number of children.

*** p<0.01, ** p<0.05, * p<0.1