DOES COMPULSORY VOTING REDUCE INEQUALITY IN TURNOUT? AN EXAMINATION OF ITS IMPACT ON EDUCATIONAL BIASES

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ABSTRACT
One of the main reasons used to justify the adoption of compulsory voting is the capacity of this mechanism to boost turnout rates to quasi-universal levels and to eliminate the biases in turnout due to socio-economic and socio-demographic characteristics. This paper focuses on educational biases in turnout and examines the relationship between this institution and the effect of relative education in a cross-national perspective. There are two arguments that link compulsory voting to lower inequality levels. According to the indirect causal pathway when nearly everyone votes, non-voters approach a random selection of the population and there is no room for inequalities to emerge. A direct causal pathway should also exist because compulsory voting alters the cost structure of voting. Low educated citizens benefit disproportionately from this modification because they are less able to bear the costs of voting. Therefore compulsory voting should make the effect of education less important, independently of turnout rates. I test these pathways and demonstrate that both have explanatory capacity. In countries with high turnout rates, such as those under compulsory voting, the substantive biases due to education are smaller than in countries where voting is voluntary. Additionally, this institution has a genuine equalising capacity once we control for the ceiling effects exerted by the 100% limit of turnout.

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INTRODUCTION

There is increasingly solid evidence of the existence of a small but clear declining trend in the turnout rates in most advanced industrial democracies (Franklin 2004; Gray and Caul 2000; Wattenberg 2006). Turnout decline is specially concentrated among new generations which are voting at surprisingly low rates. Young people are withdrawing from electoral participation more than could be expected due to solely life-cycle effects (Blais, Gidengil and Nevitte 2004; Franklin, Lyons and Marsh 2004; Lyons and Alexander 2000). If young adults do not match older generations as they grow up the decline will presumably continue in the future because of the process of population substitution. These facts preoccupy both experts and the public and motivate the inquiry about its reasons as well as about possible solutions. Therefore, possible remedies to this alleged democratic malaise have been brought to the forefront of the academic debate in recent years.

One of the possible solutions to low turnout rates is compulsory voting. The ability of this institution to raise turnout in those advanced industrial democracies that apply it is indeed a widely stated fact in comparative research (Anduiza 2002; Blais and Dobrzynska 1998; Franklin 2000; Hirczy 1994; Jackman 1987; Jackman and Miller 1995; Powell 1986; Rose 2004; Siaroff and Merer 2002). However, beyond this general statement, and some more specific investigations in countries that enforce it, many aspects concerning the introduction and consequences of this mechanism remain under-researched.

Less publicly known but equally or more concerning are the expectable effects of low turnout rates on biases in participation. If the tendency to withdraw is disproportionately concentrated among certain population groups –such as young or socially disadvantaged citizens - the result is a sharpening of the differences between voters and abstainers. Prominent scholars have argued that at low turnout rates inequalities in political participation are likely to be more pronounced and that compulsory voting is not only the most promising way to boost turnout rates but also to reduce biases in turnout such as those derived from socio-economic characteristics or age (Lijphart 1997, 2000; Wattenberg 2006, Hill 2006). In short, the capacity of compulsory voting to reduce “democracy’s unresolved dilemma” i.e. persisting and even deepening inequalities in
electoral participation (Lijphart 1997:1) is an additional important theoretical argument to support the use of this institution. However, this argument has not been systematically tested.

Possible sources of bias in voting participation are indeed manifold. Many individual-level characteristics can affect the propensity of citizens to go to the polls. Factors such as gender, age, education, social class, income or race and ethnicity are closely correlated and often inequalities in these realms are mutually reinforcing. Because of this complexity and the difficulty of cross-national comparisons it is advisable to focus on only one of the individual characteristics that can be considered as a source of disadvantage in electoral participation.

If one such characteristic has a central role in the voting and political participation literature, this is education. Education, the “universal solvent” (Converse 1972:324) has been considered since the first empirical researches of turnout as one of its surest predictors—at least in the United States. Even if vote is not the political activity in which socio-economic predictors play a larger role in a cross-national perspective (Topf 1995a, 1995b; Verba, Nie and Kim 1978), there are several reasons to focus on it. Education is temporally antecedent to other socio-economic characteristics (income and occupation) of the individuals and determines them. On the other side, it is normally included just as a control variable in turnout research and is not devoted specific attention. Finally, an awarded book has proposed an alternative operationalization of education, basing in a relative model of its effects (Nie, Junn and Stehlik-Barry 1996) but this proposal has rarely been empirically applied.

The purpose of this paper is to examine the influence of compulsory voting on biases in turnout due to education. It will be tested if this institution is able to reduce the gaps across educational groups when it comes to go to the polls. In other words, it will be examined if in countries with compulsory voting biases in turnout due to education are smaller than in those countries where it is not enforced. In order to address this question firstly the expected causal link and the relationship between biases and turnout rates will be specified. Secondly some important methodological questions will be posed which are derived from issues raised by previous research. Thirdly the hypothesis will be tested in the range of applicability of Western advanced industrial democracies.
COMPULSORY VOTING AS A REMEDY FOR TURNOUT INEQUALITY

The argument for compulsory voting

Compulsory voting has been defended for several reasons. If we consider that high turnout rates are a desirable aim, making voting compulsory is an efficient way to reach it. There is indeed wide agreement in the field of comparative politics that compulsory voting is effective at pursuing this goal. It has been estimated that even after controlling for other aggregate factors, in those Latin American countries that do enforce compulsory voting turnout is about 18% higher than in those where voting is voluntary (Fornos, Power and Garand 2004). In established democracies it is the sole factor that accounts for more variation in turnout rates (Anduiza 1999; Jackman 1987), and in second order elections such as the European Parliament elections it is by itself capable of rising turnout by more than 30% (Franklin 2001). Gratschew (2004) finds that in a global perspective countries that enforce compulsory voting have turnout rates that are 15% higher. On the other side, its effect is stronger in advanced industrial countries than in other contexts (Norris 2004).

In turn, the desirability of high voting rates is usually defended because of two main grounds: firstly it is often taken as a sign of democratic health. Political entities with high turnout are considered as more legitimized. Secondly, high turnout produces election results which are closer to the real preferences of the population and avoids the emergence of big representation biases which are due to differences in the individual characteristics of the voters. In that sense, high turnout prevents unequal participation.\(^1\)

Finally, there are other hypothesized but rarely tested advantages: Compulsory voting fosters stability of the party system because repeated voting produces closer identification with parties or reduces the use of negative campaigns.

Compulsory voting does also have detractors. On the one side, it can be claimed that making vote mandatory is an unnecessary restriction of the individual liberty of the

\(^1\) Even if this is a disputed question the presence of such biases is worrisome because it entails the violation of the ideal of political equality. The main argument is that the political and social realms are closely intertwined, but the translation of social into political inequalities and their potential mutual reinforcement is problematic from a normative standpoint (Dahl 1989; Pateman 1970; Phillips 1999; Verba 2004; Walzer 1983; Young 2002).
individual. Besides normative arguments, in compulsory voting systems uninformed and uninterested citizens do also go to the polls. This increases the proportion of invalid votes and randomly cast votes (Mackerras and McAllister 1999; Power and Roberts 1995). Finally, recent economic analyses have shown that under certain conditions this mechanism can lead to a suboptimal solution because a less preferred candidate is more likely to be elected than under voluntary vote (Borgers 2004; Jakee and Sun 2006).

The central claim that will be examined in this paper is that compulsory voting is a remedy to unequal participation. It has been argued that this mechanism is able to close the sharp turnout gaps found in empirical research between socio-economic and age groups, or conversely, that biases in turnout appear due to the voluntary nature of voting in most countries (Hill 2006; Lijphart 1997; Powell 1986; Wattenberg 2006). In Lijphart’s words it “equalises participation and removes much of the bias against less-privileged citizens” (2000:150).

There are two main mechanisms through which compulsory voting can be expected to reduce turnout inequality. Firstly, there is a mechanical argument. If all voters have to go to the polls there is no room for inequalities to exist because non-voters, who are unable to attend their obligation for reasons such as illness, are likely to become a random selection of the population. The ability of compulsory voting to approach quasi universal turnout should lead to this scenario.

Secondly, compulsory voting can modify the biases in participation through its effect on the cost structure of voting. The effect of compulsory voting can be conceptualised as a strong modification in the costs of voting. In those countries where it is strictly enforced, abstainers have to pay fines or to justify their absence at the ballot box. Even if it is not strictly enforced the notion that voting is an obligation will probably increase social pressure and the sense of civic duty. In both cases compulsory voting adds important costs to electoral abstention. Because the costs of voting are nevertheless limited (Aldrich 1993), some additional costs of abstaining are enough to encourage participation.

At this point one has to ask whether the effects of compulsory voting are different for low and for high educated citizens. It is hypothesized here that independently from
turnout levels compulsory voting disproportionately fosters the turnout of low educated citizens. Some groups of citizens (for example young and low educated) still have not acquired the inertial habit of voting, have more difficulties in making sense of the political world, or are not in touch with relevant social networks (Rosenstone and Hansen 1993; Verba, Schlozman and Brady 1995). For different reasons, it is more difficult for them to face the information and decision costs derived from voting and they are typically less targeted by the mobilization efforts of political organizations. Therefore this group abstains at particularly high rates.

Compulsory voting alters the cost structure of voting introducing a homogenous cost of abstaining for everyone. This additional cost will have a larger effect on those citizens that have more difficulties in bearing the costs and fewer incentives to vote. This should help balance the disparities produced by the processes that link education to vote.

In sum, we can conceptualise both direct effects of compulsory voting through its impact on the cost structure of voting and indirect effects through the boosting of turnout close to the 100% level and therefore limits the existence of inequalities.

--- Figure 1 about here ---

**The education effect**

Education is a central individual level characteristic in participation literature which influences many attitudes and behaviours (Dalton 2002; Verba and Nie 1972; Verba, Schlozman and Brady 1995). Until recently however, it has been often found that socio-economic factors - particularly education and income- were a very weak or not at all a predictor of vote in European countries (Norris 2002; Oppenhuis 1995; Topf 1995a; Verba, Nie and Kim 1978). This fact has traditionally been attributed to the strong mobilization efforts of the European working class. Strong left parties and trade unions substituted individual with group resources and shifted policies in favour of the working class (Radcliff and Davis 2000) and therefore also disadvantaged citizens used to go massively to the polls. However, recent analyses have shown that also in European countries the gaps due to education are important, even after controlling for other individual level variables (Aarts and Wessels 2005; Gallego 2007; Kittilson 2005).
The most important examination of the effect of education on political participation is probably the work by Nie, Junn, and Stehlik-Barry (1996). These authors claim that the impact of education follows two differentiated main logics: there are both absolute and relative pathways in the causal mechanisms that link education to participation. On the one side, education enables cognitive proficiency which strengthens democratic values and is necessary in order to understand how the political world works. On the other side, education sorts citizens and determines their position in relevant social networks. This second dimension entails a comparative element: the value of one’s own education depends on the educational achievements of the citizens she competes with. In other words, a university degree is more valuable when very few people have it than when college attendance is the norm rather than the exception.

“Education and Democratic Citizenship in America” has been awarded and recognised as an important contribution to the political science literature. This work is well-known and widely cited. It has solved one of the most important turnout puzzles (Brody 1980): it satisfactorily explains why turnout is not rising in spite of the continuous increase in the mean educational level of the population in the last decades. It is paradoxical however, that very few empirical works on electoral and political participation use the relative education model proposed by these authors.

According to their work, voting responds to both logics. The causal mechanisms related to these pathways lead to the same result; high educated citizens face lower voting costs. In absolute terms, they have better cognitive skills which help in such tasks as making sense of the political world and taking the decision whom to vote. In relative terms, their centrality in social networks makes it easier for them to receive political information or to be the targeted by mobilization efforts and increases the social pressure they face to go to the polls. This explanation is consistent with mobilization and contextual theories. Education places individuals in the same networks that are relevant to bring them to the polls, while it is not likely that someone takes the effort to mobilise low educated citizens unless the result of the election is really close. However, because voting is a low cost activity the absolute model has less explanatory capacity than the relative one (1996 Chaps. 4 and 8). My own explorations with cross-national data confirm the superiority of relative education measures. In order not to duplicate all the analyses, this paper focuses therefore on the effect of relative education.
Previous empirical results and some methodological issues

The claim about the equalizing effect of compulsory voting on inequality has been tested in different settings. Beyond the substantive results, it is important to notice that these investigations raise a number of relevant methodological questions.

Hoogue and Pelleriaux (1998) have analysed the characteristics of the respondents who assure that they would not vote if compulsory voting was abolished in Belgium and conclude that the decline would be concentrated among low educated and low professional status groups. They take this result as a support for Lijphart’s claim that compulsory voting reduces inequality. However, De Winter and Ackaert (1998) argue that the methodological approach is not correct. The bivariate analysis carried out by the former authors fails to control for other predictors of turnout which leads to an overestimation of the education effect. Once controls are introduced this effect is negligible under compulsory voting and would appear if this mechanism was abolished.

In Australia there are reasons to hypothesize that in the absence of mandatory voting laws, turnout would be both lower and less equal (Louth and Hill 2005). Indirectly, several studies have shown that abolishing compulsory voting would specially harm the Labour Party (Mackerras and McAllister 1999). This is typically interpreted as support for the argument that this mechanism disproportionately fosters the vote of socially disadvantaged citizens, who are more prone to vote for left-wing parties. However, it has to be noted that there is not a wide agreement on the use of simulations based on survey data to address this point (Jackman 1999). The critics’ argument is that survey estimates are likely to overreport the voting rates and therefore counterfactual simulations based on data on reported vote or intention to vote are not reliable.

On the other side there is some comparative literature about this issue. Oppenhuis (1995) and Franklin, Van der Eijk, and Oppenhuis (1996) have examined the interactive effects between aggregate level and individual characteristics. They find that in the presence of certain institutional mechanisms there are no significant differences in the voting rates of different types of citizens. For example, compulsory voting and Sunday voting make the effect of such variables as political interest, perceived utility of the information given in the campaign or appeal of the party less important. These authors use multiple regression models which are not adequate for binary dependent variables.
such as vote because it can predict probabilities which fall outside of the possible range (are larger than one or smaller than zero). Contrarily, logistic regression eliminates ceiling and floor effects and never predicts probabilities outside the zero to one range.

In an investigation of cross-level interaction effects on turnout Anduiza (2002, 1999) notes that some variables might have a larger effect on the decision to vote of privileged citizens in statistical terms which is however translated into small variations in real turnout rates because they vote anyway at very high rates. She proposes the distinction between the magnitude of the effects and their consequences and uses both logit coefficients and predicted probabilities. She reports that these different strategies lead often to contradictory conclusions: many contextual and institutional variables origin larger changes in the turnout rates of disadvantaged citizens (in resources and motivations) in real terms because advantaged citizens vote anyway at very high rates. However, the magnitude of the effects (logit coefficients) is in most cases larger for advantaged citizens (2002:650). The impact of compulsory voting is stronger on advantaged citizens once ceiling and floor effects are controlled for but in real terms the percentual increase in their probabilities of voting is moderate because they vote anyway very frequently. On the contrary the logit coefficient is smaller for disadvantaged citizens but in real terms this small effect produces a substantial increase in their probabilities to vote, which have a larger margin to grow\(^2\).

These contributions point out two important methodological issues:

On the one side, there is a discussion about the specification of the models: can we claim that we are observing the effect of education in a bivariate analysis? Or is it necessary to control for all relevant predictors of turnout? The main alleged problem here is that bivariate or underspecified multivariate analysis overestimates the education effect because it fails to control for other individual level variables which are typically positively correlated with education.

\(^2\) There is much other research on close topics which discusses similar methodological issues. For example Nagler (1991) criticises Rosenstone and Wolfinger’s (1978) conclusion that relaxing registration requirements disproportionately fosters the turnout of disadvantaged citizens on the ground that it is necessary to specify interactive relationships in logit models. Van Egmond, De Graaf and Van der Eijk (1998) found that some contextual factors do limit the influence of individual characteristics such as education. They do also use logistic regression with data on both levels and their interactions. An alternative methodology which is still not frequently used is multilevel analysis.
This debate is a classical omitted variable problem and therefore it is useful to analyse it in that terms. According to King, Keohane and Verba (1994) omitting variables has different consequences depending on their relationship with the dependent and the explanatory variables. Variables that are irrelevant or uncorrelated with the independent variable of interest cause no bias in the estimates. Omitted variables which are correlated with the independent variable should be controlled for, except when they are in part a consequence of our key causal variable (1994:173-174).

At the individual level we can safely exclude explanatory variables which are uncorrelated with education. Among those that are correlated with education we need to ask if they are in part caused by it. Indeed, an important part of the variables which are correlated with education are in part a consequence of it (Verba, Schlozman and Brady 1995): income or occupation are temporally posterior to educational attainment and determined by it. Education does also lead to high levels of such attitudes as interest in politics, political information, or internal efficacy and determines the position in networks which are used by mobilizing agents to bring the citizens to the polls. This kind of variables should precisely be excluded of the analysis according to King, Keohane and Verba. In other words, we do not want to control for the causal paths (or intermediary variables) that lead education to have an effect on vote.

A different case is socio-demographic variables such as age, gender, and race, which are correlated with education but not a consequence of it. Gender can be safely removed from the analysis because increasing evidence points out that it is often not correlated with vote (Norris 2002). Advanced industrial democracies have very different racial patterns and it is difficult to control for this factor in a sensitive way. In Europe many members of ethnic minorities are recent migrants who often lack the right to vote. Age however should always be controlled for because it is an important predictor of vote, correlated with education but not caused by it. Some parental characteristics do also accomplish these criteria (are temporally antecedent to both education and voting and influence them) but most surveys have little information about this issue. In short, an

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3 For example, Nie, Junn, and Stehlik-Barry (1996:75-77) find that in the United States both family income and occupation are intermediary mechanisms in the influence of education on turnout. Both are affected by educational attainment and have an influence over organizational membership and social network centrality. Better educated citizens vote more not independently from but because they are more interested in politics, have better jobs and receive more demands to participate, face higher social pressure to go to the polls or feel that their actions are more capable of influencing the public life.
underspecified model at the individual level is acceptable if we want to compare the education effect across different contexts, as is the main purpose here.

At the aggregate level the situation is possibly different. Compulsory voting is most likely correlated with other system level features. For example there might be more institutional dispositions that facilitate the vote such as Sunday voting, absentee ballots and so on. In that case the causal direction is less clear. One can argue that all institutions are caused by the will of the state to maximise turnout. Other system-level variables which are unrelated to compulsory voting can also have an effect on the educational biases. Despite of this, in the absence of a theoretical model about the relation between such variables I have opted not to include them in the analysis.

The second methodological issue refers to the techniques which are to be used. Bivariate techniques do not control for the effect of different turnout rates on educational biases. Standard regression models for dichotomous dependent variables eliminate the ceiling effects of 100% turnout which are at the basis of the indirect argument (hypothesis 1) that links compulsory vote to lower inequality. Predicted probabilities allows considering the expected voting changes in real terms. Both aspects -the magnitude and the consequences of the effects- are relevant in substantive terms.

As the examples demonstrate, the methodological approach and the statistical tools we use can heavily influence the results of the analysis. There is not a sole choice about which strategy is preferable but it is necessary to pay attention at those consequences and apply the statistical tools best suited to our purposes. The present paper opts for examining the hypotheses through different approaches. This does also increase our confidence in the substantive conclusions.

**RESEARCH DESIGN AND OPERATIONALIZATION**

The question addressed in this paper is if compulsory voting reduces educational inequalities in turnout. It will be differentiated across two kinds of effects: direct and indirect. The following hypotheses will be tested:
H1: In high turnout countries inequality is lower. Countries with compulsory voting have higher turnout rates and therefore less inequality (Indirect effect)

H2: Independently from turnout level, in countries with compulsory voting educational inequality in turnout is lower (Direct effect)

The scope of the analysis

The first important methodological choice is which countries to include in the analysis. The criteria are twofold: there need to be sufficient cases with compulsory voting and the heterogeneity of the countries in economic, political and cultural terms has to be limited. Even if compulsory voting exists in many Latin American countries, they have been excluded because the effect of education has different patterns in highly developed and developing countries (Norris 2002) and compulsory voting has a much weaker effect in newer and semi-democracies than in older democracies (Norris 2004). On the other side, East European, Asian and African countries have been excluded, because compulsory voting exists in very few of them, there are few available data and it is unclear to what extent they are comparable in terms of cultural traditions and of their model of socio-economic development.

The scope of the analysis is therefore limited to 20 Western European and Anglo-Saxon OECD countries which are established democracies. No single survey covers all of them and two data sources will be combined: the two waves of the European Social Survey and the last wave of the International Social Survey Program, which has data for Australia, the USA, and Canada. All respondents who are not citizens of the

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4 It is doubtful whether Southern European countries can be considered as established democracies (for example Dalton and Wattenberg (2000) do not consider them as such). The inclusion of Greece is however important in order to increase the number of countries with compulsory voting. Consequently also Spain and Portugal are examined.

5 The inclusion of two surveys allows us to have a larger sample and does not have important disadvantages in this case. The focus of interest is not in a specific election or time point and the existence of compulsory voting does not change within countries in the time span observed.

6 New Zealand is also included in the ISSP but it was rejected for this analysis because of the substantially different wording of the question that refers to vote (“Who did you vote for?” instead of “Did you vote in the last -first order- elections?”). The reason for choosing these two surveys over others like the Comparative Study of Electoral Systems is that in the latter the measure of education in years which is the basis for the relative education measure proposed by Nie, Junn and Stehlik-Barry (1996) is not available. On the other side, the strong emphasis in comparability and the demanding criteria in the field work of
country in which the survey is done have been excluded from the analysis in order to approach a sample of the voting eligible population\(^7\). The following table summarises relevant information about the countries and data used:

-- Table 1 about here --

**The operationalization of relative education**

The logic of the relative education model proposed by Nie, Junn and Stehlik-Barry (1996) the value of one individual’s educational attainment measured in years of school attendance depends on her educational environment which is defined as the mean education of those citizens aged 25 to 50 when this individual is 25 years old. The argument is that at the moment of full entrance in the labour market (circa 25 years) the individual competes with those who are in it. The educational environment \((E_c)\) for a given birth year or cohort \((c)\) is the ratio between the sum of years of education \((e_i)\) for all individuals of the same cohort, or any of the preceding 25 birth cohorts, and the total number of individuals \((n)\) in the 26 birth cohorts \((c-25 \text{ to } c)\).

\[
E_c = \frac{\sum_{i=1}^{n} e_i}{n}
\]

In turn, they propose two strategies to include the relative pathway in multivariate analyses of turnout. The first one is to include both the information about the years of full time formal schooling \((e_i)\) and the education environment measure \((E_c)\), which is hypothesized to act as a deflator for political engagement. The second proposal is to create a summary measure of relative education \((re_i)\) which is the ratio of both terms\(^8\). I do not understand why a ratio is preferable to a subtraction to create this summary measure. A ratio creates a scale for the individuals that have less education than their educational environment which ranges from 0 to 1. On the contrary, the possible values for those with more relative education can range from 1 to a higher value. For example in the dataset used here this ratio ranges form 0 to 5.25, with a mean 1.1. Once we

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\(^7\) This step is important because in some countries there are large immigrant populations who are not entitled to vote and who have a different mean educational level than the native population. Their inclusion would bias our estimates of the voting rates across educational groups.

\(^8\) The complete explanation about the operationalization of the measures is offered in the Appendix F (Jenkins 1996).
include this measure in a regression analysis, “one unit increase in the explanatory variable” does not have any real sense. In order to avoid this problem, in this research I have subtracted the educational environment from the years of formal education. Thus:

\[ r_{ei} = \frac{e_i}{E_c} \]  

(1) Proposed by Nie, Junn and Stehlik-Barry

\[ r_{ei} = e_i - E_c \]  

(2) Used in this paper

Even if it is not reported here because of space constraints, all three strategies have been used in the exploratory analyses and they lead to similar substantive results.  

EDUCATIONAL INEQUALITY AND COMPULSORY VOTING

The first way to address the research question consists in a bivariate analysis. It allows us to present the data and to examine the indirect explanation of the equalizing effect of compulsory voting which is reflected in hypothesis 1.

In order to compare the differences in the voting rates across different education groups it is necessary to build a summary measure of educational inequality. For each country I have recoded the relative education variable in three categories: citizens with low relative education (lre) are those who have attended school at least one year less than the mean of the 25 precedent age cohorts. For example one citizen is included in this category if she attended school 9 years and the mean educational level of the citizens of their age and up to 25 years older is 10 years or more. More relative education (hre) means having attended school at least one year longer than the educational environment.

lre if \( r_{ei} < E_c - 1 \) ; hre if \( r_{ei} > E_c + 1 \)

The rest have average relative education and are excluded from the analysis. Educational inequality (I) is the ratio of the mean reported vote (\( \mu \)) of citizens with low relative education divided through that of those with high relative education.

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9 It has to be noted that there are alternative proposals to operationalize this concept. The one proposed by Helliwell and Putnam (1999) is impossible to apply to the data I use here. Tenn (2005) has proposed an alternative measure of relative education, but I am still unsure about how to apply it.

10 In this case a ratio is preferable. On the one side, a substraction would overrepresent the biases in high turnout countries. For example suppose in country A 40% of the less educated versus 50% of the more
\[ I = \frac{\mu_{\text{hre}}}{\mu_{\text{lre}}} \]

It is striking that in all countries citizens with more relative education vote more frequently. Beyond that, these data provide support for the argument that compulsory voting reduces inequality. The two more egalitarian countries, Greece and Australia, enforce compulsory voting and they are the only ones in which the differences in the voting rates of both groups are not statistically significant. Belgium and Italy, where compulsory voting exists but is not enforced, are also among the most egalitarian countries. Luxembourg however is in the middle range and the difference between the voting rates of both groups is substantial: 12 points. This seems to imply that compulsory voting does not automatically eliminate inequalities but it has a clear equalizing effect even where sanctions do not exist. In the other extreme of the table Portugal, Germany and the USA have the largest gaps.

The correlation between overall reported turnout rates and the inequality ratio is -0.72 and highly statistically significant. The following figure displays graphically the distribution of turnout rates and the inequality measure and shows that compulsory voting countries have both low inequality and high turnout. The only country that matches them in terms of these dimensions is Denmark. The Unites States is clearly an outstanding case across both dimensions.

These analyses clearly confirm the indirect hypothesized pathway: countries with high turnout rates have small gaps due to relative education. Compulsory voting countries have high turnout rates and they do also have small or inexisten gaps due to education.

This analysis does not distinguish across different age groups. Because age is an important explanatory variable of voting which has to be controlled for, it is worth
examining the patterns of inequality closer. Additionally, as has been stated, the low turnout rates of young adults are a current issue of concern and they can also hint at expectable future trends. The following table displays the inequality ratio for three different age groups. The fact that in almost all countries young age groups concentrate the larger gaps stands as the unambiguous result of the separate analysis.

-- Table 3 about here --

In all countries but Greece the young age group has the larger inequality rate. In the majority of the countries this rate is larger than 1,20. On the contrary, the differences are less pronounced for middle aged and senior citizens. Again we can see that in countries with compulsory voting inequalities are less pronounced. Greece, Australia, and Belgium, together with Denmark and Spain, are the only countries in which no age group has a ratio larger than 1,20. In Luxembourg however, the gaps are important for the young age cohorts.

This examination opens the question of why turnout is more unequal among new citizens. It is possible (but not very plausible) that lower educated citizens begin to develop the habit of voting later in life than their better educated fellow citizens and catch up to normal rates in their adult years. Another interpretation of these results is that educational inequalities might be growing among new generations; this is, young low educated citizens are voting at even lower rates than would be expected due to past patterns. If this is true, generational replacement will lead to growing educational gaps.

Once the first hypothesis has been examined, the question remains whether the equalising effect of turnout is entirely attributable to its capacity to boost turnout levels or if it has a genuine direct effect as expected according to hypothesis 2. Voting is a low cost activity, but research on institutions has repeatedly shown that citizens respond at the aggregate level to variations in its cost structure by abstaining or going to the polls in predictable directions (for recent reviews see Blais 2006; Geys 2006). Also at the group level there should be systematic differences within a political community because different population groups have different capacities to bear the costs of voting. The strong modification in the cost structure of voting introduced by compulsory voting should make these different capacities and positions less relevant.
There are different ways to assess this question. Firstly a logit regression has been carried out for each country including a control for age\textsuperscript{11}. The logit coefficient is also a summary measure of educational inequality for a given polity which has the specificity of eliminating the ceiling effect exerted by the maximum of 100\% turnout. Using logit coefficients allows us to control for the effect of turnout rates on inequality (this is, of the indirect causal pathway) and exclude them from the education estimates. The following table displays the effect of education on vote.

-- Table 4 about here --

This table provides interesting results: in countries with compulsory voting education plays a very limited role in predicting turnout even if the ceiling effect of turnout levels is removed but this statement does not apply in countries that lack this institution. The biggest coefficient is for Belgium (0.106) which is however quite limited. This general statement is more plausible if we observe the differences between this analysis and the former one. On the one side, Luxemburg is much higher in the table than we would expect according to the results of the bivariate analysis.

More importantly, the result for Denmark confirms that differences in the biases due to education are not solely the mechanical result of varying turnout rates. In the previous analyses Denmark joined the compulsory voting countries in terms of its turnout and inequality levels. Once we control for ceiling effects, the effect of relative education is strong in this country, while it is not in the former. What does this mean? Probably, that despite the fact that Denmark approaches quasi-universal reported turnout, non-voters in this country are not a random selection of the population but are very concentrated among low educated citizens\textsuperscript{12}. Remarkably, in all Scandinavian countries the effect of education on turnout is high, despite their high turnout rates. On the other side, in some low turnout countries such as Switzerland, and UK the effect of education is small.

The following table describes the fact that a small effect of education is not solely the mechanical result of turnout rates. Countries with compulsory voting and those that had

\textsuperscript{11} Age is modelled curvilinearly in order to capture the typical form of the voting pattern across age groups: a sharp increase in young adulthood is followed by stabilization and a decrease in old citizens.

\textsuperscript{12} Note that Anduiza (2000:230) finds a similar result.
it in the recent past (Italy), plus Canada, combine high turnout rates and small education effects once we control for the floor and ceiling limits of turnout. Paradoxically, in countries with a strong social-democratic tradition, and strong left-parties and trade unions such as the Scandinavian ones and Austria the magnitude of the effect of education on turnout is large despite their high turnout rates. We find in turn both weak and strong effects of education in countries with low turnout, and there is no intuitive interpretation of the grouping pattern.

-- Table 5 about here --

A second way to assess hypothesis 2 is through a specific test of the compulsory voting effect. In order to do that it is necessary to merge the surveys into a sole dataset\textsuperscript{13}. The idea that compulsory voting reduces inequality has to be modelled as an interaction:

\[ Y_i = \beta_0 + \beta_1(\text{reledu}) + \beta_2(\text{compvote}) + \beta_3(\text{reledu*compvote}) + \beta_4(\text{controls}) + \epsilon_i \]

If compulsory voting reduces the magnitude of the education effect then we expect that there will be a negative coefficient in the interactive term of education and compulsory voting\textsuperscript{14}. This will be tested in a simple model introducing the relative education variable, compulsory voting as a dummy variable and the interaction term between both. The only controls included are age and age squared.

-- Table 6 about here --

Indeed, there exists a significant interactive effect between education and compulsory voting in the expected direction. This means that in compulsory voting countries the statistical magnitude of the effect of education on voting is more limited than in those under voluntary voting. Education has a smaller capacity to influence the decision to vote or to abstain for reasons that are independent from the mechanical relationship between turnout rates. In other words, this analysis provides evidence that there is a

\textsuperscript{13} Each country is equally weighted because the focus of the analysis is not to make descriptive inference of the population behavior but to assess the impact of an institution.

\textsuperscript{14} Interaction effects when there is one dummy variable are luckily clear to interpret. In this case, we expect that the total education effect is smaller under voluntary voting (\(\beta_1\)) than under compulsory voting (\(\beta_1 + \beta_3\)). Therefore the \(\beta_3\) coefficient is expected to be negative and significant.
genuine direct link between both factors. More specifically, in countries with compulsory voting each additional year of relative education increases the log odds of voting by 0.050 (0.123-0.073) while in those with voluntary voting the log odds for each additional year are 0.123. In order to increase the certainty about these results I have run regressions with different operationalizations of education and their corresponding interactions: measured in years, the same including a term for the educational environment, and relative education as the ratio of years of schooling and educational environment. The interactive terms were always negative and significant.

Finally, I have turned the results into predicted probabilities in order to observe the consequences of the interactive effect between compulsory voting and education. The graph shows the expected probabilities to vote depending on the relative education level of a 45 years old citizen\(^\text{15}\).

\[\text{-- Figure 2 about here --}\]

It clearly visualises that the consequences of the education effect are different in countries with compulsory or voluntary voting. In the former ones education does only cause a small variation in the expected probability to vote of approximately 0.06 (or 6 percent). Under voluntary voting the probability rises by 0.2 when we move from the minimum relative education -which is here at least 5 years less relative education than the educational environment- to the maximum relative education\(^\text{16}\). If we observe younger citizens, the capacity of compulsory voting to boost turnout rates among the least educated is even larger. For a 25 year old person who has the minimum level of relative education the probability to vote is 0.35 higher (0.80 versus 0.45) under compulsory than under voluntary voting.

\(^{15}\) Unluckily, the report of the results in terms of predicted probabilities is very constrained and we need to specify the profile of individuals, in this case in regard to age.

\(^{16}\) The scale of the relative education variable has been modified here in order to present the results more clearly. If we use a one year-one point scale the interactive effects are difficult to notice visually. The range is here 0 to 1 where 0 is the minimum relative education defined as having attended school at least 5 years less frequently than the educational environment and 1 stands for those who have been schooled at least 5 years longer than the value of their educational environment.
CONCLUSIONS

This paper provides empirical evidence for an important theoretical claim, namely, that compulsory voting is able to reduce the socio-economic turnout gaps in turnout—at least for the case of education. Furthermore it has specified and tested two causal pathways that link this institution to the expected outcome of lower inequality.

On the one side there is a mechanical effect of turnout rates on inequality which can be understood in terms of Tingsten’s (1937) “Law of Dispersion”: the dispersion—or difference—of the electoral participation of certain groups is bigger when turnout is low. As he recognises, this law is a statistical construct, but nevertheless there is an intuitive truth on it: vote—and consequently inequality—have a ceiling, which corresponds to the 100% participation rate and full participatory equality. The analysis has shown that there is a negative relationship between turnout and educational gaps in turnout, and because turnout rates are very high in compulsory voting countries, they have small educational gaps.

The mechanical explanation does not fully account for the causal link between inequality and the institution of compulsory voting. Once we remove the ceiling and floor effects of turnout rates on inequality, we do still find that in countries that apply it the effect of education is clearly smaller than in those that have voluntary voting. This is taken here as support for the direct effects hypothesis which is derived from the argument that low educated citizens are disproportionately sensitive to the strong modification of the cost structure produced by compulsory voting.

Using the terminology proposed by Anduiza (1999, 2002) it has been demonstrated that both the magnitude and the consequences of the effect of education on turnout are smaller in countries that apply this institution than in those where voting is voluntary.

Obviously this analysis has possible flaws. Most importantly, it fails to control for other individual and contextual characteristics that might alter the effect of education. Whereas I have explained my reasons to believe that under-specification of the model is not necessarily a problem as is often too readily assumed, I do believe that it is necessary to theorise further in order to specify the expected effects of other possible
control variables which accomplish the condition of being both relevant and not in part
cased by education. However, in the absence of clear hypotheses of which such
variables should be I still think that an underspecified analysis sheds satisfactory light
into the research question. On the other side, in terms of the statistical techniques used,
a multilevel model would be more appropriate given the nested structure of the data
because of the mixture of individual and system-level variables.

Another contribution of the paper is that it relies on a theoretically grounded
understanding of the way education works. Education provides citizens with cognitive
skills, but because voting is an easy political act the lack of such skills is not a
satisfactorily explanation of the outcome of lower turnout. Education does also place
citizens in relevant social networks and this causal mechanism is possibly more
powerful than the former one. This point was made by Nie, Junn, and Stehlik-Barry
(1996) and in my opinion this is an important, but neglected one. The relative education
measure has been used here in a rather exploratory way. There are alternative ways to
employ it which should be tested in further empirical cross-national analyses of turnout.

Finally I will return to the introductory section of this paper. Turnout is declining in
most advanced industrial democracies and particularly among young adults.
Compulsory voting is surely not a solution to the underlying causes of that trend but
might be a remedy for possible problems derived from it. Even if it is a controversial
position, biases due to socio-economic and other politically relevant characteristics are
one of these problems which can be plausibly expected to grow in the future if the trend
of turnout decline and the sharpening of biases among young cohorts are not reversed. If
one thinks that participatory inequality is an issue of concern, then this paper provides
some support for the argument that compulsory voting is one possible (if perhaps only
partial) remedy to this problem.

LITERATURE

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### Tables and Figures

**Figure 1: direct and indirect effects**

<table>
<thead>
<tr>
<th>Compulsory Voting</th>
<th>Educational inequality in turnout</th>
<th>Turnout rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>direct effect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: Countries included in the analysis and survey data**

<table>
<thead>
<tr>
<th>Country</th>
<th>Compulsory voting</th>
<th>ESS (1 and 2)</th>
<th>ISSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Yes</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>Yes</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>Yes</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Greece</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>Not enforced</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Until 1967</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Austria</td>
<td>Until 1992</td>
<td></td>
<td>X*</td>
</tr>
<tr>
<td>Switzerland</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Germany</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Denmark</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Spain</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Finland</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>France</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>UK</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Ireland</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Norway</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Portugal</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Sweden</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Canada</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>No</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

* In Austria the information about the education level is only available for the second round of the European Social Survey.

**Table 2: Reported voting rates in % by relative education**

<table>
<thead>
<tr>
<th>Country</th>
<th>Low relative education</th>
<th>High relative education</th>
<th>Ratio (high / low)</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>93</td>
<td>94</td>
<td>1.00</td>
<td>93</td>
</tr>
<tr>
<td>Australia</td>
<td>97</td>
<td>98</td>
<td>1.01</td>
<td>97</td>
</tr>
<tr>
<td>Canada</td>
<td>82</td>
<td>90</td>
<td>1.09</td>
<td>85</td>
</tr>
<tr>
<td>Italy</td>
<td>85</td>
<td>93</td>
<td>1.10</td>
<td>88</td>
</tr>
<tr>
<td>Denmark</td>
<td>89</td>
<td>97</td>
<td>1.10</td>
<td>93</td>
</tr>
<tr>
<td>Belgium</td>
<td>85</td>
<td>95</td>
<td>1.11</td>
<td>90</td>
</tr>
<tr>
<td>France</td>
<td>72</td>
<td>81</td>
<td>1.12</td>
<td>77</td>
</tr>
<tr>
<td>Austria</td>
<td>82</td>
<td>91</td>
<td>1.12</td>
<td>86</td>
</tr>
<tr>
<td>Sweden</td>
<td>83</td>
<td>94</td>
<td>1.13</td>
<td>89</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>81</td>
<td>93</td>
<td>1.14</td>
<td>87</td>
</tr>
<tr>
<td>Spain</td>
<td>76</td>
<td>86</td>
<td>1.14</td>
<td>81</td>
</tr>
<tr>
<td>Ireland</td>
<td>73</td>
<td>86</td>
<td>1.18</td>
<td>79</td>
</tr>
<tr>
<td>Switzerland</td>
<td>66</td>
<td>78</td>
<td>1.19</td>
<td>70</td>
</tr>
<tr>
<td>Netherlands</td>
<td>77</td>
<td>92</td>
<td>1.20</td>
<td>85</td>
</tr>
<tr>
<td>Norway</td>
<td>78</td>
<td>93</td>
<td>1.20</td>
<td>86</td>
</tr>
<tr>
<td>UK</td>
<td>63</td>
<td>76</td>
<td>1.20</td>
<td>71</td>
</tr>
<tr>
<td>Finland</td>
<td>71</td>
<td>87</td>
<td>1.22</td>
<td>81</td>
</tr>
<tr>
<td>Portugal</td>
<td>63</td>
<td>78</td>
<td>1.23</td>
<td>73</td>
</tr>
<tr>
<td>Germany</td>
<td>72</td>
<td>93</td>
<td>1.28</td>
<td>84</td>
</tr>
<tr>
<td>United States</td>
<td>45</td>
<td>80</td>
<td>1.80</td>
<td>63</td>
</tr>
</tbody>
</table>

Source: European Social Survey 1 and 2, International Social Survey 2004

In bold: countries with compulsory voting.
Figure 2: Reported vote in % and educational inequality in turnout

\[ y = -38.505x + 128.23 \]

\[ R^2 = 0.5191 \]

Source: European Social Survey 1 and 2, International Social Survey 2004
In red: countries with compulsory voting and Italy.

Table 3: Inequality ratio by age groups

<table>
<thead>
<tr>
<th></th>
<th>Young (18-34)</th>
<th>Middle age (35-64)</th>
<th>Senior (65+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>0.97</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Australia</td>
<td>1.12</td>
<td>1.00</td>
<td>1.01</td>
</tr>
<tr>
<td>Canada</td>
<td>1.28</td>
<td>1.06</td>
<td>0.94</td>
</tr>
<tr>
<td>Italy</td>
<td>1.28</td>
<td>1.04</td>
<td>1.13</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.19</td>
<td>1.04</td>
<td>1.04</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.11</td>
<td>1.05</td>
<td>1.07</td>
</tr>
<tr>
<td>France</td>
<td>1.36</td>
<td>1.13</td>
<td>1.11</td>
</tr>
<tr>
<td>Austria</td>
<td>1.32</td>
<td>1.08</td>
<td>1.07</td>
</tr>
<tr>
<td>Sweden</td>
<td>1.24</td>
<td>1.09</td>
<td>1.08</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>1.28</td>
<td>0.97</td>
<td>1.14</td>
</tr>
<tr>
<td>Spain</td>
<td>1.19</td>
<td>1.09</td>
<td>1.10</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.43</td>
<td>1.11</td>
<td>1.04</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.38</td>
<td>1.08</td>
<td>1.23</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.27</td>
<td>1.16</td>
<td>1.17</td>
</tr>
<tr>
<td>Norway</td>
<td>1.40</td>
<td>1.12</td>
<td>1.12</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.48</td>
<td>1.19</td>
<td>1.07</td>
</tr>
<tr>
<td>Finland</td>
<td>1.43</td>
<td>1.19</td>
<td>1.12</td>
</tr>
<tr>
<td>Portugal</td>
<td>1.36</td>
<td>1.19</td>
<td>1.20</td>
</tr>
<tr>
<td>Germany</td>
<td>1.49</td>
<td>1.22</td>
<td>1.21</td>
</tr>
<tr>
<td>United States</td>
<td>3.26</td>
<td>1.45</td>
<td>1.34</td>
</tr>
</tbody>
</table>

Source: European Social Survey 1 and 2, International Social Survey 2004
In bold: countries with compulsory voting. In italic: ratio > 1.20
### Table 4: Logits of education on vote controlling for age

| Country    | Coef. | P>|z| | Valid % report vote | N  |
|------------|-------|-----|---------------------|-----|
| Greece     | -0.015| 0.463| 93                  | 4494|
| Luxemburg  | 0.049 | 0.111| 87                  | 1927|
| Australia  | 0.069 | 0.129| 97                  | 1805|
| Spain      | 0.073 | 0.000| 81                  | 2828|
| Switzerland| 0.081 | 0.083| 70                  | 3347|
| Canada     | 0.093 | 0.083| 85                  | 947 |
| UK         | 0.098 | 0.000| 71                  | 3585|
| France     | 0.105 | 0.000| 77                  | 2821|
| Italy      | 0.106 | 0.000| 88                  | 2489|
| Belgium    | 0.106 | 0.000| 90                  | 3132|
| Portugal   | 0.130 | 0.000| 73                  | 3215|
| Austria    | 0.133 | 0.000| 86                  | 3858|
| Ireland    | 0.144 | 0.000| 79                  | 3944|
| Finland    | 0.169 | 0.000| 81                  | 3588|
| Sweden     | 0.174 | 0.000| 89                  | 3579|
| Denmark    | 0.184 | 0.000| 93                  | 2718|
| Norway     | 0.184 | 0.000| 86                  | 3509|
| Netherlands| 0.187 | 0.000| 85                  | 3980|
| Germany    | 0.232 | 0.000| 84                  | 5051|
| USA        | 0.302 | 0.000| 63                  | 1453|

Source: European Social Survey 1 and 2, International Social Survey 2004
In bold: countries with compulsory voting.

### Table 5: Distribution of the countries

<table>
<thead>
<tr>
<th></th>
<th>Weak effect (≤0.120)</th>
<th>Strong effect (&gt;0.120)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low turnout (&lt;85)</td>
<td>Switzerland, Spain, UK, France</td>
<td>USA, Portugal, Ireland, Finland, Germany</td>
</tr>
<tr>
<td>High turnout (&gt;85)</td>
<td>Greece, Canada, Australia, Italy, Belgium, Luxemburg</td>
<td>Austria, Denmark, Norway, Sweden</td>
</tr>
</tbody>
</table>

Source: Own elaboration

### Table 6: Logit coefficients of the effect of relative education and compulsory voting

|                      | Coef. | z     | P>|z| |
|----------------------|-------|-------|-----|
| Relative education   | 0.123 | 26.82 | 0.000|
| Compulsory voting    | 1.287 | 31.11 | 0.000|
| Education*comp voting| -0.073| -5.68 | 0.000|
| Age                  | 0.129 | 34.53 | 0.000|
| Age squared          | -0.001| -28.52| 0.000|
| Constant             | -2.000| -23.61| 0.000|

<table>
<thead>
<tr>
<th>N</th>
<th>62270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo R²</td>
<td>0.091</td>
</tr>
</tbody>
</table>

Source: European Social Survey 1 and 2, International Social Survey 2004
In bold: countries with compulsory voting.

### Figure 3: Predicted probabilities of voting and relative education

![Graph showing predicted probabilities of voting and relative education](image)

Source: European Social Survey 1 and 2, International Social Survey 2004