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Gradient constraint in voting: the effect of intra-generational social class and income mobility on turnout

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As the connection between an individual's socioeconomic status and electoral participation originates from the socialization process in childhood and adolescence, inequalities in voting are often argued to be relatively stable throughout the life cycle. However, social mobility during adulthood may mitigate the effects of family background. Using individual-level register-based data, this study examines the extent to which changes in adults' social class and income between 2000 and 2011 influenced voting propensity in the 2012 Finnish municipal elections. The results show that turnout among socially mobile voters settles between the stable members of their socioeconomic group of origin and destination. Our findings imply that intra-generational social and economic mobility can constrain the socioeconomic gradient in turnout.

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Highlights

- We study the effect of intra-generational social mobility on voting
- Turnout among the upwardly mobile is higher compared to their group of origin
- Turnout among the upwardly mobile is lower compared to their group of destination
- The opposite holds for the downwardly mobile individuals
- Social mobility functions as a mechanism that reduces inequality in voting

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Introduction

As widely recognized among scholars of political behavior, various forms of social inequality are directly reflected in political participation (Wass and Blais, 2016). An important aspect of this phenomenon relates to inter-generational transmission of disadvantage. Patterns of participation are passed on from parents to offspring through learning from parental behavior and transmission of socioeconomic resources (e.g. Bhatti and Hansen, 2012; Brady et al., 2015; Cesarini et al., 2014; Gidengil et al., 2016; Pacheco, 2008; Pacheco and Plutzer, 2008; Quintelier, 2015; Verba et al., 2005). Furthermore, differences in levels of political activity seem relatively persistent during individuals' life cycles (Brady et al. 2015; Plutzer 2002), which implies that inequalities originating from pre-adult characteristics may cause a permanent bias in participation (Gidengil et al., 2016).

In this study, we argue that the overall picture might not be so gloomy. If social and economic resources received later in life can compensate for uneven pre-adult prerequisites for political participation, intra-generational social mobility would mitigate the inequalities stemming from childhood conditions. Although acknowledged in the previous literature (Brady et al., 2015), the potential effect of intra-generational social mobility has not yet been examined empirically. More specifically, we concentrate on the gradient-constraint hypothesis, originally discovered in population health studies (Bartley and Plewis, 1997; 2007; Blane et al., 1999; Elstad, 2001; for adaptation to another field, see Plewis and Bartley 2014). Applied to electoral participation, gradient constraint would mean that turnout among upwardly mobile individuals is higher compared to the stable members of their class of origin but lower compared to their class of destination. The situation would be reversed among those whose class status has shifted downwards. As a result, these two types of social mobility would reduce the socioeconomic bias in electoral participation.

To test the gradient-constraint hypothesis, we use a unique dataset that links individual-level voting records from the 2012 Finnish municipal elections with information on socioeconomic background characteristics compiled by Statistics Finland. On the bases of personal identification codes, individuals' social class and income in 2000 and 2011 are matched to voting in the 1999 Finnish parliamentary elections in the dataset. Using actual voting records means that our data are not subject to the bias characteristic to self-reported turnout, such as misreporting due to faulty recall, or over-reporting due to social desirability (Karp and Brockington, 2005; Swaddle and Heath, 1989). Also, the over-reporting of turnout related to the self-selection of the survey respondents (Sciarini and Goldberg 2016) is avoided. Neither do the data suffer from potential misreporting stemming from respondents' recollections of their past social class and income.

In what follows, we first discuss the concept of gradient constraint and its applicability in the study of turnout. Next, the data and research design are introduced, followed by presentation of our main results. We conclude by discussing the implications of the findings.

Gradient constraint and voting

Originally, the concept of gradient constraint was developed in the field of health inequalities. Its basic logic is relatively simple, reflecting the association between an individual's health status

and socioeconomic position. As the original socioeconomic composition of healthy and less healthy citizens differ from each other, social mobility takes place between social groups with different levels of health (Bartley and Plewis, 1997, 377). A gradient-constraint hypothesis assumes that the health status of the upwardly mobile is better compared to members of their original social class but worse compared to members of their new class. Correspondingly, those moving downwards have worse health profiles than those who stay in their previous social class, although they are still healthier than stayers in their social class of destination. Should this be the case, social mobility mitigates the health disparities between different social classes (Bartley and Plewis, 1997).

In his contribution, Elstad (2001) argued that the social class-health association has to meet three prerequisites in order to have such an alleviating effect: 1) there should be considerable differences in outcome, 2) the overall rate of intra-generational social mobility in the population needs to be high, and 3) there should be a clear direction of causation. Although the gradient-constraint hypothesis has not been tested with regard to political participation and voting, the class-turnout case fulfills these conditions.

First, numerous studies have reported a class bias in turnout (for review, e.g. Wass and Blais, 2016). Besides age and socio-psychological factors, such as religiosity, party identification and political interest, electoral participation is strongly connected to an individual's socioeconomic position, demonstrated by sharp differences in voting probabilities between various social classes and income groups (e.g. Leighley and Nagler, 2013; for Finland, see Martikainen, et al. 2005).

The second criterion, concerning the volume of mobility, is more difficult to assess on the basis of previous research. Unlike inter-generational mobility rates, for which country-specific differences are well documented, comparable literature on intra-generational mobility is not available, probably due to far more demanding data requirements (Breen, 2004, 3). As a small and open economy, Finland is a dynamic society in which education is state-subsidized and other welfare-state benefits promote social mobility (Kvist et al. eds., 2012). This provides grounds to assume at least reasonable levels of intra-generational mobility. Due to lack of appropriate international comparisons, we will rely on our own data to test the level of mobility later in the analysis.

Thirdly, the direction of causality between class and turnout is relatively clear. Although some studies have considered voting as an indicator of social capital (e.g. Macinko and Starfield, 2001), it seems quite unlikely that voting would contribute to social and economic mobility rather than the other way around. However, it is not sufficient only to exclude the possibility of reverse causation. In addition, the possibility of spurious association should be excluded. There should be certain correlates of voting that are influenced by social mobility. We argue that both permanent and changeable factors account for a person's propensity to vote in elections (Table 1). Whereas the stable elements in voting help to understand why the behavior of the socially mobile resembles that of their class of origin, the changeable elements help to understand why the behavior of movers resembles that of their class of destination.

TABLE 1 ABOUT HERE

Biologically hereditable predispositions, differences in pre-adult political socialization, habitual character of voting and achieved level of education are the key factors contributing to the stable component in voting. A number of studies argue that there is a genetic predisposition to vote (Deppe et al., 2013; Fowler et al., 2008; Fowler and Dawes, 2008; for the opposite result, Charney and English, 2013). Moreover, parents, whether biological or not, have a strong role as socialization agents (Cesarini et al., 2014; Gidengil et al., 2016). Parents may encourage their offspring to vote either by example or via verbal advice (Wass, 2007). Consequently, the parental factors affecting the tendency to vote are likely to be partly biologically inherited and partly socially learned.

In addition, the habitual character of voting (for review, see Aldrich et al., 2011) enhances stability in participation patterns. An individual's first few elections are highly important in developing a voting habit (Franklin, 2004). Those who have adopted the habit of voting in early adulthood usually continue to vote whereas the opposite holds for early non-voters (Plutzer, 2002).

Achieved level of education is one of the strongest individual-level correlates of voting. Although its causal effect on turnout has recently been debated (e.g. Kam and Palmer, 2008; for a review Persson, 2015), education is associated with several indicators of political engagement, such as sense of civic duty, civic skills, political knowledge and political efficacy (Jackson, 1995; Persson, 2015). All of these increase an individual's propensity to vote.[1]

Turning to changeable elements in voting patterns, social class and income can be expected to influence voting via various mechanisms. These include resources, social networks, trust in political institutions, as well as assessment of social status and anxiety related to it (Table 1). Social class and income affect many resources that are relevant in accounting for participation, especially money and job skills (Brady et al. 1995). Changes in occupational positions lead to the development of novel skills. The skills required in more prestigious occupations are often those that also tend to foster participation (Brady et al., 1995; Wolfinger and Rosenstone, 1980, 22). Income is another factor closely related to social class position (Goldthorpe and McKnight, 2006). By definition, higher income increases an individual's economic resources.

As higher social class is related to more extensive and intensive formal social networks (Pichler and Wallace, 2009), upward social mobility is likely to increase an individual's propensity to become politically mobilized through churches, voluntary associations and political organizations (Rosenstone and Hansen, 2003, 32; Verba et al., 1995, 16–17). In addition, the character of informal social networks might change as a result of social mobility. Exposure to informal social networks in which voting is more common might boost a group pressure to participate and thus help an individual to develop a sense of civic duty to vote even if such a duty has not been acquired earlier in life.

Changes in social status due to social mobility may also have an impact on voting through psychosocial factors, which can affect political efficacy. In population health research, poor health and well-being among groups situated lower in the hierarchy has been explained by a widespread sense of inferiority and stress (Delhey and Dragolov, 2014; Layte and Whelan, 2014). Applied to political engagement, status and status anxiety can affect both external and internal political efficacy. Achieving a higher social status may empower an individual to think that

he/she is able to influence what the government does (external efficacy) as well as increase their self-confidence in assessment of politics (internal efficacy). There is also a clear social class gradient in trust of institutions and politicians (Kouvo, 2010), which may be related to political efficacy, cultural similarity and social networks. In turn, a higher level of institutional trust increases turnout (e.g. Cox, 2003; Grönlund and Setälä, 2007).

To summarize, the presence of both stable and changeable elements (Table 1) makes it plausible to assume the presence of gradient constraint in voting. This would imply that turnout among upwardly/downwardly socially and economically mobile individuals would settle between their socioeconomic group of origin and destination. The gradient-constraint hypothesis can be further disentangled into four interrelated components:

1) *The upwardly mobile individuals are more likely to vote than the stable members of their socioeconomic group of origin*
2) *The upwardly mobile individuals are less likely to vote than the stable members of their socioeconomic group of destination*
3) *The downwardly mobile individuals are less likely to vote than the stable members of their socioeconomic group of origin*
4) *The downwardly mobile individuals are more likely to vote than the stable members of their socioeconomic group of destination*

We study intra-generational social mobility using two indicators of socioeconomic position, namely social class and income. The literature on gradient constraint has usually addressed occupational social class mobility, following the conventions of the sociological tradition in social stratification and mobility research (Erikson and Goldthorpe, 2002). Methodologically, change in social class can be specifically defined, which makes it a highly accurate measure of social mobility. In contrast to measures of income, for instance, class definition is more stable over time. Social class proxies main economic activity and also has a direct connection to an individual's economic resources and social networks. Social class is also an interesting factor in turnout studies because of, for instance, its close connection to class voting (i.e. whether working class and middle class citizens have distinct party preferences).

In addition of social class mobility, we examine the effect of income mobility. Besides having an independent effect on turnout (Martikainen et al., 2005; Wolfinger and Rosenstone, 1980, 23–26), income-related representational bias in parliamentary institutions is of major importance. Income is directly related to an individual's position in important policy issues, such as level of welfare benefits or tax rates (Leighley and Nagler, 1992; 2013, 24). The interests of more affluent citizens often become better represented in political decision-making (for a review, Enns and Wlezien, 2011). Revealingly, income has been used as an independent variable in turnout studies more often than social class during the past decade (Smets and van Ham, 2013).

Data and methods

Our analyses are based on individual-level turnout data in the 2012 Finnish municipal elections. The data were compiled from those electoral wards that utilized electronic voter registration. These 211 electoral wards out of 2,265 covered 13.6 percent of the entire electorate (n=585,839

individuals). The data, administered by the Ministry of Justice, were released to Statistics Finland after the elections. In Statistics Finland, the information on whether a person voted or not was linked to information on the individual's occupation-based social class and income (measured in 2000 and 2011) as well as several other sociodemographic characteristics on the basis of personal identification numbers.

Municipalities could decide themselves whether they preferred to use electronic registers and in which electoral wards. Since systematic random sampling was not applied in the selection the wards, the representativeness of the data to the Finnish electorate might be an issue. However, according to our diagnostics, the data are highly representative. Turnout rate in our data is one percentage point lower than the official turnout (57.3% vs. 58.3%, respectively). The distributions of gender, mother tongue, marital status and education also match reasonably well to official registers. Measured in the end of 2011, each category in each variable is less than one percentage point biased with two exceptions: the Swedish-speaking population is overrepresented by 1.7 percentage points and the population with secondary-level education is underrepresented by 1.3 points.

The social class schema used here is based on the European Socio-economic Classification (ESeC, Rose and Harrison, 2007), which was formed on the basis of the ISCO88 codes[2] of an individual's current or previous occupation. For the sake of interpretability and hierarchal ordering, the original nine-class schema was collapsed using the five-class version of the model (Rose et al. 2010, 21). The self-employed classes (ESeC 4 and 5), accounting for eight percent of the total population, were further excluded from the analysis.[3] Besides making hierarchical comparison easier, this was necessary because the dataset does not include a variable indicating self-employment status. Measuring self-employment (especially ESeC 4 class) is, in turn, unreliable based solely on ISCO-codes. Our classification thus includes the following four categories: 1) *"salariat"* (professional, managerial and administrative occupations, i.e. ESeC 1 and 2), 2) *"intermediate"* (higher grade white-collar, lower supervisory and lower technician occupations, i.e. ESeC 3 and 6), 3) *"sales and service"* (lower services, sales and clerical occupations, i.e. ESeC 7) and 4) *"manual"* (lower technical and routine occupations, i.e. ESeC 8 and 9). Although the ESeC class schema is not meant to be necessarily hierarchical, here classes are ordered according to their voting propensities (class 1 is the most active whereas class 4 the least active).

We measure income as an individual's taxable income, which is derived from national tax records. It includes salary from paid work, income received from investments, pensions and most of the welfare benefits. Income is further ranked for both 2000 and 2011 as quartiles within the study population, in which the first quartile indicates the highest and the fourth quartile the lowest category of income. Ranking to quartiles instead of a continuous measure is chosen in order to facilitate comparisons. In addition, it is not reasonable to assume income mobility to be linearly associated with turnout, as income per se is not (Martikainen et al., 2005; Wolfinger and Rosenstone, 1980).

The analyses are conducted in three phases. First, in order to demonstrate the validity of our analysis, we assess the overall level of mobility in social class and income. The method of analysis is descriptive cross-tabulation.

Second, we conduct pairwise comparisons between movers and stayers in each category of social class by examining how turnout compares among movers between 2000 and 2011 with the turnout of the stable members in their social class of origin and destination. Third, the same analysis is performed using income as an indicator of mobility instead of social class.

For second and third analysis, we ran a series of logistic regression models with the results reported as estimated voting probabilities for each mobility (and immobility) group dummies when holding control variables as observed (Hanmer and Kalkan, 2013). Logistic regression models were adjusted for gender age, education, voting in the 1999 parliamentary elections, and father's and mother's voting in the 1999 parliamentary elections. These variables are included in the model in order to encompass the stable factors, discussed in the previous section (Table 1).[4] See Table A1 in the appendix for the distribution of the variables and turnout in each category of them.

Education was measured at the end of 1998 and included four categories: 1) lower secondary (maximum nine years of education), 2) upper secondary (vocational school or academic upper-secondary school), 3) lower degree level tertiary (2 to 4 years after the upper secondary level, vocational college, polytechnic or bachelor degree), and 4) higher degree-level tertiary (master or doctoral level degree).

Data on voting in 1999 is derived from a unique data set compiled by Statistics Finland. The 1999 data include the entire mainland Finnish electorate (for more information, Martikainen et al., 2005). Parental voting is used as a proxy for pre-adult intra-family political socialization, whereas an individual's previous voting is used as a proxy for a habitual tendency to participate in elections. Parental voting is represented in five categories: 1) neither parent voted (which includes cases in which only one parent was alive but did not vote), 2) only the father voted 3) only the mother voted 4) both parents voted (or only one parent was alive and voted), and finally 5) both parents were dead at the time of elections. An individual's previous voting is a dummy variable.

The analyses are limited to 30- to 48-year-olds at the end of 2000 who are followed up to 2012 (i.e. 41- to 59-year-olds at the end of 2011 and 41- to 60-year-olds by the time of the 2012 municipal elections held in October). According to previous literature, individuals begin to show maturity in terms of occupational attainment at their early 30s (Härkönen and Bihagen, 2011). On the other end, high rates of retirement after the age of 59 may bias the results, especially in the income analyses. Furthermore, in older age groups, the number of individuals with missing information on both parental voting and death grows rapidly. In our analyses, 11 percent of individuals were excluded as the result of missing parental information. This slightly skews our population in the oldest age groups. The proportion of 45–48 year-olds in our study would be 2.2 percentage points higher without this exclusion (cf. Table A1), since older cohorts had an increasing number of missing parental data. The final sample includes 143,322 individuals for social class analyses and 150,709 for income analyses.

The sensitivity analyses are conducted in three phases. First, we ran logistic models that include aggregated mobility variables instead of pairwise comparisons. This is done in order to assess the overall effect of mobility instead of specific pairs-wise comparisons and to compare the effect sizes between social class and income mobility. The advantage of this approach is that it enables

a more straightforward overall assessment of our hypothesis since there is a single coefficient that summarizes each of the four components of our hypothesis. The downside is that the results are more vague than when looking at each pair separately. Additionally, we ran this analysis stratified in two age groups, namely between 30-38-year-olds and 39-48-year-olds. Mobility among individuals in their thirties can still have a different character than among a population ten years older. It is possible, for example, that the youngest few cohorts have not achieved the sufficient occupational maturity, and hence play disproportionately large role in our results.

Second, the analyses are replicated with a corresponding dataset from the 2015 parliamentary elections. In these elections, the electronic voting register included 1,081,814 individuals (24.2% of the total electorate) from 402 electoral wards and from 115 municipals. Turnout among the sample is 0.9 points lower than the official rate for the citizens living in Finland (69.2 vs 70.1 %). The distributions of gender and marital status match official registers closely: each category in both variables is biased by less than half a percentage point. However, education is biased towards secondary level qualifications by 2.0 percentage points.

The 2015 dataset also included information on whether an individual was an employee or self-employed, which produced a slightly more accurate measurement of social class. However, the results in 2015 elections change only marginally if we measure social class in a similar fashion as in the 2012 dataset (i.e. without information of self-employment, analysis not shown). Moreover, measurements of social class were made on the last day of 2000 and 2013, which causes some gap between the end of our follow-up and the election day in April 2015. This is nevertheless unlikely to produce a systematic bias to either direction, and compared to the length of the total follow-up period (13 years), this is still a relatively short episode. In turn, income was available in 2000 and 2014.

Control variables (gender, age, education, voting in the 1999 elections and parental voting in 1999) were essentially similar in both datasets. However, education was measured in 2000 instead of 1998. The study population in the 2015 analysis covers those between 30- and 45-year-olds in 2000. Compared to the main analysis, a slightly different age frame was chosen in order not to exceed the 59-year old age limit at the end of the follow-up. The final sample includes 192,154 individuals for social class analysis and 234,767 for income analysis.

In the final analysis, we aim to further interpret observed differences between contexts and socioeconomic measures by employing diagonal reference models (Sobel 1981, 1985), which have become the standard approach in the research of social mobility effects. Although they are not used widely in the gradient-constraint literature, these are used in order to gain further insight on the observed differences between the results our four contexts (2 elections x 2 SES measures). The analyses for both elections and socioeconomic indicators include two models. First, we test the relative weight of group of origin and destination for overall population. In the second model, we specify separate weight parameters for the upwardly and downwardly mobile individuals. The set of first logistic diagonal reference models can be presented as follows:

$$\mu_{odi} = p\gamma_o + (1-p)\gamma_d + \left(\sum \beta_b x_{bi}\right)$$

where μ is the estimated log odds of voting in cell od which has i observations, γ_o is the social class / income quartile of origin and (identically coded) γ_d is the social class / income quartile of destination, $\sum \beta_b x_{bi}$ are the control variables (gender, age, education and own and parental voting in 1999). The weight term for the position of origin is *p* ($\in$ [0,1]). Correspondingly, the destination weight is *1-p*. More substantially speaking, if p> 0.5 the origin has a larger effect than the destination and if p<0.5 the destination matters more. The situation where destination has no effect corresponds the p of 0 whereas p=1 indicates the situation in which origin has no effect.

Second, to address whether there are differences between the effects of upward and downward mobility, we specify the following models:

$$\mu_{odi} = (p + m_{up} + m_{down})\gamma_o + (1 - (p + m_{up} + m_{down}))\gamma_d + \left(\sum \beta_b x_{ijb}\right) + \varepsilon_{ijk}$$

where $p + m_{up}$ is the weight of origin for upwardly mobile (i.e. if *o*>*d*), $(p + m_{down})$ is the weight of origin for downwardly mobile (if *o*<*d*). Finally, the weight parameter *p* is required for the estimation but, as having no substantial interpretation, it is not reported. Diagonal reference models were conducted using the gnm package in R (Turner and Firth, 2007), while all the other analyses have been performed with Stata13.

When reporting our findings, we concentrate on the 2012 data and report the results from the 2015 data mostly in the appendix. This is since the observed pattern with the 2012 data is more consistent and hence more illustrative. However, the replication with the 2015 data reveals additional insights, which suggest that the effect of social and income mobility on voting is a more multifaceted phenomenon that appears to be the case on the basis of 2012 data. By including another electoral context, we have provided a more stringent test to our hypothesis.

Results

Main analysis

TABLE 2 ABOUT HERE

We begin the analysis by examining the magnitude of social-class and income mobility. Table 2 shows that social class and, even more so, income mobility is relatively common among individuals in their thirties and forties. Of our study population, between 2000 and 2011 as many as 25 percent had experienced social class mobility and 45 percent has experienced mobility in their income ranking. In addition, social class and income discrepancies in turnout are clearly visible. The difference in turnout between the lowest and the highest category on both of these measures is 23 percentage points in the 2012 Finnish municipal elections.

TABLE 3 ABOUT HERE

In Table 3, we assess our hypothesis by comparing the absolute turnout of each social class or income quartile pair and combination of the mobility between them between 2000 and 2011

based on cross tabulation. For instance, the highest row of the Table 3 shows that the voting propensity of those who belonged in the salariat in both 2000 and 2011 was 79 percent. The cell also shows a voting rate of 76 percent for those who were in the intermediate class in 2000 and the salariat in 2011, 75 percent for those who were in the salariat in 2000 and the intermediate class in 2011 and finally 69 percent for those who were in the intermediate class both in 2000 and 2011.

Overall, the descriptive results seem to lend support for all the four components of gradient-constraint hypothesis in a clear-cut manner. The upwardly mobile individuals are more likely to vote than the stable members of their socioeconomic group of origin. The upwardly mobile individuals are less likely to vote than the stable members of their socioeconomic group of destination. The downwardly mobile individuals are less likely to vote than the stable members of their socioeconomic group of origin. The downwardly mobile individuals are more likely to vote than the stable members of their socioeconomic group of destination. This pattern can be observed when using either income or social class as an indicator of socioeconomic status. Interestingly, the upwardly mobile have a higher propensity to vote than the downwardly mobile with three exceptions, namely when mobility occurs between lower sales and service and manual classes and between intermediate and manual classes or between highest and third income quartile.

FIGURE 1 ABOUT HERE

Figure 1 shows the turnout propensity of each social class pair and combination of the mobility between them between 2000 and 2011. Corresponding logistic regression models are reported in the appendix (Table A2). This time, each combination of social class or income quartiles has a vertical "block" of its own. For instance, the cell in the furthest left in the upper part of the figure reveals that the voting propensity of those who belonged in the salariat in both 2000 and 2011 was 69.8 percent. Turnout rate was 70.2 percent for those who were in intermediate class in 2000 and salariat in 2011, 69.6 percent for those who were in salariat in 2000 and intermediate in 2011 and finally 66.2 percent for those who were in intermediate class both in 2000 and 2011.

Compared to descriptive results (Table 3), the differences in Figure 1 are much smaller, which seems logical since we included strong controls. This analysis can even be interpreted as a conservative test, since education in particular is not only correlated with voting in the 2012 elections and an individual's baseline social class or income quartile, but also his/her potential for future social mobility (Härkönen and Bihagen, 2011; Manzoni et al., 2014).

For social class, the general pattern that socially mobile individuals' turnout is between the stable members of their class of origin and destination persists in most cases. However, the difference is not significant in 9 out of 24 possible comparisons between the mobile groups and the corresponding stable groups at 95 percent confidence level. Most remarkably, the difference between stable intermediate and lower sales and service classes becomes insignificant and the relation to mobility between them spurious. In addition, turnout among mobile groups between the salariat and intermediate is as high as among the stable members of the salariat. This holds also when comparing the upwardly mobile from lower sales and service to the salariat to the stable members of the salariat.

When income is used as a measure of socioeconomic status instead of social class (lower part of the Figure 1), the overall picture becomes even clearer. Turnout among the mobile individuals always settles between the stable members of their income quartile of origin and destination. The difference is not significant in five out of the 24 possible comparisons between mobile and stable groups. These include the upwardly and downwardly mobile between quartiles 1 and 2 relative to stable 2, the upwardly and downwardly mobile between quartiles 2 and 3 relative to stable 3 and the upwardly mobile between quartiles 1 and 4 relative to stable 1.

While detecting a general pattern is interesting per se, the obvious next question concerns effect sizes. One possible way to illustrate them is a comparison between the impact of social mobility and other factors. The estimation of voting probabilities from the same models of which Figure 1 is based (including gender, age, education, voting in the 1999 elections and parental voting in 1999, see Table A2) shows that the variation in difference in turnout between the upwardly mobile is 6.6 percentage points at the highest (from salariat to manual). The corresponding figure for the downwardly mobile is 5.3 points. This becomes close to the direct effect of having parents who both voted in the 1999 elections compared to non-voting parents (the difference of +7 point) (analysis not shown here).[5] Mobility from manual to intermediate class compared to stable members of manual class (+4.3 points) or from lower sales and service to salariat compared to stable sales and service (+4.0 points) is comparable with the effect of having a mother who voted compared to parents who neither voted (+4.0 points).

Post-estimation from the income models reveals that the effect of moving from the lowest to the third income quartile (+ 4.2 points) is higher than that having a mother who voted compared to the reference group of having non-voting parents (+3.5 points). Correspondingly, moving from the lowest to the second quartile (+6.9 points) equals the positive effect of having two voting parents (+7.0 points). Upward mobility between the highest and lowest quartiles has an even stronger effect (+12.6 points).

Finally, we evaluate the degree of how much intra-generational social mobility can narrow the overall social class and income gradient in turnout. Table 4 presents the estimated turnout differences between social classes / income quartiles in 2011 and compares how much smaller the difference is compared to the turnout of only stable individuals of corresponding groups. For example, with only stable individuals, the gap between salariat and manual classes would be 11.2 per cent larger (1-(69.4-61.5)/(69.8-60.9)), and difference between highest and lowest income quartile would be 21.1 per cent larger than it is with all individuals included.

Sensitivity analyses

As a robustness check, we also present additional analysis, which includes aggregated mobility variables instead of pairwise comparisons (Table A3). Gradient constraint can also be detected here. The upwardly mobile are more active voters and the downwardly mobile more passive than the average members of their social class/income group of origin in 2000 (models in the first and third column). This addresses the first and third component of our hypothesis. To address the second and fourth component of our hypothesis, we need to compare the effect of mobility relative to their position of destination, which are shown in the second and fourth columns of Table A3. Here the upwardly mobile are still less active voters relative to their group of

destination. Correspondingly, the downwardly mobile are more active voters relative to their group of destination. Hence, the analysis in Table A3 validates all four components of our hypothesis.

In Figure 1, using income as an indicator of socioeconomic position seems to lend stronger support for the gradient-constraint hypothesis compared to using social class as an indicator, and the results of Table 4 also suggest that income mobility narrows the differences between groups more than social class mobility. On the other hand, logistic regression models in Table A3 suggest coefficients of roughly equal size. The differences might be related to two factors. First, there is more absolute income than social class mobility. Analysis in Table A3 obviously suffers much less from random variation arising from small cell sizes in mobile groups. Second, the stable highest and lowest income quartiles are of much smaller size and thus more selected than corresponding social classes (see Table 2). This causes larger difference between extreme groups and hence leaves more room for mobility effects.[6] Moreover, this analysis suggests that upward mobility has a slightly stronger effect on turnout than downward mobility for social class, but not for income.

Whether the results are robust according to the selected age frame is analyzed in Table A4. The age-stratified analysis shows similar patterns between 30-38-year-olds and 39-48-year-olds. If anything, results among the older age group are more consistent to our hypothesis.

Appendices A5 to A12 show identical analysis conducted with the data from the 2015 parliamentary elections. In the case of income, the pattern is in line with gradient-constraint hypothesis and even clearer than in the 2012 elections. Figure A7 shows that turnout among mobile individuals lies between stable members of their quartile of origin and destination and the difference between mobile and stable groups is statistically significant in every comparison.

However, mobility in social class seems to support the hypothesis only partly. More precisely, deviance from the expected pattern can be detected among the upwardly mobile individuals, whose turnout is even higher than among the stable members of their class of destination in two cases, from intermediate to the salariat and from sales and service to intermediate. Also, in tables A11 and A12, the upwardly mobile do not have significantly lower levels of turnout relative to their class of destination measured in 2013. This observation does not lend support for the second component of the gradient constraint hypothesis, namely that upwardly mobile individuals are less likely to vote than stable members of their socioeconomic group of destination.

In order to further investigate the observed differences between these four contexts, we estimated the relative weight of the positions of origin and destination with diagonal reference models (Sobel 1981, 1985). The weight parameters p and 1-p in models 1 of Table A13 show that the group of origin (p) accounts for roughly one third of the differences, while the group of destination (1-p) accounts for two-thirds in each case.[7] However, the picture changes if we specify separate weights for the upwardly and downwardly mobile individuals, as is done in Models 2 (see also Figure A14). Here, social class and income mobility in 2012 and income mobility in the 2015 elections look similar to each other, with the weight of the group of origin ranging between 41 and 45 per cent for the downwardly mobile and between 27 and 29 per cent for the upwardly mobile. The case of social class mobility in the 2015 elections forms an exception. Here it is the higher social class position (rather than the class of destination) that

matters more compared to the other three contexts. In 2015, higher social class position accounted for 56 percent of the effect for the downwardly mobile and 86 percent for the upwardly mobile. The contextual difference is also seen in the likelihood-ratio tests between nested models 1 and 2 which gave greatest statistical significance for social-class mobility in 2015 ($p<0.000001$). The difference between income models is also significant in 2015 ($p=0.0006$), whereas in 2012 the difference between models are not significant with either measure of socioeconomic position ($p=0.06$ for social class and $p=0.09$ for income).

Conclusions

To our knowledge, this study is the first attempt to test the effect of intra-generational socio-economic mobility in electoral participation. Using a rich register-based individual-level dataset from the 2012 Finnish municipal elections, turnout among socially mobile citizens was compared to turnout among stable members of their social class or income group of origin and destination. The results show that both social class and income mobility have clear associations with voting. Turnout rates among the mobile individuals settle between the averages of the members of their social class or income group of origin and destination who did not experience social mobility during the period covered in our analysis. This supports the gradient-constraint hypothesis. The pattern mostly remained after adjusting for education and own and parental voting in the 1999 parliamentary elections, especially in the case of income mobility. Finally, for both social class and income mobility, the upwardly mobile are generally more active voters than the downwardly mobile, although the differences are not significant in many cases.

As known on the bases of previous studies, a considerable proportion of social stratification in voting is attributable to inter-generational political socialization within the family and other factors situated in adolescence. Some scholars have even suggested that education, often the strongest correlate on voting among the components of socioeconomic status, merely proxies pre-adult characteristics (Kam and Palmer, 2008; for review, Persson, 2015). Although our results do not directly address education, they suggest that changes in adult socioeconomic position indeed matter for voting. An individual's social class and income position are connected to the turnout propensity in a fashion that is not fully attributable to education, voting in past elections, parental voting or former social class or income. Rather, the results suggest that individuals have a tendency to adjust their participation patterns to correspond to the standards of their new social standing. However, it should also be noted that the new position does not completely transfer into electoral participation, which is logical given the importance of the pre-adult and early adulthood elements.

Assuming that the suggested changeable mechanisms presented in Table 1 vary with changes in social class and income and play any role in accounting for turnout, intra-generational social mobility functions as an ongoing mechanism that narrows turnout inequalities between social classes and income groups. That is, disparities in turnout would be even more pronounced in the hypothetical situation in which each individual's social position would remain fixed at the point they turn 30, for instance. Also, the importance of our findings is underlined by the fact that social class mobility was a relatively common and income mobility even more common phenomenon during the eleven-year period covered in our analysis.

Finally, our sensitivity analyses show a clear pattern of gradient constraint also in the Finnish parliamentary elections of 2015 for income mobility but only partly so for social class mobility. In the latter case, the higher class position had a greater effect for an individual's voting propensity regardless of whether it was the class of origin or destination. It is quite difficult to interpret what would cause these differences in results between indicators in 2015. In this study, we were not able to solve the issue whether the observed differences are attributable to the type of the elections or some other issue. However, the results point out the multi-faceted nature of this phenomenon, especially that the nature of social mobility effects on voting cannot be captured with only one indicator. Overall, we encourage further research on the topic about the specific ways different socioeconomic indicators influence voting in different electoral contexts. Finally, the results concerning social class mobility effect on voting in 2015 are also reassuring for political participation, even if from a somewhat different perspective. If the higher class is what counts even for the downwardly mobile, it implies that increasing levels of social mobility can lead to a higher level of overall turnout.

Although register-based data used in this study entail obvious strengths, such as longitudinality, accuracy and statistical power, there are also restrictions in our analyses concerning the selection of the variables. When controls are added, it is well possible that we also control for some of the effect we aim to capture (i.e. the effect of mobility). Especially education has an effect not only on baseline social class/income quartile and turnout but also for the potential of social mobility during the follow-up. Another potential confounder is social mobility occurring between the end of 2011 and Election Day in October 2012. As this period is relatively short, the magnitude of mobility that remains uncovered is expected to be limited. Finally, the dataset does not include attitudinal factors such as sense of civic duty, political efficacy, trust in political institutions or indicators of social connectedness. We have suggested that changes in these factors may explain the changes in turnout among socially mobile individuals. Empirical tests for these mechanisms will thus be a subject for the future studies.

As always in the case of country-specific studies, the degree of country-context sensitivity in our results should be tested. Societal significance of intra-generational mobility as a mechanism that suppresses turnout differences is related to at least two context-specific factors, namely overall inequality in turnout and level of social mobility. We argue that Finland constitutes a fairly good, although by no means exceptional, case according to both of these standards. In a global comparison, Finland has a relatively high rate of polarization in turnout when measured by income (Kasara and Suryanarayan, 2015, Fig. 1). This is also the case when using social class as a measure, at least when compared to other Nordic countries (Bengtsson et al., 2014, 52–55). Finland also has a quite high level of occupational mobility among the recent labor market entrants (Gangl, 2003). However, the level of combined occupational class and contract mobility among working-aged male population was somewhat lower than the EU average (Muffels and Luijkx, 2008). Intra-generational income mobility, too, was lower than average in an analysis of 12 EU countries (Pavlopoulos et al., 2010).

To conclude, our results suggest that in order to understand unevenly distributed turnout, changes taking place later in the life-cycle should be considered along with the pre- and early-adulthood factors. Moreover, it is important not only to study factors that cause inequalities in participation but also those that suppress them. As intra-generational social mobility has the tendency to

alleviate inequalities in voting, achieving an open society with a higher level of mobility may narrow the socioeconomic gradient in turnout.

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Tables and figures

Table 1 Stable elements after early adulthood and changeable elements due to intra-generational social mobility.

Stable elements	Changeable elements
Genetic factors Political socialization Habitual character of voting, the importance of first few elections Achieved level of education	Resources (skills, money, health) → facilitate participation Formal social networks → mobilization Informal social networks → group norms, civic duty Status anxiety → political efficacy Trust in institutions and politicians → motivation to vote

Table 2 Social class and income mobility between 2000 and 2011 and turnout in the 2012 Finnish municipal elections (%).

	Social class 2011					
Social class 2000	**Salariat**	**Intermediate**	**Sales and service**	**Manual**	**Total**	
					%	**(n)**
Salariat	81	9	3	6	100	43,169
Intermediate	22	55	13	10	100	22,255
Sales and service	12	10	65	13	100	22,604
Manual	7	4	8	81	100	55,294
Total	33	14	16	37	100	143,322
Turnout (%)	*77*	*69*	*62*	*54*	*65*	
Social class mobility between 2000 and 2011						
Upwards					14	20,398
Stable					75	106,839
Downwards					11	16,085
Total					100	143,322

	Income 2011					
Income 2000	**Highest quartile**	**2. quartile**	**3. quartile**	**Lowest quartile**	**Total**	
					%	**(n)**
Highest quartile	67	19	8	7	100	37,692
2. quartile	21	46	22	11	100	37,878
3. quartile	8	24	46	22	100	37,504
Lowest quartile	5	11	24	60	100	37,635
Total	25	25	25	25	100	150,709
Turnout (%)	*76*	*69*	*63*	*53*	*65*	
Income mobility between 2000 and 2011						
Upwards					23	34,844
Stable					55	82,486
Downwards					22	34,379
Total					100	150,709

Table 3 Turnout in the stable and mobile members of each social class and income quartile pair in the 2012 Finnish municipal elections (n: 143,322 for social class; n: 150,709 for income).

Social class mobility				
	Stable higher	Mobility up	Mobility down	Stable lower
Salariat – Intermediate	79	76	75	69
Intermediate – Sales and service	69	66	64	63
Sales and service – Manual	63	55	55	53
Salariat – Sales and service	79	71	69	63
Intermediate – Manual	69	61	61	53
Salariat – Manual	79	66	64	53

Income mobility				
	Stable higher	Mobility up	Mobility down	Stable lower
Highest – Second	78	73	71	70
Second – Third	70	67	65	64
Third – Lowest	64	59	57	49
Highest – Third	78	70	70	64
Second – Lowest	70	64	60	49
Highest – Lowest	78	69	64	49

Figure 1 Estimated turnout probability in the Finnish 2012 municipal elections (%) and 95 percent confidence intervals by social class and income quartile pairs and mobility between them (n=143,322 for social class analysis; n=150,709 for income analysis). Based on logistic regression adjusted for gender, age, education and own and parental voting in 1999 parliamentary elections (see Table A2 for coefficents).

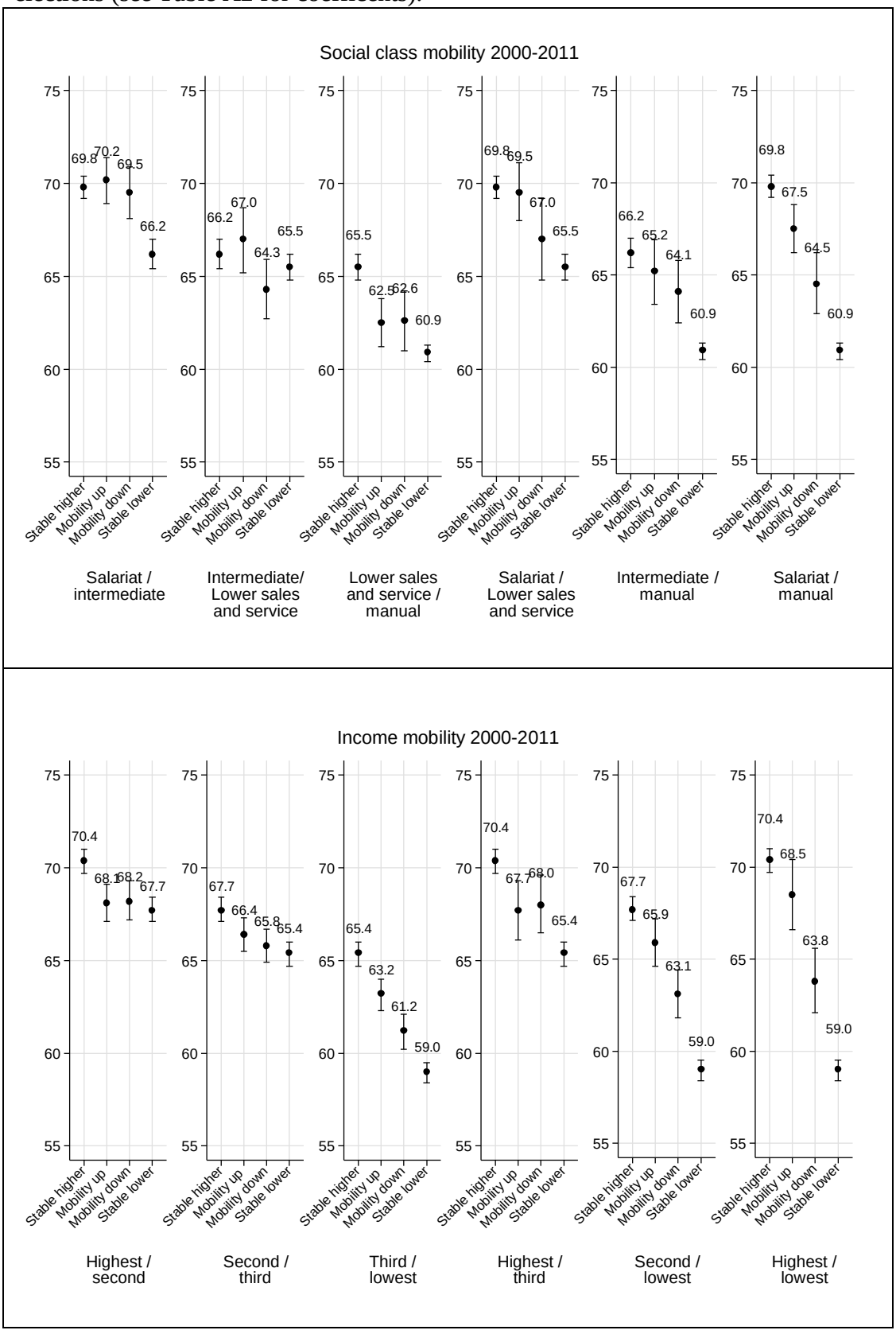


Table 4. Turnout between social classes and income quartiles in 2012 Finnish municipal elections among all and only stable individuals. Column "difference constrained" shows how much the gap is smaller for all individuals compared to only stable individuals in the reference group (salariat or highest income quartile).

Social class in 2011	Stable only		All indivduals		Difference constrained (%)
	%	95% c.i.	%	95% c.i.	
Salariat	69.8	69.2–70.4	69.4	68.9–69.8	ref.
Intermediate	66.2	65.4–67.0	66.7	66.0–67.2	25.0
Lower sales & service	65.5	64.8–66.2	64.9	64.4–65.4	none
Manual	60.9	60.4–61.3	61.5	61.1–61.9	11.2

Income quartile in 2011	Stable only		All indivduals		Difference constrained (%)
	%	95% c.i.	%	95% c.i.	
Highest	70.4	69.7–71.0	69.3	68.8–69.8	ref.
Second	67.7	67.1–68.4	67.3	66.8–67.7	25.9
Third	65.4	64.7–66.0	65.2	64.8–65.7	18.0
Lowest	59.0	58.4–59.5	60.3	59.9–60.8	21.1

Post-estimated from logit models adjusted by age, gender, education and own and parental voting in 1999 (as observed values)

Appendix

Table A1 Distributions of the control variables and turnout in each group in the 2012 Finnish municipal elections in each group.

	Social class analysis		Income analysis	
	%	Turnout (%)	%	Turnout (%)
Age in 2000				
30–34	26	60	26	60
35–39	27	63	27	63
40–44	27	67	27	68
45–48	20	71	20	71
Gender				
Male	50	63	50	64
Female	50	67	50	67
Education				
Basic	16	49	17	50
Secondary	45	60	46	61
Lower tertiary	29	75	28	75
Upper tertiary	10	85	9	86
Voting in 1999				
No	33	37	32	37
Yes	67	79	68	79
Parental voting in 1999				
Neither voted	9	49	9	49
Only father voted	4	53	4	53
Only mother voted	2	57	2	57
Both voted	72	69	72	69
Both dead	13	62	13	61
Total (N)	143,322	65	150,709	65

Table A2 Turnout in the 2012 Finnish municipal elections in social class and income mobility groups (logistic regression, log odds coefficients, standard errors in brackets).

	Social class model	Income model
Social class or income mobility (origin->destination)		
Stable 1 (ref.)	0	0
2->1	0.02 (0.04)	-0.13 (0.03)
3->1	-0.02 (0.05)	-0.15 (0.05)
4->1	-0.13 (0.04)	-0.11 (0.06)
1->2	-0.02 (0.04)	-0.12 (0.03)
Stable 2	-0.20 (0.03)	-0.15 (0.03)
3->2	-0.16 (0.05)	-0.22 (0.03)
4->2	-0.25 (0.05)	-0.25 (0.04)
1->3	-0.15 (0.06)	-0.13 (0.05)
2->3	-0.30 (0.05)	-0.26 (0.03)
Stable 3	-0.24 (0.03)	-0.28 (0.03)
4->3	-0.40 (0.04)	-0.40 (0.03)
1->4	-0.29 (0.05)	-0.36 (0.05)
2->4	-0.31 (0.05)	-0.40 (0.04)
3->4	-0.39 (0.05)	-0.50 (0.03)
Stable 4	-0.48 (0.02)	-0.61 (0.02)
Age	0.03 (0.00)	0.03 (0.00)
Gender		
Male (ref.)	0	0
Female	-0.07 (0.01)	0.07 (0.01)
Education		
Basic (ref.)	0	0
Secondary	0.26 (0.02)	0.26 (0.02)
Lower tertiary	0.58 (0.02)	0.69 (0.02)
Higher tertiary	1.00 (0.03)	1.10 (0.03)
Voting in 1999		
No (ref.)	0	0
Yes	1.59 (0.01)	1.59 (0.01)
Parental voting in 1999		
Neither voted (ref.)	0	0
Only father voted	0.05 (0.04)	0.05 (0.04)
Only mother voted	0.20 (0.05)	0.18 (0.04)
Both voted	0.39 (0.02)	0.40 (0.02)
Both dead	0.22 (0.03)	0.22 (0.03)
Constant	-1.73 (0.06)	-1.90 (0.06)
N	143,322	150,709

Table A3 Turnout in the 2012 Finnish municipal elections by social class and income and aggregated mobility coefficients (logistic regression, log odds coefficients).

	Class 2000	Class 2011	Income 2000	Income 2011
Social class or income quartile				
1 (ref.)	0	0	0	0
2	-0.18***	-0.18***	-0.17***	-0.14***
3	-0.24***	-0.28***	-0.31***	-0.28***
4	-0.46***	-0.47***	-0.55***	-0.57***
Mobility 2000–2011				
Up	0.20***	-0.06**	0.16***	-0.09***
Stable (ref.)	0	0		0
Down	-0.13***	0.11***	-0.15***	0.09***
Controls	Yes	Yes	Yes	Yes
N	143,322	143,322	150,709	150,709

Note: ***: p< 0.001; **: p<0,01; *:p<0,05.

Table A4 Turnout in the 2012 Finnish municipal elections among two age groups and mobility between them (logistic regression, log odds coefficients).

	Class 2000	Class 2011	Income 2000	Income 2011
30-38-year-olds in 2000				
Social class or income quartile				
1 (ref.)	0	0	0	0
2	-0.20***	-0.14***	-0.18***	-0.11***
3	-0.28***	-0.31***	-0.29***	-0.24***
4	-0.48***	-0.48***	-0.47***	-0.50***
Mobility 2000-2011				
Up	0.23***	-0.04	0.14***	-0.09***
Stable (ref.)	0	0	0	0
Down	-0.13***	0.11***	-0.17***	0.03
Controls	Yes	Yes	Yes	Yes
N	68,211	68,211	71,475	71,475
39-48-year-olds in 2000				
Social class or income quartile				
1 (ref.)	0	0	0	0
2	-0.16***	-0.21***	-0.15***	-0.17***
3	-0.20***	-0.25***	-0.33***	-0.32***
4	-0.45***	-0.47***	-0.63***	-0.63***
Mobility 2000-2011				
Up	0.15***	-0.09**	0.16***	-0.11***
Stable (ref.)	0	0	0	0
Down	-0.12***	0.12***	-0.16***	0.13***
Controls	Yes	Yes	Yes	Yes
N	75,111	75,111	79,234	79,234

Note: ***p<0.001, **p<0.01, *p<0.05.

Table A5 Social class and income mobility between 2000 and 2013 and turnout in the 2015 Finnish parliamentary elections (%).

	Social class 2013					
Social class 2000	**Salariat**	**Intermediate**	**Sales and service**	**Manual**	**Total**	
					%	**(n)**
Salariat	83	9	3	5	100	61,356
Intermediate	25	56	11	8	100	28,237
Sales and service	15	11	63	11	100	30,420
Manual	7	4	8	81	100	72,141
Total	36	14	15	35	100	192,154
Turnout (%)	*87*	*81*	*72*	*65*	*76*	
Social class mobility between 2000 and 2013						
Upwards					15	28,429
Stable					75	144,882
Downwards					10	18,843
Total					100	192,154

	Income 2014					
Income 2000	**Highest quartile**	**2. quartile**	**3. quartile**	**Lowest quartile**	**Total**	
					%	**(n)**
Highest quartile	64	19	9	8	100	59,013
2. quartile	22	43	23	13	100	59,616
3. quartile	9	26	43	22	100	58,015
Lowest quartile	6	13	25	56	100	58,123
Total	25	25	25	25	100	234,767
Turnout (%)	*86*	*79*	*74*	*62*	*75*	
Income mobility between 2000 and 2011						
Upwards					24	55,288
Stable					52	121,240
Downwards					25	58,239
Total					100	234,767

Table A6 Turnout in the stable and mobile members of each social class and income quartile pair in the 2015 Finnish parliamentary elections (n: 192,154 for social class; n: 234,767 for income).

Social class mobility 2000–2013				
	Stable higher	**Mobility up**	**Mobility down**	**Stable lower**
Salariat – Intermediate	88	87	86	80
Intermediate – Sales and service	80	79	76	73
Sales and service – Manual	73	66	64	64
Salariat – Sales and service	88	82	80	73
Intermediate – Manual	80	74	72	64
Salariat – Manual	88	79	78	64

Income mobility 2000–2014				
	Stable higher	**Mobility up**	**Mobility down**	**Stable lower**
Highest – Second	88	85	81	80
Second – Third	80	78	75	74
Third – Lowest	74	70	67	57
Highest – Third	88	82	78	74
Second – Lowest	80	75	69	57
Highest – Lowest	88	81	73	57

Figure A7 Estimated turnout probability in the Finnish 2015 parliamentary elections (%) and 95 percent confidence intervals by social class and income quartile pairs and mobility between them (n= 192,154 for social class analysis; n= 234,767 for income analysis). Based on logistic regression adjusted for gender, age, education and own and parental voting in 1999 parliamentary elections.

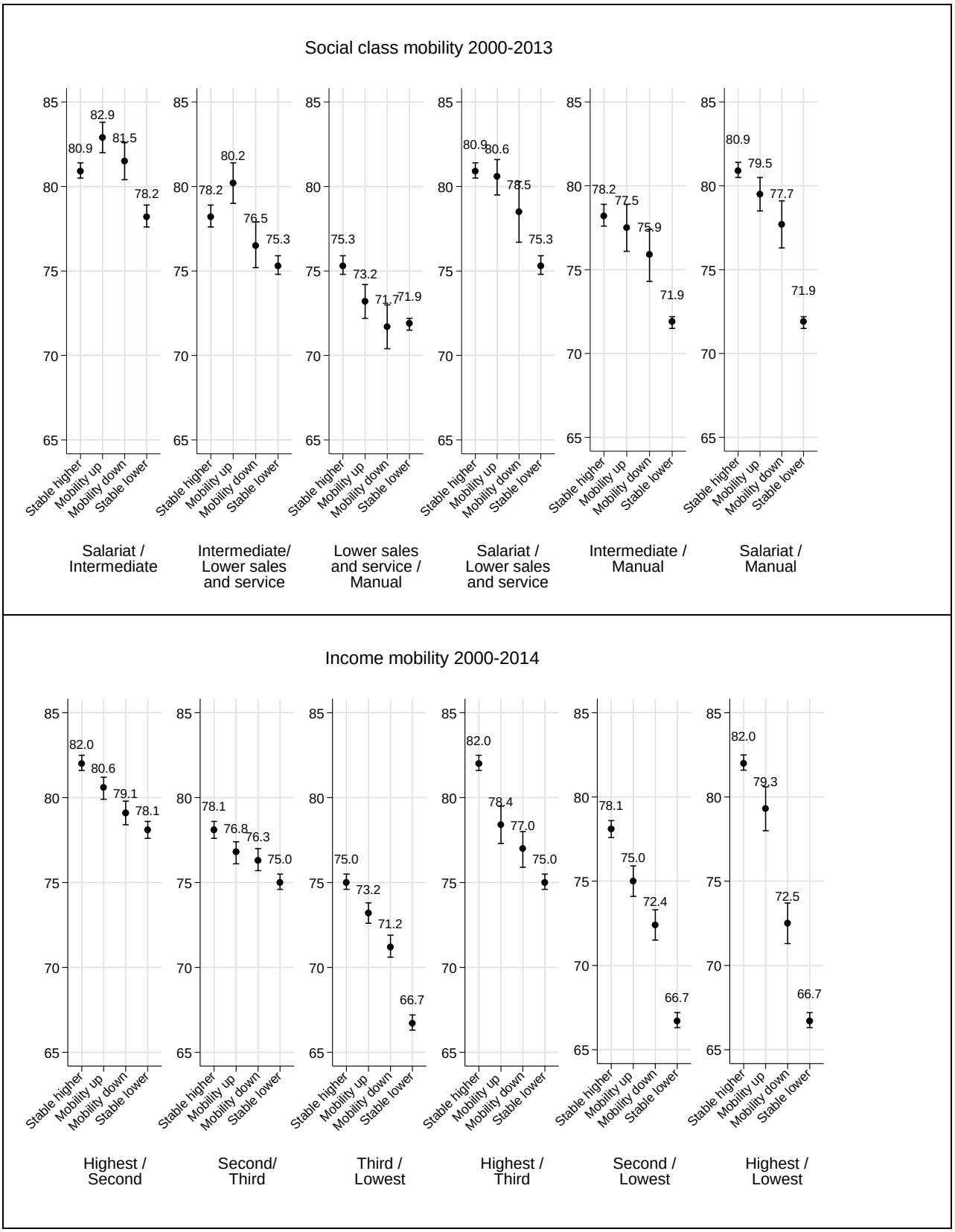


Table A8. Turnout between social classes and income quartiles in the 2015 Finnish parliamentary elections among all and only stable individuals. Column "difference constrained" shows how much the gap is smaller for all individuals compared to stable individuals only in the reference group (salariat or highest income quartile).

Social class in 2013	Stable only		All indivduals		Difference constrained (%)
	%	95% c.i.	%	95% c.i.	
Salariat	80.9	80.5–81.4	80.8	80.4–81.1	ref.
Intermediate	78.2	77.6–78.9	78.9	78.4–79.3	29.6
Lower sales & service	75.3	74.8–75.9	75.3	74.8–75.7	1.7
Manual	71.9	71.5–72.2	72.4	72.1–72.7	6.7

Income quartile in 2014	Stable only		All indivduals		Difference constrained (%)
	%	95% c.i.	%	95% c.i.	
Highest	82.0	81.6–82.5	80.9	80.5–81.3	ref.
Second	78.1	77.6–78.6	77.5	77.2–77.8	12.8
Third	75.0	74.6–75.5	75.2	74.9–75.5	18.6
Lowest	66.7	66.3–67.2	69.0	68.6–69.3	22.2

Post-estimated from logit models adjusted by age, gender, education and own and parental voting in 1999 (as observed values)

Table A9 Distributions of the control variables and turnout in each group in the 2015Finnish parliamentary elections.

	Social class analysis		Income analysis	
	%	Turnout (%)	%	Turnout (%)
Age in 2000				
30–34	30	73	30	72
35–39	32	75	32	75
40–45	38	79	37	78
Gender				
Male	49	75	50	74
Female	51	78	50	77
Education				
Basic	14	59	16	58
Secondary	45	71	46	72
Lower tertiary	30	85	29	85
Upper tertiary	11	93	10	92
Voting in 1999				
No	33	52	34	51
Yes	67	88	66	88
Parental voting in 1999				
Neither voted	15	64	15	62
Only father voted	6	68	6	67
Only mother voted	5	71	5	69
Both voted	70	80	69	79
Both dead	5	74	5	73
Total (N)	192,154	76	234,767	75

Table A10 Turnout in the 2015 Finnish parliamentary elections in social class and income mobility groups (logistic regression, log odds coefficients, standard errors in brackets).

	Social class model	Income model
Social class or income mobility (origin->destination)		
Stable 1 (ref.)	0	0
2->1	0.15 (0.04)	-0.11 (0.03)
3->1	-0.03 (0.04)	-0.27 (0.04)
4->1	-0.11 (0.04)	-0.21 (0.05)
1->2	0.04 (0.04)	-0.22 (0.03)
Stable 2	-0.20 (0.03)	-0.29 (0.02)
3->2	-0.06 (0.05)	-0.38 (0.03)
4->2	-0.25 (0.05)	-0.50 (0.03)
1->3	-0.18 (0.07)	-0.37 (0.04)
2->3	-0.31 (0.05)	-0.41 (0.03)
Stable 3	-0.39 (0.03)	-0.50 (0.02)
4->3	-0.52 (0.04)	-0.61 (0.03)
1->4	-0.24 (0.05)	-0.66 (0.04)
2->4	-0.36 (0.06)	-0.66 (0.03)
3->4	-0.62 (0.04)	-0.73 (0.03)
Stable 4	-0.61 (0.02)	-0.99 (0.02)
Age	0.02 (0.00)	0.02 (0.00)
Gender		
Male (ref.)	0	0
Female	-0.10 (0.01)	0.10 (0.01)
Education		
Basic (ref.)	0	0
Secondary	0.34 (0.02)	0.34 (0.01)
Lower tertiary	0.65 (0.02)	0.80 (0.02)
Higher tertiary	1.13 (0.04)	1.22 (0.03)
Voting in 1999		
No (ref.)	0	0
Yes	1.66 (0.01)	1.65 (0.01)
Parental voting in 1999		
Neither voted (ref.)	0	0
Only father voted	0.10 (0.03)	0.12 (0.02)
Only mother voted	0.15 (0.03)	0.18 (0.03)
Both voted	0.38 (0.02)	0.39 (0.01)
Both dead	0.21 (0.03)	0.22 (0.03)
Constant	-0.85 (0.06)	-1.11 (0.05)
N	192,154	234,767

Table A11 Turnout in the 2015 Finnish parliamentary elections by social class and income and aggregated mobility coefficents (logistic regression, log odds coefficients).

	Class 2000	**Class 2013**	**Income 2000**	**Income 2014**
Social class or income quartile				
1 (ref.)	1	1	1	1
2	-0.19***	-0.18***	-0.24***	-0.29***
3	-0.39***	-0.43***	-0.48***	-0.50***
4	-0.62***	-0.61***	-0.87***	-0.92***
Mobility 2000-2013				
Up	0.31***	-0.02	0.29***	-0.11***
Stable (ref.)	1	1	1	1
Down	-0.14***	0.18***	-0.23***	0.18***
Controls	Yes	Yes	Yes	Yes
N	192,154	192,154	234,767	234,767

*** p<0.001

Table A12 Turnout in the 2015 Finnish parliamentary elections among two age groups and mobility between them (logistic regression, log odds coefficients).

30-38-year-olds in 2000				
Social class or income quartile				
	Class 2000	**Class 2013**	**Income 2000**	**Income 2014**
1 (ref.)	0	0	0	0
2	-0.20***	-0.15***	-0.26***	-0.29***
3	-0.41***	-0.45***	-0.50***	-0.48***
4	-0.63***	-0.62***	-0.82***	-0.88***
Mobility 2000-2011				
Up	0.31***	-0.04	0.29***	-0.09***
Stable (ref.)	0	0	0	0
Down	-0.20***	0.12***	-0.22***	0.17***
Controls	Yes	Yes	Yes	Yes
N	107,578	107,578	132,018	132,018
39-45-year-olds in 2000				
Social class or income quartile				
1 (ref.)	0	0	0	0
2	-0.18***	-0.21***	-0.22***	-0.31***
3	-0.37***	-0.39***	-0.46***	-0.52***
4	-0.59***	-0.58***	-0.93***	-0.97***
Mobility 2000-2011				
Up	0.32***	0.02	0.27***	-0.15***
Stable (ref.)	0	0	0	0
Down	-0.04	0.27***	-0.26***	0.19***
Controls	Yes	Yes	Yes	Yes
N	84,576	84,576	102,749	102,749

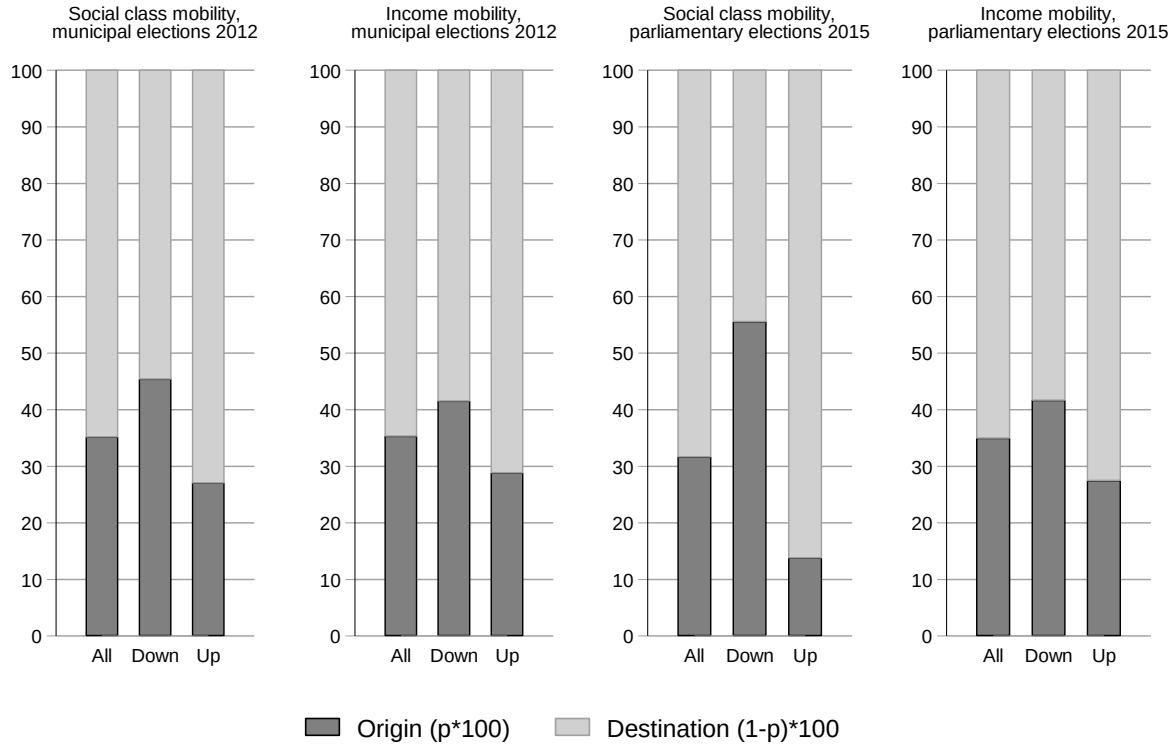
Note: ***p<0.001, **p<0.01, *p<0.05.

Table A13 Parameters of diagonal reference models on the effect of social class and income mobility on turnout of the Finnish municipal elections 2012 and parliamentary elections 2015

	Municipal elections 2012								Parliamentary elections 2015							
	Social class				Income				Social class				Income			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Weight parameters																
Origin (p), all	0.35	(0.04)			0.35	(0.03)			0.32	(0.03)			0.35	(0.02)		
Destination (1-p), all	0.65	(0.04)			0.65	(0.03)			0.68	(0.03)			0.65	(0.02)		
$p+m_{up}$, mobility up			0.27	(0.06)			0.29	(0.05)			0.14	(0.05)			0.27	(0.03)
$1-p+m_{up}$, mobility up			0.73	(0.06)			0.71	(0.05)			0.86	(0.05)			0.73	(0.03)
$p+ m_{down}$, mobility down			0.45	(0.07)			0.41	(0.05)			0.56	(0.05)			0.42	(0.03)
$1-p+ m_{down}$, mobility down			0.55	(0.07)			0.59	(0.05)			0.44	(0.05)			0.58	(0.03)
Social class or income quartile																
1	-1.70	(0.06)	-1.72	(0.06)	-1.92	(0.06)	-1.92	(0.06)	-0.79	(0.06)	-0.83	(0.06)	-1.12	(0.05)	-1.14	(0.05)
2	-1.89	(0.06)	-1.91	(0.06)	-2.07	(0.06)	-2.07	(0.06)	-0.95	(0.06)	-1.02	(0.06)	-1.40	(0.05)	-1.42	(0.05)
3	-1.98	(0.06)	-1.99	(0.06)	-2.20	(0.06)	-2.20	(0.06)	-1.23	(0.06)	-1.29	(0.06)	-1.59	(0.05)	-1.61	(0.05)
4	-2.20	(0.06)	-2.21	(0.06)	-2.51	(0.06)	-2.51	(0.06)	-1.44	(0.06)	-1.47	(0.06)	-2.07	(0.05)	-2.09	(0.05)
Covariates																
Age	0.03	(0.00)	0.03	(0.00)	0.03	(0.00)	0.03	(0.00)	0.02	(0.00)	0.02	(0.00)	0.02	(0.00)	0.02	(0.00)
Woman	-0.07	(0.01)	-0.07	(0.01)	0.06	(0.01)	0.06	(0.01)	-0.10	(0.01)	-0.09	(0.01)	0.10	(0.01)	0.10	(0.01)
Secondary education	0.27	(0.02)	0.27	(0.02)	0.26	(0.02)	0.26	(0.02)	0.34	(0.02)	0.34	(0.02)	0.34	(0.01)	0.34	(0.01)
Lower tertiary education	0.58	(0.02)	0.58	(0.02)	0.69	(0.02)	0.69	(0.02)	0.65	(0.02)	0.65	(0.02)	0.80	(0.02)	0.80	(0.02)
Higher tertiary education	0.99	(0.03)	0.99	(0.03)	1.10	(0.03)	1.10	(0.03)	1.11	(0.03)	1.13	(0.03)	1.23	(0.03)	1.23	(0.03)
Voting in 1999	1.60	(0.01)	1.60	(0.01)	1.59	(0.01)	1.59	(0.01)	1.66	(0.01)	1.66	(0.01)	1.65	(0.01)	1.65	(0.01)
Only father voted	0.05	(0.04)	0.05	(0.04)	0.05	(0.04)	0.05	(0.04)	0.11	(0.03)	0.11	(0.03)	0.12	(0.02)	0.12	(0.02)
Only mother voted	0.21	(0.05)	0.20	(0.05)	0.18	(0.04)	0.18	(0.04)	0.15	(0.03)	0.15	(0.03)	0.18	(0.03)	0.18	(0.03)
Both voted	0.39	(0.02)	0.39	(0.02)	0.40	(0.02)	0.39	(0.02)	0.38	(0.02)	0.38	(0.02)	0.39	(0.01)	0.39	(0.01)
Both dead	0.22	(0.03)	0.22	(0.03)	0.22	(0.03)	0.22	(0.03)	0.21	(0.03)	0.21	(0.03)	0.21	(0.03)	0.21	(0.03)
AIC	157,066		157,064		164,398		164,397		174,880		174,852		215,762		215,752	
N	143,322		143,322		150,709		150,709		192,154		192,154		234,767		234,767	

Reference categories: man, basic education, did not vote in 1999, neither parent voted in 1999. Models 2 show the weight parameters with separate dummies for upward and downward mobility.

Figure A14 Relative weights of the socioeconomic position of origin and destination (%), based on the diagonal reference models of Table A9



Notes

[1] Compared to other stable elements in Table 1, education is admittedly less permanent since an individual's educational qualifications can change even after early adulthood. In practice, however, the proportion of the population whose educational qualifications increase after reaching their thirties is small. (In the follow-up of our study, the proportion of those was 7 %). In addition, the direction of the causality is clear since education influences adulthood social class (which, in turn, influences income), whereas changes in social class position do not affect achieved level of education.

[2] The ESeC matrices were accessed on the resource website of the European Socio-economic Classification (https://www.iser.essex.ac.uk/archives/esec).

[3] Most of the differences between the sample sizes of the income and social class included in the analyses is related to this exclusion, which was not made for income models.

[4] Unfortunately, genetic influences cannot be measured directly with the data at our disposal.

[5] Of course, since parental turnout is situated very early in the causal chain of the factors included in our models, a large share of its effect is likely to be indirect, namely mediated via other factors in the models.

[6] Also in the descriptive Table 2, turnout gap is almost identical for income quartiles and social classes in 2011.

[7] The greater weight of the class of destination is largely accountable by inclusion of covariates (except for income in 2015). This is reasonable since they are determined earlier in the life course and thus more proximate to the measurement of the class of origin. Models without covariates would give origin weights (p) of 0.48 for social class and 0.42 for income in 2012 elections; and 0.46 for social class and 0.36 for income in 2015 elections.