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Research Article

Voter Turnout and Political Equality: Testing the 'Law of Dispersion' in a Swedish Natural Experiment

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According to the 'law of dispersion', the level of inequality in political participation is higher when voter turnout is low. We empirically test this hypothesis by evaluating levels of voter turnout in the 2010 Swedish election to the Västra Götaland county council and in the 2011 re-election for the same county council. The re-election voter turnout was reduced by almost half, from 80.6 per cent to 44.1 per cent. Our results support the law of dispersion: the level of inequality in participation substantially increased between young and old, rich and poor, low and high educated and politically interested and uninterested.

Keywords: voter turnout; voter participation; political equality; law of dispersion; re-elections

1. Introduction

The higher the level of voter turnout, the higher the level of equality in political participation.[1] This is the so-called 'law of dispersion' formulated by Herbert Tingsten in his seminal work *Political Behavior* (Tingsten, 1937; see also Rosenstone and Hansen, 1993). The Swedish county council elections in 2010 and the subsequent re-election of the Västra Götaland county council[2] in 2011 provide a natural experiment well suited for testing the law of dispersion. In September 2010, the county council elections were held simultaneously with the national and local elections, resulting in a relatively high turnout of 80.6 per cent. However, the Swedish Election Review Board discovered irregularities involving both uncounted votes and the counting of votes that should not have been counted. It therefore decided that the Västra Götaland county council election should be repeated in May 2011. In the re-election, voter turnout was reduced by almost half, to only 44.1 per cent.[3] In this article we analyse whether Tingsten's law of dispersion is supported in this case; that is, was the lower level of turnout in the re-election associated with a higher level of political inequality?

This article brings an important contribution to the debate by exploiting a rare natural experiment. To our knowledge, this is the first (quasi-)experimental test of the law of dispersion, and hence we are able to bring unique evidence to the debate. Our results clearly show that Tingsten's 'law' holds; as turnout decreases, inequality increases.

The article will proceed as follows. In section 2, we discuss political equality and its consequences for political participation. We also present previous research on political equality and political participation as well as research on the law of dispersion. In section 3, we discuss the electoral context of the election and re-election in Västra Götaland, Sweden. We present our data in section 4, followed by the empirical analyses and interpretations of our results. The article ends with a concluding discussion.

2. Political equality and political participation

According to Sidney Verba (2003), political equality can have at least three different – and connected – meanings: the equal right to participate; the equal capacity and opportunity to participate; and equal voice. The first meaning – *the equal right to participate* – is the foundation of representative democracy. Voter turnout is often regarded as the most equal form of participation. In accordance with the idea of 'one man – one vote', all citizens enact equal amounts of influence in the political process (Lijphart, 1997; Verba, 2003).

The *equal capacity and opportunity to participate* refers to citizens' resources, skills, competences and access to information, representatives and government agencies. As a consequence, capacity and opportunity are closely related to social equality (Verba, 2003). Even though not all eligible voters vote, the level of equality tends to be lower for other forms of participation, such as participation in political parties, since such activities require more resources, skills and time (Schlozman, Verba and Brady, 2012; Verba, Schlozman and Brady, 1995).

The third meaning of political equality is *equal voice*, that is, the *use* of participation. If citizens to varying degrees use their rights and capacities, implying unequal levels of participation across citizens or groups of citizens, political influence will be biased towards those who participate. In the longer run, this could bias policy output (Verba, 2003). Schlozman, Verba and Brady (2012, p. 139) also argue that political equality can still be achieved in the event of an unequally distributed turnout if the interests and preferences, defined not only as election outcomes but also as policy attitudes, of the non-voters resemble the interests and preferences of the voters. However, even if the interests and preferences do not differ, there is still the risk of an unequal outcome since it is difficult for elected politicians to give a response to unheard preferences and interests.

Thus, the democratic capacity of electoral democracy largely lies in the potentially high levels of equality in political participation (Lijphart, 1997; Verba, 2003). Voter turnout is often considered the most important indicator of democratic legitimacy. One reason for this is that the true will of the people can only be achieved if citizens express their opinions in elections. Of course, at high levels of voter turnout, no large group in society can have a very low level of participation, and low voter turnout might not be a problem if voter turnout decreases proportionally across all groups. If turnout is low, but equally low among all groups, the will of the people can still be expressed without bias. However, if the law of dispersion is correct, political inequality will increase as voter turnout decreases. As a consequence, the opinions aggregated in the elections will be a biased representation of the will of the people.

Socio-economic explanations have dominated in research on the causes of political participation (e.g., Verba and Nie, 1972). However, according to the Civic Voluntarism Model (CVM), political participation is influenced not only by resources but also by motivation and mobilisation (Verba, Schlozman and Brady, 1995). In other words, three factors are crucial to

explaining why people participate in politics: whether they can, whether they want to and whether they were asked to do so. In a similar vein, research on voter turnout usually focuses on individual-level, contextual and institutional factors to explain variations in turnout (Franklin, 2004; Holmberg and Oscarsson, 2004). Individual-level factors refer to citizens' resources, skills and cognitive capacity. Contextual factors refer to factors such as the competitiveness of elections, election campaigns and neighbourhood effects. Cross-country comparative studies focus largely on institutional factors related to the electoral system (Franklin, 2004).

Individual-level factors were the main focus for Tingsten (1937) when he formulated the law of dispersion. Drawing from comparative data on voter turnout among age groups, social classes and gender, Tingsten concluded that differences in turnout levels across these groups decreased as turnout increased:

> All the facts gathered here indicate the existence of a rule which may be named the law of dispersion; according to this rule, the dispersion (the differences) in regard to participation in an election or within a certain group, is smaller the higher the general participation is (Tingsten, 1937, p. 230).

Conversely, differences in turnout levels between these groups increase as voter turnout decreases.

The relevance of Tingsten's law of dispersion in contemporary political science is clearly marked in Arend Lijphart's seminal 1997 article in which he stated: 'The democratic goal should not be just universal *suffrage* but also universal or near-universal *turnout* – in line with Tingsten's (1937, p. 230) "law of dispersion" ' (Lijphart, 1997, p. 2, emphasis in original). From his research overview, Lijphart argued that class biases in turnout are higher when turnout is lower and that this pattern was especially prominent in the US. Yet, that turnout is higher among the advantaged than the disadvantaged and that these differences persist over time is, as discussed above, far from new. What Tingsten proposed was that the bias gets *worse* as turnout decreases, which implies that the relationship between class and turnout should get stronger as turnout decreases, a statement Lijphart did not properly investigate (see Sinnott and Achen, 2008). Thus, as argued by Richard Sinnott and Christopher Achen (2008), Tingsten's law is not about the absolute change, but the relative change. To illustrate, they used the following example. Let us say that the proportion of middle-class voters who voted in one election was 90 per cent and that the turnout in this group drops by 12 percentage points in the next election. Then the relative change in turnout is 12/90 = 13.3 per cent. Between the same two elections, the turnout among working-class voters drops by 10 percentage points, from 50 per cent to 40 per cent. This equals a 10/50 = 20 per cent turnout decrease. Even though the decrease in absolute numbers is larger among middle-class voters, in relative numbers the turnout decreases more among the working class, leading to an increased gap in turnout between working-class voters and middle-class voters, and hence to a more biased and unequal turnout (Sinnott and Achen, 2008).

Sinnott and Achen (2008) only found scattered support for the hypothesis that class biases get worse as turnout drops when they reinvestigated Lijphart's claim of Tingsten's law. One important reason why they found no (in the US) or modest (in Europe) evidence of Tingsten's law with regard to class bias is that other mechanisms besides class are more important for who votes and who does not. However, as pointed out by Zoltan Hajnal and Jessica Trounstine (2005), the reason why many conclude that the inequalities in turnout might not matter so much is that most researchers focus on national elections, which are often associated with

relatively high turnout. Previous research from the US shows both that the preferences among voters and non-voters, respectively, do not differ much (see, for example, Schlozman, Verba and Brady, 2012; Verba, Schlozman and Brady, 1995)[4] and that changes in turnout often only marginally, if at all, affect the election outcome (see, for example, Highton and Wolfinger, 2001). If the focus is shifted to local elections with low turnout, evidence can be found that inequalities in turnout with regard to race were larger and that the election outcome will be different with higher and more equal turnout (Hajnal, 2010; Hajnal and Trounstine, 2005).

In sum, although there have been few direct empirical tests of Tingsten's law, its relevance is still marked by scholars interested in turnout and inequality (Hajnal, 2010; Hajnal and Trounstine, 2005), turnout and the election outcome (Finseraas and Vernby, 2011; Hajnal, 2010; Hajnal and Trounstine, 2005) and compulsory voting (Fowler, 2011; Lijphart, 1997).

Comparing the Swedish 2010 Västra Götaland county council election and the 2011 re-election that followed represents a unique opportunity for an empirical test of Tingsten's law. Sweden has a long tradition of high voter turnout. Since 1948, the average voter turnout in national elections is 85.4 per cent and the figure for county council elections is 83.2 per cent (Severin and Berg, 2012). From 1946 to 2010, the average turnout in county council elections has never decreased below 70 per cent and has been 80 per cent or higher in 13 out of 19 election years. During the same period, the turnout in national elections has been over 80 per cent in 16 out of 19 elections and has since 1960 never dropped below 80 per cent.[5] Thus, high turnout is not an isolated phenomenon – it persists over time and appears in elections at different levels of democracy. In general, a proportional electoral system, Sunday voting, good opportunities for early voting, automatic registration and national, regional and local elections being held at the same time (since 1970) are the institutional keys to this high turnout. In fact, Sweden is one of the few European countries with regional and local elections held on the same day as the national election, which is one explanation for the – from a European perspective – unusually small difference in turnout between these two elections (Dandoy and Schackel, forthcoming). Yet despite high levels of voter turnout, all groups in society do not participate equally; levels of voter turnout are lower among young people, immigrants, the less educated and the politically uninterested (Holmberg and Oscarsson, 2004; for similar results for Germany, see Franklin, 2004).

3. The 2010 Swedish election and the 2011 re-election

The Swedish electoral system is based on proportional representation. The seats are distributed according to a modified version of the Sainte-Laguë method, which implies some adjustments to compensate for imbalances in the distribution of seats. A political party must gain at least 3 per cent of the valid votes in order to reach representation in a county council. Citizens of EU countries, Iceland and Norway with residency in Sweden, as well as other foreign citizens with at least three years of Swedish residency, are eligible to vote in elections to the county councils (Swedish Election Authority, 2012). The county council of Västra Götaland is the second largest parliament in Sweden with 149 seats, only outnumbered by the Swedish Riksdag and its 349 seats (Swedish Election Authority, 2012).

After the 2010 county council election, the Swedish Election Review Board received a record high number of complaints about irregularities concerning Västra Götaland county council election. After a review, it was found that in total 174 votes were faulty votes, for example,

invalid votes that were counted and valid votes that were not counted. Most notable was that 16 votes for the Centre Party were falsely deemed faulty, which led to the party receiving one less seat in the council. Irregularities and faulty votes were present in all five constituencies in Västra Götaland county. On these grounds, the Swedish Election Review Board decided that the election had to be repeated since the flaws most likely affected the outcome of the election. For the re-election, a new electoral register was established, and as a consequence the electorate differed slightly between the two elections; voters who had moved from the county since the 2010 election *were not* eligible to vote in the re-election and citizens who had moved to the county or turned 18 years old by the re-election day *were* eligible to vote. However, this only led to very minor changes in the electorate.[6] In addition, the free nomination right for parties also meant that a new party entered the competition in the re-election compared to the original election. Thus, in a strict manner, the re-election was a new election.[7]

Even though re-elections at the national, regional and local levels have occurred during the Swedish history of elections, re-elections in the past are few and have only affected a single municipality or a very limited number of constituencies (Teorell, 2012). From a Nordic perspective, re-elections are also extremely rare (Öhrvall, 2012b). What makes the re-election to the Västra Götaland city council remarkable in a historical context is that it was held in all of its five constituencies and affected 17 per cent of all eligible voters in the 2010 county council elections in Sweden.

In general, regional elections are defined as second-order elections due to characteristics such as lower turnout, vote losses for government parties and vote wins for small opposition parties compared to national elections (Dandoy and Schackel, forthcoming; Reif and Schmitt, 1980). However, the joint election day in Sweden cushions part of the second-order effects typically associated with regional elections. In 2011, when the re-election was held independently, the characteristics of being a second-order election became much stronger (see also Berg and Oscarsson, forthcoming). In 2010, the election campaigns were intense, the media attention was massive and many voters found the election exciting and important. In contrast, in the 2011 re-election the media attention was very marginal, the election campaigns were less intense and fewer people cared about the outcome (Oscarsson and Severin, 2012). Although the 2010 county council election and the 2011 re-election are institutionally identical, the contextual circumstances differed substantially.

4. Data

We compared the voter turnout among different groups of voters in the 2010 Västra Götaland county council election and the 2011 re-election using two data sources: surveys conducted by the Society Opinion and Media (SOM) Institute at the University of Gothenburg[8] and the Electoral Participation Survey carried out by Statistics Sweden. The West SOM survey of 2010 was a postal survey sent out to a random sample of 5,503 adults in Västra Götaland county with a response rate of 59 per cent. The re-election SOM survey of 2011 was sent out to 2,764 adults and reached a response rate of 61 per cent. Since the SOM surveys only included self-reported voting, the levels of voter turnout are overestimated in the data, which could affect the substantive interpretations of the results.[9] An additional source of bias is the roughly 40 per cent non-response rate. To ensure that our results were robust and valid, we also analysed the Electoral Participation Survey carried out by Statistics Sweden. This survey is based on administrative data from register files and is therefore not vulnerable to the

problems related to missing data that often plague surveys. The 2010 study includes about 110,000 individuals, and 18,000 of them were eligible to vote in the Västra Götaland county council election.[10] The data set included validated voting from the electoral rolls in both the 2010 election and the 2011 re-election.

In our analysis, we used a number of variables that previous research has shown to affect voter turnout: age, gender, income, civil status, education, citizenship, country of birth and political interest. With the exception of political interest and country of birth, all of these variables are included in both the data from the SOM Institute and the data from Statistics Sweden. Since the dependent variable is dichotomous, we used logistic regression to analyse the data. Since the logistic regression coefficients are not substantively interpretable, we have presented our results not only in tables but also graphically as predicted probabilities of voting within relevant groups.

5. Results

Results from the logistic regression models are presented in Table 1 (SOM) and Table 2 (Statistics Sweden). Table 1, model 1 and model 3 estimate the effect of socio-economic factors on turnout in 2010 and 2011, respectively. In models 2 and 4, we add 'political interest'. In both elections, the results indicate significant effects in the expected direction when it comes to gender, age, education, income, civil status, citizenship and political interest. In other

Table 1: Effects on voter turnout in the 2010 election and 2011 re-election, logistic regression (SOM data)

	Model 1 2010	Model 2 2010	Model 3 2011	Model 4 2011
Gender (0 = woman, 1 = man)	–0.164 (0.170)	–0.108 (0.173)	–0.231** (0.113)	–0.210* (0.117)
Age	0.019*** (0.005)	0.010* (0.005)	0.034*** (0.003)	0.027*** (0.004)
Household income	0.096** (0.045)	0.075 (0.046)	0.054* (0.029)	0.069** (0.030)
Civil status (0 = unmarried, 1 = married)	0.616*** (0.194)	0.650*** (0.198)	0.203 (0.161)	0.186 (0.166)
Years of education	0.111*** (0.030)	0.093*** (0.031)	0.114*** (0.021)	0.097*** (0.021)
Citizenship (0 = other, 1 = Swedish)	1.979*** (0.379)	2.255*** (0.409)	0.715** (0.297)	0.753** (0.302)
Political interest (1 = low, 4 = high)		0.970*** (0.123)		0.669*** (0.078)
Constant	–2.314*** (0.628)	–4.105*** (0.696)	–3.818*** (0.493)	–5.002*** (0.528)
N	2505	2505	1458	1458
pseudo R^2	0.074	0.131	0.068	0.107

Source: West SOM 2010 and re-election SOM 2011.
*Notes: Standard errors in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.*

Table 2: Effects on voter turnout in the 2010 election and the 2011 re-election, logistic regression (register-based data, Statistics Sweden)

	Model 1 2010	Model 2 2010	Model 3 2011	Model 4 2011
Gender (0 = woman, 1 = man)	–0.168*** (0.056)	–0.180*** (0.057)	–0.135*** (0.044)	–0.138*** (0.044)
Age	0.009*** (0.002)	0.008*** (0.002)	0.024*** (0.001)	0.023*** (0.001)
Household income	0.171*** (0.013)	0.153*** (0.013)	0.067*** (0.008)	0.057*** (0.008)
Civil status (0 = unmarried, 1 = married)	0.395*** (0.073)	0.500*** (0.073)	0.201*** (0.051)	0.247*** (0.053)
Years of education	0.166*** (0.012)	0.163*** (0.012)	0.149*** (0.009)	0.148*** (0.010)
Citizenship (0 = other, 1 = Swedish)	1.995*** (0.069)	1.419*** (0.090)	0.921*** (0.068)	0.464*** (0.088)
Country of birth (0 = other, 1 = Sweden)		0.786*** (0.080)		0.585*** (0.073)
Constant	–3.382*** (0.193)	–3.364*** (0.192)	–4.300*** (0.158)	–4.316*** (0.159)
N	16 761	16 761	16 999	16 999
F-values	239.05	215.08	144.12	129.95

Source: Statistics Sweden.
*Notes: Standard errors in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01.*

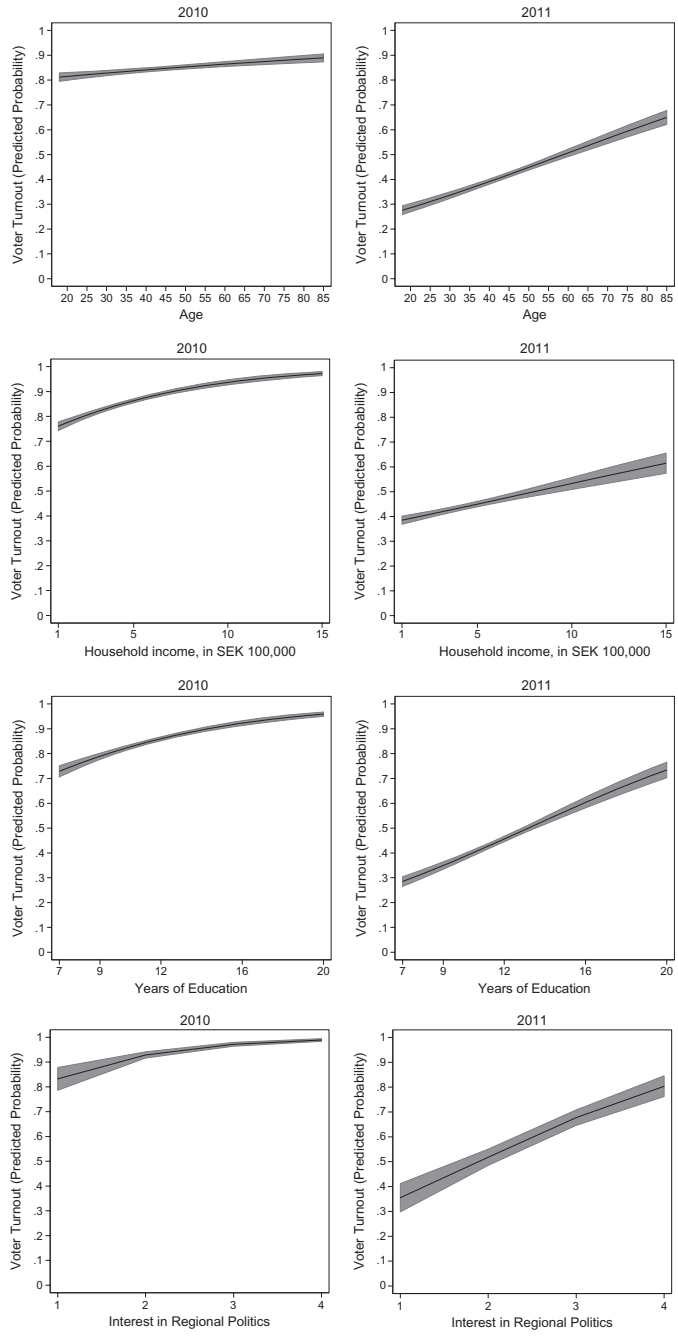
words, voter turnout is higher among females, older people, high-income earners, married people, more highly educated individuals, Swedish citizens and the politically interested.

Table 2 presents results from equivalent models estimated using data from Statistics Sweden. Models 1 and 3 include the same variables as the corresponding models in Table 1. In models 2 and 4, we add a variable representing 'country of birth', a variable that is not included in the SOM surveys. The results drawing on the register-based data are strikingly similar to what we saw in the previous models. In both elections, there are significant effects in the expected directions for age, education, income, civil status, citizenship and foreign born.

In order to analyse whether political inequality increased in the re-election compared to the regular election, Figure 1 illustrates the predicted probabilities of voting for persons of different ages and with different levels of income, years of education and political interest, that is, all our variables that are not coded as dummies.[11] Since the results from the SOM data and Statistics Sweden data are strikingly similar, we use the register-based data to estimate the predicted levels in the graphs, with the exception of the political interest graphs, which draw on the SOM data.

We can begin by looking at the impact of age. In both the election and the re-election, older people had a higher voter turnout than younger people, yet the difference was larger in the re-election. The model-based estimations show that the voter turnout was about 6 percentage points higher among 70-year-olds than among 18-year-olds in 2010.[12] The corresponding

Figure 1: Predicted probability of voting for different groups in the 2010 county council election and the 2011 county council re-election in Västra Götaland county



Source: Statistics Sweden and the SOM Institute.

difference in the 2011 re-election was 28 percentage points. Expressed in percentages, the decrease in turnout was 35 per cent among 70-year-olds and 66 per cent among 18-year-olds. Hence, political inequality related to age increased dramatically.

Next we look at differences in turnout related to household income. Again, the difference in turnout between poor and rich persons increased in the re-election. The difference in voter turnout between the poorest and richest was about 15 percentage points in 2010 and about 20 percentage points in 2011. The decrease in turnout between the two elections was, expressed as a percentage, 49 per cent among the poorest and 37 per cent among the richest.

We continue by analysing the inequality related to education, which is illustrated in the fifth and sixth sections of Figure 1. The difference between those with seven years of schooling and those with 16 years of schooling was about 19 percentage points in the 2010 election. In 2011, the corresponding difference had increased to about 32 percentage points. Hence, the level of political inequality related to education increased as well. The higher decrease in turnout among voters with lower levels of education than among voters with higher levels of education is also clearly manifested if we look at the percentage change. The turnout decreased by 61 per cent among voters with seven years of schooling and by 35 per cent among voters with 16 years of schooling.

Finally, we can look at political interest. A significant difference between those with low and high interest is evident already in the 2010 election, yet the difference is relatively small. Both those with high and low political interest voted to a relatively high degree in 2010. However, the difference between those with low and high interest was much larger in the re-election. The difference in predicted probability of voting between the low and high interested was about 35 percentage points in the 2011 re-election. The predicted probability of voting decreased from 83 per cent to 36 per cent among persons with low interest, which is a decrease of 47 percentage points or 57 per cent. For voters with high political interest, the predicted probability of voting decreased from 99 per cent to 80 per cent, which equals a decrease of 19 percentage points or 19 per cent. From our results we can thus conclude that those who abstained from voting in the 2011 re-election were mainly persons with low political interest. In the regular election, those with low interest voted to a relatively large extent.

Disregarding whether the predicted probabilities of voting in the two elections are compared within or between groups, or calculated as percentage points or per cent, our analysis shows consistent evidence that the voting gap increased between voters with low socio-economic status and low political interest versus voters with high socio-economic status or high political interest. This is because turnout decreased more, both in absolute and relative terms, in the former group than in the latter.

6. Conclusion

In this article, we have empirically tested the so-called law of dispersion, that is, whether the level of political inequality increases as the level of voter turnout decreases. This has been carried out by studying the levels of voter turnout in the 2010 Swedish election to the Västra Götaland county council and in the 2011 re-election to the same county council. The analysis reveals differences in voting rates according to socio-demographic characteristics that are in line with previous research (e.g., Franklin, 2004; Wolfinger and Rosenstone, 1980). Furthermore, as the general turnout decreased in the re-election, the level of inequality in participation

increased between all groups compared in this study. This result lends support to Tingsten's law of dispersion. From a political equality perspective, it can be considered worrisome that the relatively modest differences related to age, income, education and political interest in the 2010 regular election grew much larger in the 2011 re-election.

The Swedish re-election in 2011 provides an excellent setting for testing the effect of a substantially lower turnout on political equality. Still, there are some contextual differences between the regular election and the subsequent re-election, and of course it only constitutes a single case. Hence, further research in similar settings would be beneficial. Studies examining the consequences of increasing political inequality in participation, including whether and how it affects the perceived legitimacy of the institutions and whether the election outcome would have been different had everybody voted, are also needed.

Nevertheless, our results have important policy implications; if political equality in participation is an aim, having second-order elections, such as the Swedish regional elections, on the same day as a national election is an effective way to increase voter turnout. As we can see, the level of political equality was much higher when the national election helped increase voter turnout in the regional election in 2010 than when the re-election was held separately in 2011.

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Notes

1 Part of the work presented in this article has previously occurred as a book chapter in an in-house publication in Swedish (Persson, Solevid and Öhrvall, 2012). Although the main argument and the empirical analyses are the same in the two versions, in the current version we have considerably developed and strengthened the theoretical, contextual and empirical arguments. The developments concern a theoretical discussion of political equality, a literature review of political science research using the law of dispersion, information about the electoral setting of Sweden in general and regional elections in particular, inclusion of relative comparisons in the empirical analyses and a discussion about generalisability of our conclusions.

2 Västra Götaland county is located in western Sweden. Population-wise, the county is the second largest in the country (after the capital region of Stockholm), with a population of approximately 1.6 million. The largest city is Gothenburg, with a population of over 550,000 (900,000 in the greater Gothenburg area).

3 It should be noted that, despite low turnout, the outcome of the re-election highly resembled the original election. The Social Democrats gained five seats and the regional Health Care Party lost its representation (all seven seats). The other seven parties that gained representation after the original election (the Left Party, the Green Party, the Centre Party, the Liberals, the Moderates, the Christian Democrats and the Sweden Democrats) remained either unaffected or gained/lost two seats or less after the re-election.

4 It should however be noted that there are big differences between inactive citizens and active citizens when investigating other forms of participation (Schlozman, Verba and Brady, 2012, ch. 5).

5 We use the term average turnout since the county council elections are elections to 21 separate councils. The main reason for lower turnout in municipal and county council elections than in national elections is that foreign citizens with three years of residence in Sweden are eligible to vote in municipal and county council elections but not in national elections (Öhrvall, 2012b).

6 The number of eligible voters increased by 6,000 between the two elections. Twenty-seven thousand voters were removed from the register (moved or passed away) and 33,000 voters were added (moved to the region or turned 18 years). Thus, these are very limited changes in a voting population of more than 1.2 million.

7 One could argue that two elections within eight months might cause voter fatigue. However, previous experience indicates that this is not a concern. In 1994, the general election in September was followed by a national referendum in November, and the voter turnout was even higher in the referendum.

8 http://www.som.gu.se

9 In SOM 2010, the reported turnout is 93 per cent compared to the official turnout of 81 per cent. In the re-election SOM, the reported turnout is 43 per cent compared to the official turnout of 44 per cent.

10 The Electoral Participation Survey uses a stratified sample in which sample objects are drawn with different probabilities. The stratification of the sample and the inclusion probabilities have been taken into account in the analyses. For additional information, see Öhrvall (2012a).

11 One objection to our strategy of measuring inequality is that it could be sensitive to the level of participation. Instead of focusing on the probability of voting among different groups and the absolute and relative comparisons, an alternative strategy is to analyse the share of the different groups who actually voted (e.g., Teorell, Sum and Tobiasen, 2007). However, in this case such a strategy does not lead to different conclusions. Regardless of whether we analyse the probability of voting in different groups or the socio-demographic composition of those who actually voted, the conclusion is that political inequality increased in the 2011 re-election compared to the 2010 election.

12 Note that these are model-based estimates of turnout under control for a large number of variables. For descriptive statistics of turnout in the re-election, see Öhrvall (2012a).

Appendix A: questions and variable constructions in the West SOM and re-election SOM surveys

Gender: 'Are you female or male?' The answers have been complemented with register information.

Age: 'What year were you born?' Year of birth has been recoded into age. Answers have been complemented with register information.

Household income: 'Please mark the box that corresponds to the approximate annual income of all members in your household (including pensions and study allowances)'. Category 1 corresponds to less than SEK 100,000 (approx. €10,000) and 9 corresponds to more than SEK 800,000 (approx. €80,000).

Civil status: 'What is your civil status?' The response options are single, common law (living together), married/registered partnership and widow/widower. Single and widow/widower are coded as single (0), and common law and married/registered partnership are coded as married (1).

Education: 'What is your level of education?' Eight different options are included in the question, but are here converted to years of education (0–16). Not complete compulsory school (0 years) to university degree or PhD (16 years).

Citizenship: 'Are you a Swedish citizen, a citizen of another country, or both a Swedish citizen and a citizen of another country?' In the analyses, Swedish citizen and 'both a Swedish citizen and a citizen of another country' are coded as Swedish citizen (1).

Political interest: 'How interested are you in political issues regarding the Västra Götaland region?' The response options are very interested (1), somewhat interested (2), not that interested (3) and not at all interested (4). In the analyses, the response scales have been reversed (high values = high interest).

Appendix B: Variable constructions in Statistics Sweden's Electoral Participation Survey

Information on voting is gathered from electoral rolls. Gender, age, country of birth, citizenship and civil status are retrieved from Statistics Sweden's Population Register (information on citizenship is validated against registers provided by the Swedish Election Authority). Age refers to the age at the end of 2010. Country of birth and citizenship are coded 1 for Sweden and 0 otherwise. Regarding civil status, married and registered partners are coded 1 and all others are coded 0 (including cohabitees and widows/widowers). Information on income is obtained from Statistics Sweden's Income and Taxation Register (2009) and refers to the household's total income from employment and business (income from capital is not included). The composition of household is defined based on register information and with the use of assumptions. Information on achieved educational attainment is retrieved from Statistics Sweden's Register of Education (2009).

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