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Core and Peripheral Voters: Predictors of Turnout across Three Types of Elections

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Abstract

Citizens who abstain from voting in consecutive elections and inequality in turnout in democratic elections constitute a challenge to the legitimacy of democracy. Applying the law of dispersion, which stipulates higher levels of turnout and higher levels of equality in turnout are positively related, we study turnout patterns across different types of elections in Denmark, a high-turnout European context. Across three different elections with turnout rates from 56.3 to 85.9 percent, we use a rich, nationwide panel dataset of 2.1 million citizens with validated turnout and high-quality sociodemographic variables. Nine percent of the citizens are abstainers in the three consecutive elections, and these are disproportionately male, of non-Western ethnic background, with little education, and with low income. The law of dispersion finds support as inequalities in turnout increase when turnout decreases and vice versa. Furthermore, municipalities with lower turnout have higher inequalities in participation than high-turnout municipalities in local elections.

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Bio

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When the projected turnout for the European Parliament election in 2014 was announced to be 43.1 percent, a small increase from 43 percent in 2009, the liberal leader Guy Verhofstadt said, *"The European Parliament will be more representative than the previous one"* (Euractiv 2014). While the final vote count showed that turnout was, in fact, 42.6 percent, a small decline from 2009, Mr. Verhofstadt's focus on representativeness is in line with concerns expressed by many European leaders. Not only political leaders have this focus. Indeed, studying inequalities in political participation, and particularly voter turnout, remains a central topic in political science. Participatory equality is often mentioned as a core democratic ideal (Lijphart 1997; Wolfinger & Rosenstone 1980). If some groups disproportionately abstain from voting, it may have important consequences for democracy. These groups will have less influence on who is elected and become underrepresented by legislators (Martin 2003; Griffin & Newman 2005; Leighley & Nagler 2013) and, as a consequence, they might identify less with their representatives and mistrust them more (Mansbridge 1999).

Aggregate turnout varies substantially across different types of elections. European countries experience higher turnout rates in national elections than in local and European elections (Blais 2000: 37; Morlan 1984; Reif & Schmitt 1980; IDEA 2016). Strong variation across elections is not unique to Europe. In the US, turnout surges for presidential elections and declines when midterm elections take place (Campbell 1987; McDonald 2016). While turnout studies often examine differences between voters and abstainers in individual elections (e.g., Sigelman et al. 1985: 749), only little empirical attention has been given to the variation in the predictors of voting across elections (e.g., Persson et al. 2013; Nawara 2016). Do the same sociodemographic factors explain the variation in turnout when turnout is 43 percent as when turnout is 65 percent (i.e., the national election turnout average among EU-member states in 2014, IDEA 2016) and with the same strength? We use validated turnout and register data for more than 2 million citizens who were all

eligible to vote in three Danish elections at, respectively, the local, European, and national levels from 2013 to 2015. In the three elections, turnout ranged from 56.3 to 85.9 percent. The turnout data from the elections are merged with administrative data at the individual level, which contains hundreds of highly reliable sociodemographic variables. This allows us to analyze the predictors of cumulative voting, the total number of votes cast in a number of consecutive elections, in a high-turnout context and the potential differential drop-off of voters across different types of elections. As we rely on a large administrative, individual-level dataset with validated turnout and reliable covariates in different types of elections, we overcome well-known problems of self-reported voting and small survey samples which have characterized much of the previous literature (Smets & Van Ham 2013; Karp & Brockington 2005; Bernstein et al. 2001; Dahlgaard et al. 2018).

Studies that examine multiple elections often look at cumulative turnout based on citizens' history of voting in one type of election (Campbell 1960; Ansolabehere & Schaffner 2016; Sciarini et al. 2015; Sigelman et al. 1985; Sigelman & Jewell 1986). In the first part of our analysis, we look at cumulative turnout across three consecutive elections and thus move beyond the vote/not vote variable in a single election. Consequently, we will learn about those who selectively vote in some elections and not in others. We also learn about the abstainers who seem permanently disconnected from the elections under investigation.

To understand these inequalities in turnout further, we apply the law of dispersion, which states that higher general levels of turnout come with higher levels of equality in political participation (Tingsten 1937; Lijphart 1997). We take the analysis one step further and investigate explicitly the variation in turnout inequalities across different types of elections. Despite the prominence of the law of dispersion, only few studies have empirically investigated it, and recent empirical contributions show mixed results as Persson et al. (2013) finds overall support for the law of dispersion, while Sinnott & Achen (2008) finds no support regarding social class and the law of

dispersion. Across the three types of elections, we explore whether the difference in turnout between different sociodemographic groups increases when fewer turn out to vote.

We find substantial inequalities in cumulative turnout. Across the three elections, 9.3 percent of the voters, the abstainers, failed to cast even a single vote while 51.2 percent of the voters, the core voters, voted in all three elections. Notably, the European elections were almost only for the core voters. Only 6.4 percent of the voters cast a vote in the European election but failed to do so in at least one of the other elections. Core voters and abstainers are far from representative of the voters. Core voters are more likely to be female, better educated, and earn higher incomes. They also tend to be older than abstainers, and they are less likely to have a native background. Together, these findings show that the law of dispersion also applies when studying cumulative participation.

We also find evidence supporting the law of dispersion when comparing the individual elections. In low turnout elections, it is especially voters with no or little education who drop off. The differences in turnout across ethnicity also increase as voters of Western background are less behind ethnic Danes in local elections compared to national elections. Finally, we show that the turnout gap regarding education and ethnic background is negatively correlated with turnout in local elections across Danish municipalities. This indicates that inequalities follow the aggregate level of turnout, as predicted by the law of dispersion, and not just the type of election under investigation.

Studying inequalities in turnout and the law of dispersion

Inequalities in voter participation have been on political scientists' agenda for decades. Scholars concerned with the well-being of representative democracy argue that large inequalities in turnout might pose a legitimacy problem for representative democracy as the opinions of the elected politicians become too much out of sync with the attitudes of the citizens (cf. Tingsten 1937: 184).

Furthermore, it is questionable whether the core idea of elections—to elect representatives for the people—can be said to be meaningfully met if inequalities in participation are too large (Lijphart 1997; Wolfinger & Rosenstone 1980).

With such concerns in mind, empirical research has focused on determining who votes as well as what predicts and causes citizens' turnout decision. Of particular relevance regarding inequalities in turnout is the degree to which some sociodemographic characteristics, such as ethnicity, age, gender, and education, predicts turnout. In the existing literature, a substantial amount of research has investigated questions like this in single elections or the same type of elections over time in a given country. In a meta-analysis of 95 published turnout studies from 2000-2010, Smets & Van Ham (2013) show that education, age, residential mobility, region, and turnout history consistently correlate with turnout at the national level. On the other hand, gender, ethnicity, employment, and citizenship correlate with turnout in some settings, but not consistently across studies (*ibid.*).

While these findings are, indeed, useful, there are limitations. First, only 11 percent of the reported studies use validated turnout as the dependent measure (Smets & Van Ham 2013: 346). This leaves them vulnerable to well-known problems of over-reporting of self-reported turnout (Karp & Brockington 2005; Bernstein et al. 2001; Dahlgaard et al. 2018). Furthermore, most studies also use self-reported independent variables such as income and educational attainment, which can also be misreported (Hariri & Lassen 2017). This makes the actual relationship between turnout and sociodemographic characteristics even more uncertain. Second, and related, studies using validated turnout in a European context are very rare (cf. Smets & Van Ham 2013).[1] Third, some factors are likely to be relevant in some contexts and not in others. Indeed, Smets and Van Ham (2013) restrict their sample to include only national elections based on the argument that some independent

[1] Although see Heath (2000) for an exception and new studies (e.g., Bhatti & Hansen 2012; Bhatti et al. 2016; Hansen 2016; Dahlgaard 2018).

variables might affect turnout differently in first-order elections compared to second-order elections (Smets & Van Ham 2013: 345; See also Fieldhouse et al. 2007). Therefore, we still lack knowledge about how different variables correlate with turnout across different types of elections but for the same individuals, which is at the core of the law of dispersion.

The article's first contribution is to fill this knowledge gap by investigating the characteristics of core and peripheral voters as well as the abstainers across elections.[2] Specifically, we ask to what degree inequalities in participation exists across elections. By studying cumulative turnout, we shift the focus from the one-election, voted/abstained variable used in single election studies to participation in multiple consecutive elections. We define cumulative voting as the number of votes cast in three consecutive election.

We can think of the electorate as being made up of a core that votes consistently in any election, a periphery that votes occasionally, and a group of abstainers who do not participate in elections (Sciarini et al. 2015; Ansolabehere & Schaffner 2016). The peripheral voters are less intrinsically interested in politics and know less about politics compared to the core voters (Nawara 2016), and it requires more short-term stimulation such as dramatic issues or events, popular candidates on the ticket, or extensive campaigning to motivate the peripheral voters to participate in the election. The core voters, on the other hand, have sufficiently high levels of political interest to vote in elections, even when the level of political stimulation is relatively weak (Campbell 1960; Fieldhouse et al. 2007). The abstainers are the ones who fail to vote in three consecutive elections. They might simply be politically disengaged or have opted out of the political process.

[2] In this context, the concept of core and peripheral voters refers to frequency of voting, where core voters refer to the type of citizens who manage to vote no matter the type of election. The terminology was introduced by Campbell (1960) and has also been used by Sigelman and Jewell (1986) and, recently, by Ansolabehere & Schaffner (2016).

We are interested in measuring the proportion of the core and peripheral voters as well as the abstainers. On the one hand, if it is different citizens that abstain from election to election, we might be less concerned with the democratic legitimacy of the election as voters will in this sense accept the "social contract" of the election sooner or later. On the other hand, we might be more concerned about the health of representative democracy if it is the same citizens who repeatedly abstain from voting (Sciarini et al. 2015). For instance, research from Geneva, Switzerland, suggests that approximately 20 percent abstain from voting in 10 successive direct votes (Sciarini et al. 2015). In the US, around 37 percent failed to vote in four national elections (two midterms and two presidential) from 2006 to 2012, whereas 25 percent voted in all four elections (Ansolabehere & Schaffner 2016). How the levels are in the context of our study, a European country with a high turnout rate, is descriptively an important question.

The article's second contribution is to apply the logic of the law of dispersion in an analysis of cumulative participation. The law of dispersion refers to the idea that inequalities in turnout increases when aggregate turnout declines (Tingsten 1937; Lijphart 1997; Rosenstone & Hansen 1993; Persson et al. 2013). In this way, lower turnout equals larger inequalities in descriptive representation.[3] While the scholarly focus primarily has been on comparing turnout inequalities in different types of elections, we extend the logic of the law of dispersion to an analysis of turnout inequalities across multiple elections of the same type. We do this by investigating the

[3] Empirical investigations of Tingsten's law are rare, but some examples exist. Rosenstone and Hansen (1993) compare average midterm and presidential election turnout between 1952 and 1988 for different subgroups and argue that Tingsten's law of dispersion holds firm in a US context. Likewise, Persson et al. (2013) study the sociodemographic composition of the electorate in a Swedish county in a 2010 election and a re-election in 2011 and conclude that the inequalities in turnout do increase when turnout declines. Finally, Sinnott and Achen (2008) argue that the law of dispersion holds in Europe and US for most demographic categories, but that Lijphart's (1997) focus on social classes is misguided.

sociodemographic characteristics of the different groups introduced above across almost a hundred municipal elections held simultaneously.

It is especially important to investigate the characteristics of the abstainers, those disconnected from the electoral process. Furthermore, knowledge about the social profile of the groups can tell us whether the peripheral voters look mostly like the core voters or the abstainers. In the Swiss study, peripheral voters share most characteristics with the abstainers (Sciarini et al. 2015). In both the American and Swiss studies, older voters are more likely to be core voters (Ansolabehere & Schaffner 2016; Sciarini et al. 2015). Additionally, ethnic minorities are less likely to be consistent voters in the US context. In this article, we explore whether core and peripheral voters are also descriptively different in a high-turnout context. Compared with the previous studies, our article has the additional advantage of access to a rich set of sociodemographic variables none of which is self-reported. In addition to the variables discussed above, we expect that citizens with higher levels of education are less likely to be abstainers; a pattern which has previously been documented in Denmark and single election studies in many other countries (cf. Smets & Van Ham 2013; Bhatti & Hansen 2012; Bhatti et al. 2016b; Persson 2015).

The article's third contribution is an analysis of the law of dispersion in the traditional way by analyzing the sociodemographic patterns in turnout in different types of elections. If some voter groups are more likely to drop off from the electorate than others in certain elections, we could see descriptive differences between the general electorate and those who exercise their right to vote. Perhaps differences in drop-off rates are non-monotonic, and some groups initially see the largest drop-off rates while other groups catch up in terms of drop-off if turnout falls even lower. In that case, we could imagine turnout to be descriptively more equal when turnout is, say, 50 percent instead of 70. Consequentially, whether differential levels of turnout increase or decrease

differences across groups, voter participation depends on what type of voters drop out of the electorate when turnout declines and at what point (Sinnott & Achen 2008).

Furthermore, we could imagine different types of voters to drop off in different types of elections. For instance, we might imagine that highly educated, young citizens are likely to follow European politics more intensively and thereby be more likely to vote in low-salience European elections than young citizens with less education. At the same time, this group might be less invested in local government issues and thus be the first to drop off in local elections. Thus, we can imagine the aggregate turnout being the same in two different types of elections, but with widely different turnout across groups since different kinds of voters are less attracted to different kinds of elections. Whether this is the case is an empirical question, which we analyze in this article and thereby contribute with an analysis of the law of dispersion in a high-turnout context in three types of elections.

Data and context: Three Danish elections from 2013-2015

We use data from three Danish elections from 2013-2015, specifically the Danish municipality elections held in November 2013, the European elections in May 2014, and the parliamentary election held in June 2015. While Denmark has a high turnout compared to most other European countries, we note that the participation ratio between the national election and European parliamentary election in Denmark is around 3:2, which is similar to the participation ratio across 27 EU countries.[4] Thus, even though turnout in Denmark is generally high, the relative differences

[4] The ratio is calculated by dividing turnout at the latest national election by turnout at the European Parliament elections of 2014, based on figures from IDEA (IDEA International 2016). Missing data from Latvia explains why only 27 countries are included. Unfortunately, similar data for turnout in local elections are not available in a form that enables the same type of calculation.

in participation between elections are similar, which arguably makes the analysis even more useful for understanding turnout dynamics in other European countries.

In Denmark, there is substantial variation when it comes to the saliency of the elections and the average participation levels over time. In table 1, we display turnout rates in the most recent of each type of election. National elections are called by the prime minister under the restriction that the election must be held within four years of the latest election. To vote, one must be at least 18 years old on Election Day, have Danish citizenship, be a permanent resident in the realm, and not be under guardianship. The national elections involve extensive campaigning and wall-to-wall coverage in most media outlets. The average turnout from 1970-2015 has been 86.3 percent In other words; the Danish national elections are highly salient.

Table 1: Descriptive overview of the elections

	Local 2013	European 2014	National 2015
Actual turnout (%)	71.9	56.3	85.9
Eligible citizens (N)	4,409,251	4,141,329	4,145,105
n in our sample	4,362,156	2,339,064	3,097,536
Turnout in our sample (%)	71.9	56.5	85.8
Turnout for panel part of sample (%, N=2,093,796)	74.8	57.5	86.3

Local elections take place simultaneously in November every four years across all 98 Danish municipalities. The turnout has averaged approximately 70 percent over the last 40 years. Eligible to vote are those who can vote in the national elections, EU citizens and citizens from Norway and Iceland with a permanent residence in Denmark, and non-EU citizen with at least three consecutive years of permanent residency in the country before the election. They also must be 18 years of age and not be under guardianship. Consequentially, the number of eligible citizens is higher for local elections (cf. table 1). The municipalities play a key role in providing welfare services and decide on tax levels with some degree of autonomy. While they are less salient than national elections, the

local elections are still highly visible in the streets and media in the period running up to the election, and they are relatively high-salient in a comparative perspective.

European elections draw the least attention of the three types of elections and are in a Danish context perceived as second-order elections (cf. Reif & Schmitt 1980; Schmitt 2005). There is less campaigning, and the media attention is less intense and of a shorter duration. The turnout has averaged around 50 percent, which still places the Danish turnout levels among the highest in the EU countries without compulsory voting. Overall, the European elections in Denmark can be categorized as a low to medium salient event. In the European elections, voters from EU countries who are 18 years of age and permanent residents in the country can vote if they are not under guardianship.

All three elections follow proportional representational principles. All eligible voters are automatically registered to vote and receive a voting card approximately 10 days before the elections, and the logistic barriers for voting are quite low.[5]

In our study, we use validated turnout that stems from the official voter lists. In Denmark, voter lists are usually destroyed shortly after the election. However, in 2013, 2014, and 2015 we received permission to collect the lists, and all municipalities were encouraged to send the lists in digital form to us. In case the lists were not digitized, the municipalities had to do this before delivering them to us. In 2013, all municipalities delivered the information, 61 municipalities delivered in 2014, and 72 municipalities in 2015. Thus, we have an almost complete dataset for the 2013-election, but somewhat incomplete datasets for the rest of the elections. The lack of turnout data is due mostly to some polling stations using manual voter lists and the municipalities not having

[5] Voters can cast an early vote up to three months ahead of the elections by going to a pre-election polling place, an option used by four to nine percent of the voters in the three elections (Bhatti et al. 2016c). Citizens' cannot use mail-in voting.

resources to digitize the lists in all elections. Early voters are also validated and correctly classified as having cast a vote.

It is important to highlight that there was little room for self-selection in the study at the individual level. If voters were assigned a polling station that delivered turnout information to our research team, their turnout data would go into the study without further ado. However, when studying cumulative voting, we use only voters with complete voter records. As an implication, there will be voters who are excluded based on their moving patterns if they have moved from one municipality with recorded turnout in one election to one without turnout in another election. Likewise, some voters have had a moving pattern where had they not moved they would have been excluded because they had stayed in a municipality without recorded voter turnout. Compared to alternative ways of tracking voters these are very limited attrition problems. Survey investigations of multiple elections potentially suffer from the challenge of differential self-selection depending on the type of elections which makes the results from the various elections incomparable. In sum, even though the turnout data is incomplete, a large panel dataset without individual-level self-selection or self-reporting of either voting or any covariates is a leap forward for the turnout literature, and it is particularly important for empirical analysis of the law of dispersion.

In our analysis, we focus on the panel part of the dataset. Consequentially, citizens who were not eligible to vote in one of the elections are removed from the dataset. In practice, this means that the minimum age in the dataset is approximately 19 years and seven months. Furthermore, due to the difference in eligibility, a group of non-Danish citizens who can vote in local elections, but not in national or European elections, are removed from the analysis. Since non-Danish citizens and young people turn out at quite low rates, removing them also explains why, in table 1, we see that turnout in the panel part is approximately three percentage points higher than the actual turnout in the local and the European elections. We also remove individuals who in at least one election lived

in a district that did not supply turnout information to the study. Finally, we remove citizens for whom we lack information about one of the independent variables that we are applying in the analysis (38,086 observations). Altogether, the dataset covers a unique individual-level register data on turnout and hundreds of sociodemographic variables for 2,093,796 citizens across the three elections.

The turnout data are merged with administrative data from *Statistics Denmark.*[6] All Danes have a unique civil registration number which in an anonymized form is used to link a wide range of variables from administrative records maintained by *Statistics Denmark.* The data include variables that are often used in turnout studies, such as education, age, gender, marital status, ethnicity, and so forth. Since they are administratively collected, they are full population records without individual self-reporting. Our unique data quality further strengthens the empirical contribution to the understanding of individual-level turnout behavior in a European, relatively high-turnout context.

[6] The data is stored on servers at *Statistics Denmark.* Due to security and privacy reasons, the data cannot be made available on the Internet.

Analysis

Cumulative turnout and inequality

Table 2 presents an overview of the cumulative turnout across the three elections.

Table 2: Voting patterns in three elections

Voter type	Local 2013	European 2014	National 2015	%	N
Abstainers	Did not vote	Did not vote	Did not vote	9.3	194,484
Peripheral (1/3 votes)	Voted	Did not vote	Did not vote	2.7	55,528
	Did not vote	Voted	Did not vote	0.6	12,168
	Did not vote	Did not vote	Voted	10.8	226,112
Peripheral (2/3 votes)	Voted	Voted	Did not vote	1.2	25,197
	Voted	Did not vote	Voted	19.7	413,445
	Did not vote	Voted	Voted	4.6	95,567
Core	Voted	Voted	Voted	51.2	1,071,295
Total				100	2,093,796

Table 2 reveals considerable variation in turnout patterns. We see that 9.3 percent failed to vote in all three elections (row 1 in table 2), thereby being categorized as abstainers. At the other end, 51.2 percent voted in all three elections. These are categorized as core voters. This leaves around 40 percent, the peripheral voters, who vote in some, but not all, elections. Within this group, there is some noteworthy variation. For instance, approximately 14 percent voted in one election (rows 2-4 in table 2), and most of these participated in the national election. Likewise, 25.5 percent voted in two elections (rows 5-7 in table 2), again in most cases with one of the elections being the national election. The European elections are also revealed to be the least appealing in table 2. Only 5.8 percent voted in the European elections but failed to do so in one of the other elections, and just 0.6 percent voted in that election alone. Combined, only 6.4 percent of the voters participated in the European election without participating in at least one of the other elections. Finally, only 1.8 percent voted in the European elections without voting in the national elections. In other words, it is

almost exclusively core voters who bother to vote in the European elections, and almost no one votes exclusively in those elections.

Next, we look at the characteristics of the groups. In table 3, we present some descriptive demographics for the abstainers, the peripheral voters, and the core voters to highlight any inequalities in turnout across groups. We see substantial differences in the sociodemographic composition of the three groups. Non-Western voters comprise 12.4 percent of abstainers compared to 3.8 percent of all voters and only 1.3 percent of core voters. Even though there are more than five times as many core voters than abstainers, voters with a non-Western background are still more likely to be abstainers than core voters. This pertains even though only individuals with Danish citizenship are eligible to vote in national elections, meaning the group with a non-Western background in the table is all citizens and have been permanent residents of the country for many years. There is also a substantial educational gap between the groups. Citizens with a higher education make up 39 percent of the core voters and only 11 percent of the abstainers. Furthermore, there is a large gap in terms of income with core voters earning 52 percent more than abstainers. We also see a higher share of women in the core group than in the abstainer group.

Table 3: Demographic characteristics of abstainers, peripheral, and core voters

	Female (share, %)	Age (mean, years)	Non-Western background (share, %)	Higher education (share, %)	Yearly income (DKK)	N
Abstainer (0/3)	46.6	47.5	12.4	11.1	236,215	194,484
Peripheral (1/3)	49.7	44.5	7.4	19.4	284,654	293,808
Peripheral (2/3)	52.2	48.0	3.7	26.9	319,618	534,209
Core voter (3/3)	52.1	53.2	1.3	39.4	359,131	1,071,295
Mean	51.3	50.1	3.8	30.8	327,182	2,093,796

Note: All demographic information is from the time of the 2015 election. Non-Western background refers to immigrants and descendants from non-Western countries, a category defined by Statistics Denmark[7]. Higher education consists of citizens who have completed either a higher education (e.g., school teachers) or a college education. The large sample size implies that even very small differences are statistically significant.

In table A1 in the appendix, we show three regression analyses with cumulative participation as the dependent variable and the variables in table 3 as independent variables alongside with other control variables and municipality fixed effects. These analyses are in line with the results in table 3 and confirm most of the predictions. Though we in no way claim causal relationships, we can conclude that over three elections gender, age, income, ethnicity and educational attainment are strong indicators of voting. We think this an important descriptive finding also in the light of increased immigration to Western Europe in the recent years and the possible consequence for future turnout.

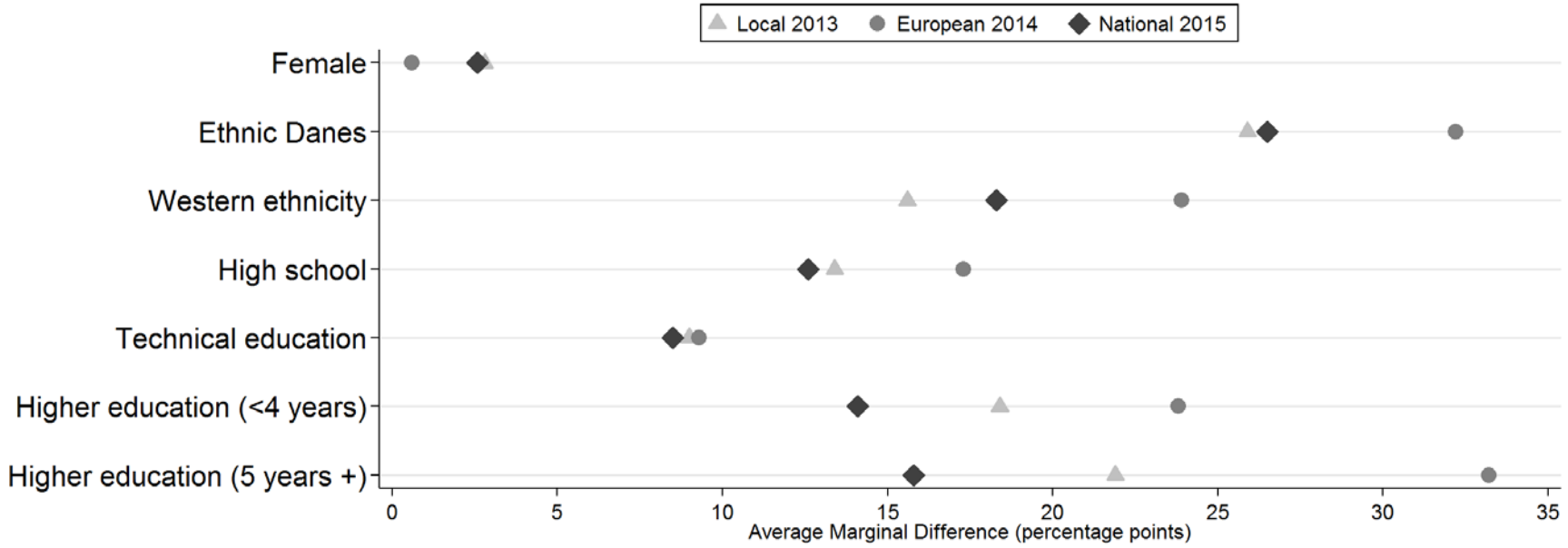
The predictors of turnout in different types of elections

So far we have shown that sociodemographic variables predict cumulative voting. A related question is if the law of dispersion applies. To investigate this, we now turn to studying each of the

[7] Individuals are classified as native Danes if at least one parent was born in Denmark and holds Danish citizenship, irrespective of whether the individuals were born in Denmark and/or hold Danish citizenship themselves. Individuals who do not meet these criteria are, following Statistics Denmark, considered either immigrants (if they were born outside Denmark) or descendants (if their parents were born outside Denmark).

elections independently. Below, we compare how different sociodemographic variables predict turnout across our three types of elections. Are the predictors stronger in elections with lower turnout as the law would suggest? We conduct three regression analyses using the same covariates. For each regression, we switch the dependent variable to be turnout in each of our election years in turn. That way, we learn how strong predictors each of our variables of interest are of turnout in each of the elections. For each of the elections, we conduct a regression analysis including the same variables as in the analysis of cumulative participation including municipality-level fixed effects. We present the average marginal differences for our variables of interest based on figure 1 and show the complete models in the appendix.

Figure 1: The average marginal difference on voter turnout in three elections



Note: The average marginal difference in turnout of the mentioned variables on turnout compared with their relevant reference group, which is non-Western ethnicity for ethnicity and primary school for education. For instance, all-else-equal, females vote 2.8 percentage points more than males in local elections in 2013. See table A2 in the appendix for complete models including standard errors.

Figure 1 shows that the turnout gap tends to be smallest in the high-turnout national elections for all groups except for the gender differences, where the gap is nonexistent in the European elections, and for differences between voters with a non-Western background and the two other groups. Compared to ethnic Danes, the difference is practically the same in local and national elections. Compared to voters with a Western background, the difference is smaller in local elections than in the national election. Especially in the European elections and with respect to education, in general, the law of dispersion holds firm: In the elections with the lowest turnout rates, the differences between subgroups of the electorate are large. The picture is particularly interesting for two groups. First, the ethnic groups' participation differs a lot, and ethnic Danes participate much more than immigrants and descendants of both Western and non-Western background. The average difference between ethnic Danes and citizens with a non-Western background is around 25-26 percentage points in both the local and national elections. In the lower turnout European election, the corresponding number is 32 percentage points. For the Western group, the differences are smaller, and the turnout gap is, in fact, a bit smaller in the local than in the national elections. Thus, with the Western group, the pattern does not completely follow the law of dispersion.

Second, the education gap is striking. Compared to people with a primary school education, the positive average marginal effect of being higher educated is substantial across all educational categories. Furthermore, the average marginal effect of more education on turnout is considerably larger in local elections and in particular in the European elections. For instance, the average marginal difference in turnout between those having completed more than five years of higher education and those having completed only elementary school is 16 percentage points in the national election, 22 percentage points in the local election 2013, and 33 percentage points in the European election. It seems that the image of the European Union being a project that appeals primarily to the highly educated citizens is a somewhat fair picture.

Additional evidence: Investigating the law of dispersion across municipalities

So far, we have analyzed the law of dispersion by comparing the turnout gap for the same voters in three different types of elections with varying levels of overall turnout. Though the analyses have been consistent with the theory, a potential challenge to the analysis is that it could be differences regarding the types of elections that explain the increasing gap in turnout at the European and local elections compared to the national election.

Local elections provide us with an opportunity to investigate whether the size of the turnout gap remains related to the aggregate turnout when the voters are different, but the elections are similar. In Danish local elections, turnout varies substantially between the municipalities, ranging from 61.2 percent in Copenhagen to more than 80 percent in some municipalities. While each municipality has its particular political agenda and election dynamics, the local elections are, in general terms, similar for the citizens. No matter where the voters live, they vote for a politician or party to represent them in local politics, and the parties are, for the most part, the same national parties.

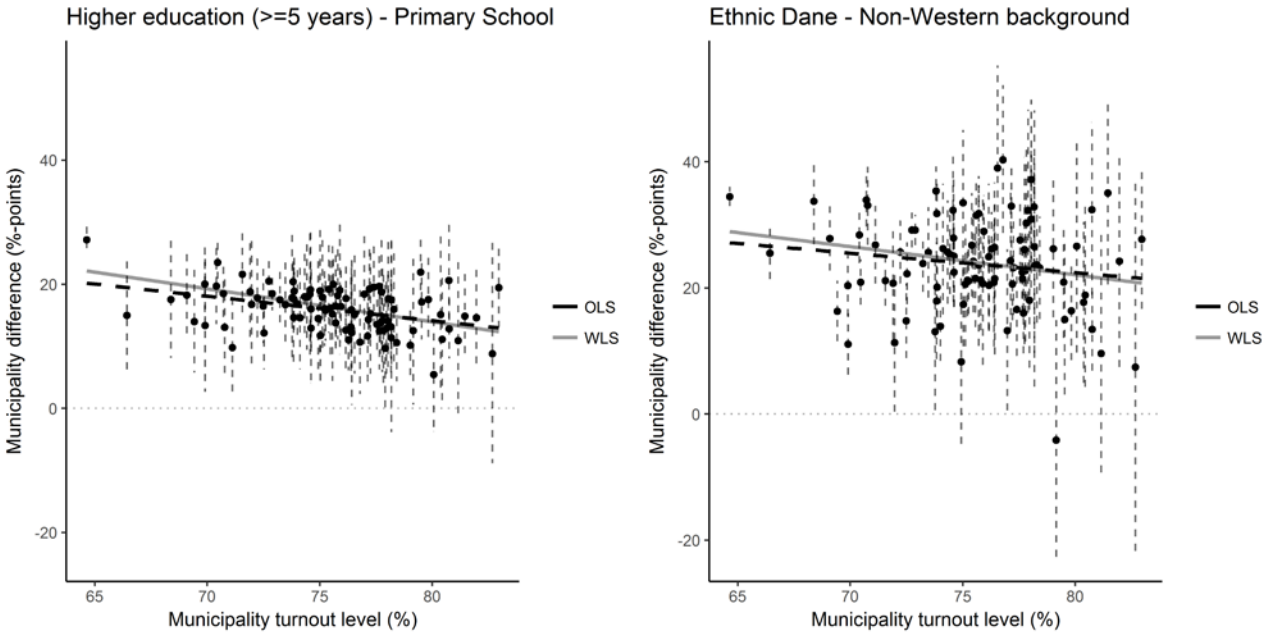
In figure 2 (left panel), we plot the difference in turnout between citizens with the lowest level of education and the highest level of education in 95 municipalities in the 2013 local elections.[8] The municipality-specific difference is from a hierarchical Bayesian model with municipality-specific coefficients for education, ethnicity, and gender.[9] The same individual-level control variable as in

[8] We exclude the three small municipalities of Læsø, Ærø, and Samsø as they each have too few citizens with either a non-Western ethnic background or a higher education to conduct the analysis.

[9] Some municipalities have few voters in some categories, which mean that if few voters for some arbitrary reason vote/abstain, they could have a great impact on the cross-municipality estimates. When we fit a Bayesian hierarchical with non-informative priors, the municipality-specific effects are sampled from the same overarching distribution. This way, the estimates become a compromise between the strength of the signal of the municipality-specific effects and the precision of the

figure 1 is included. As the trend line shows, the educational gap in turnout is negatively related to aggregate turnout. In the right panel, we get the same picture when comparing citizens with an ethnic Danish background to citizens with a non-Western ethnic background.

Figure 2: Turnout gap at different levels of turnout in the local elections 2013



Note: The left panel shows the relationship between turnout and the difference in turnout between voters with a high education and voters with no education beyond public school. The dots are point estimates of the differences from the Bayesian hierarchical model with 95% credible intervals. The dashed black line shows the relationship when estimated as an ordinary least square regression (OLS). The solid grey line shows the relationship from a regression where the points are weighted by their precision. The right panel shows the relationship between turnout and the difference in turnout between voters with a non-Western background and an ethnic Danish background.

While the differences implied by the trend lines at a glance might seem small, they are not trivial. For instance, when turnout is one percentage point higher, the educational gap is predicted to

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overarching prediction of municipality effects. In other words, the Bayesian model reduces the risk that we make inferences based on outliers from small municipalities with weak signals.

be 0.4 percentage points lower. Likewise, each one percentage point increase in turnout is associated with a 0.3 percentage points drop for the predicted turnout gap between citizens with an ethnic Danish background and a non-Western ethnic background. The analysis does not change substantially if we weight by the precision of the municipality differences (see appendix table A3 for regression tables). Overall, the declining turnout gap illustrated in figure 2 is consistent with the analysis in figure 1. This finding shows that when we compare different voters over similar elections we arrive at the same conclusion as when we compare the same voters over different elections: As predicted by the law of dispersion, tower rates of turnout are related to higher differences in turnout between social groups.

Conclusion and discussion

We have explored what predicts cumulative turnout and what characterizes those who always and never vote. So far, little empirical attention has been given to cumulative turnout outside the U.S., and the existing research often suffers from having access to only few variables and in many cases just self-reported turnout. Using validated turnout and highly reliable register-based background information from a panel of 2.1 million Danish citizens across three elections, we add important empirical knowledge about turnout patterns across elections. Our analyses show that in the Danish high-turnout context, around 51 percent of the citizens are core voters and around 40 percent enter and exit the electorate from election to election. The share of core voters is markedly larger than in lower-turnout countries like the US and Switzerland. On the other hand, more than nine percent abstain at every election across consecutive elections. This is quite remarkable since voting in this context is a very easy and low-cost act to do, and the norm of voting is extremely strong in Denmark. When citizens do not even manage to vote here, it is quite likely that they also abstain

from participating in other forms of political and societal activities (cf. Stolle & Hooghe 2005; Pattie et al. 2003), although we emphasize that this is a topic for future research, and here we have not offered empirical support for this proposition. Indeed, one might wonder how they can be mobilized to take part in elections.

The abstainers did not vote in any of the three consecutive elections, that is, this group did not engage at all with the social contract of representative democracy. These eligible non-voters are dominated by relatively many non-native Danes and many with low levels of education. It is worrisome that almost one-tenth of the electorate simply does not give their support to the core of representative democracy by failing to participate in elections. There might be many less troubling reasons to miss a single election, but missing three consecutive elections signifies that a share of the public consistently has no wish to participate. It is not only worth monitoring the size of the group in future elections but also to engage in mobilization efforts to provide the best opportunities for this group of habitual non-voters to become familiar with democracy.

The law of dispersion provides a good framework to understand cumulative turnout and what characterizes core voters, irregular voters, and abstainers. According to Tingsten's (1937) law of dispersion, the general rule is that voting frequencies rise with rising social status and that the differences in turnout are lower the higher the general turnout is (Lijphart 1997). Or put differently the higher the salience of the election, the more equal is the participation across social demographic factors and vice versa. Our findings suggest that rather than irregular voters being a special category of voters, propensity to drop out is a linear function of the salience of the election. In order words, irregular voters can be seen as somewhere between abstainers and core voters. In this sense the abstainers do not seem to have unique characteristics, but are instead voters that on average are more likely to be men, have less education, and are less likely to be ethnic Danes, which suggest that is possible to mobilize them specially in high salience election.

For cumulative participation, we can use the logic of the law to pose the question whether the differences in voter participation for various sociodemographic groups are larger when the number of consecutive elections in which they have participated declines. Looking at the composition of the groups, we learn that a substantial share of the core voters have finished a higher education, have a higher income, and are less likely to have a non-Western background. The opposite is the case for the abstainers, where there is a substantial overrepresentation of citizens with a non-Western background and with less education. From a model with background variables, we learn that ethnic background and educational attainment are strongly correlated with cumulative participation. Higher educated and ethnic Danes are more likely to participate in multiple elections. Thus, the inequality across sociodemographic groups that single-election studies often find also holds firm for cumulative turnout.

In the final part of our analysis, we applied the law of dispersion in a more traditional way and looked at the predictors of turnout in each of the elections to find out whether the difference in turnout between different sociodemographic groups varies across election type. In a context where turnout varies from 56.3 percent in the European Parliament election over 71.9 percent in the local elections to 85.9 percent in the national election, our analysis mostly confirms the law of dispersion but adds some new nuances. Regarding ethnic background, the difference between the group least likely to vote, voters with a non-Western background, and the group most likely to vote, ethnic Danes, is largest in the European election but practically equivalent in the local and the national elections. Compared to voters with a Western background, voters with non-Western background fall further behind in the national election than in the local elections. For education, the law of dispersion holds firm. This also means that peripheral voters mainly drop out of second order elections, but are more mobilized in first order elections.

The findings are sobering for those who, like Mr. Verhofstadt in our introductory quote, care about the representativeness of the voters in the European elections. Education strongly predicts turnout in the European elections, as does ethnicity. Thus, as the law of dispersion would predict, European elections seem to be the least representative of the general population of voters.

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Appendix

Table A1: The predictors of cumulative participation (OLS regression)

	(1)	(2)	(3)
Female	0.057*	0.050*	0.057*
	(0.001)	(0.001)	(0.001)
Age	-4.880*	-12.446*	-13.044*
	(0.085)	(0.097)	(0.099)
Age^2	1.602*	2.975*	3.074*
	(0.017)	(0.019)	(0.019)
Age^3	-0.001*	-0.002*	-0.002*
	(0.000)	(0.000)	(0.000)
Ethnic background (base=Danish)			
Western ethnicity	-0.229*	-0.282*	-0.275*
	(0.007)	(0.007)	(0.007)
Non-Western ethnicity	-0.879*	-0.805*	-0.854*
	(0.004)	(0.004)	(0.004)
Education (base = elementary school)			
High school		0.440*	0.430*
		(0.003)	(0.003)
Technical education		0.294*	0.271*
		(0.002)	(0.002)
Higher education (4 years or less)		0.605*	0.570*
		(0.002)	(0.002)
Higher education (5 years or less)		0.785*	0.729*
		(0.003)	(0.003)
Income (million DKK)		0.012	0.009
		(0.005)	(0.004)
No public benefits (full time employed)		0.071*	0.032*
		(0.002)	(0.002)
Living with others			0.264*
			(0.002)
Living with children under 26 years			0.170*
			(0.002)
Constant	2.267*	3.008*	2.901*
	(0.013)	(0.015)	(0.015)
Observations	2,093,796	2,093,796	2,093,796
Adjusted R^2	0.085	0.144	0.165

Note: OLS regression with municipality-level fixed effects. * $p < 0.001$. Robust standard errors in parentheses. Dependent variable is number of elections participated in and ranges from 0 to 3. Independent variables are from the time of the 2015 election. Ethnicity refers to country of birth and parents' descent. Multinomial logit regressions provide results consistent with OLS results. The results from the multinomial logit shows that voting once, twice, three times, and in all four elections aligns in fairly equal distances, which is an assumption when we use OLS.

Table A2: The predictors of voter turnout in three elections (OLS regression)

	2013	2014	2015
Female	0.028*	0.006*	0.026*
	(0.001)	(0.001)	(0.000)
Age / 100	-4.957*	-5.398*	-3.080*
	(0.042)	(0.045)	(0.039)
Age^2 /100	0.115*	0.127*	0.722*
	(0.001)	(0.001)	(0.008)
Age^3 /100	-0.001*	-0.001*	-0.000*
	(0.000)	(0.000)	(0.000)
Ethnicity (base = non-Western)			
Danish ethnicity	0.259*	0.322*	0.265*
	(0.002)	(0.002)	(0.002)
Western ethnicity	0.156*	0.239*	0.183*
	(0.004)	(0.004)	(0.003)
Education, completed (base=Primary school			
High school	0.134*	0.173*	0.126*
	(0.001)	(0.001)	(0.001)
Technical education	0.090*	0.093*	0.085*
	(0.001)	(0.001)	(0.001)
Higher education (4 years or less)	0.184*	0.238*	0.141*
	(0.001)	(0.001)	(0.001)
Higher education (5 years or more)	0.219*	0.332*	0.158*
	(0.001)	(0.001)	(0.001)
No public benefits	-0.005*	-0.005*	0.009*
	(0.001)	(0.001)	(0.001)
Living with others	0.103*	0.091*	0.077*
	(0.001)	(0.001)	(0.001)
Children under 26 years living at home	0.087*	0.026*	0.045*
	(0.001)	(0.001)	(0.001)
Income (logged)	0.010*	0.008*	0.017*
	(0.000)	(0.000)	(0.000)
N	2,093,796	2,093,796	2,093,796
Adjusted R^2	0.108	0.114	0.098

Note: * $p < 0.001$. Municipality fixed effects are included in all models. Robust standard errors in parentheses. Binary logit regressions provide results consistent with OLS results.

Table A3: Change in turnout gap when turnout increases (OLS regression)

	Dependent variable			
	Education: Primary school → higher education		Ethnic background: Danish → Non-western	
	(1)	(2)	(3)	(4)
Turnout	-0.393	-0.535	-0.308	-0.447
	(-0.096)	(-0.092)	(-0.219)	(-0.176)
Constant	45.551	56.713	47.07	57.799
	(-7.296)	(-6.937)	(-16.581)	(-13.116)
Weight included?	NO	YES	NO	YES
Observations	95	95	95	95
R^2	0.152	0.266	0.021	0.064
Adjusted R^2	0.142	0.258	0.01	0.054
Residual Std. Error (df = 93)	3.286	0.917	7.467	1.778
F Statistic (df = 1; 93)	16.611	33.647	1.981	6.407

Note: Robust standard errors in parentheses. The models can be interpreted as the change in turnout difference for the mentioned groups when aggregate turnout increases by one percentage point. For instance, when turnout increases by one percentage point, the turnout gap between citizens with primary school and higher education decreases with -0.393 percentage points. As is visible from figure 2, some municipalities have wider confidence intervals than others, for example because of fewer citizens and few observations in one of the categories in the analysis. The weighted models take this precision of the municipality differences into account (i.e., municipalities vary in population size).