Article

Subnational Patterns of Participation: Compulsory Voting and the Conditional Impact of Institutional Design

Political Research Quarterly
2018, Vol. 71(4) 826–841

DOI: 10.1177/1065912918763746
journals.sagepub.com/home/prq
SAGE

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Abstract

Cross-national studies of turnout find that compulsory voting has the strongest impact on participation, boosting turnout by 10 to 18 percent. We argue that in the absence of compulsory voting, other institutional factors such as small district size, strong electoral competition, and moderate candidate fragmentation may be similarly effective at mobilizing turnout. Where voting is mandatory, these factors should instead primarily influence *how people vote* once they are at the polls—diminishing levels of invalid voting, and consequently increasing *effective* turnout. We take advantage of the abolition of compulsory voting in Chile to test our expectations immediately before and after reform, in the exact same electoral districts. Using this unique subnational research design, we leverage data from more than 1,000 mayoral elections over the course of three electoral cycles and across 345 municipalities to examine patterns of turnout and invalid voting. Results show that small district size, strong electoral competition, and moderate candidate fragmentation are effective at reducing invalid voting when turnout is compulsory, and fostering higher levels of turnout when voting is voluntary.

Keywords

compulsory voting, turnout, invalid voting, subnational institutions, election reform

Electoral participation is central to democracy, as it determines who wins elections and consequently which policies are passed into law. For this reason, electoral institutions that influence turnout have attracted considerable attention from scholars and practitioners. Institutions are among the clearest predictors of electoral participation (Fornos, Power, and Garand 2004; Stein and Vonnahme 2008; Vonnahme 2012), with compulsory voting having the strongest impact (Blais 2006; Fowler 2013; Jaitman 2013; Singh 2011). In addition, small district size, strong electoral competition, and moderate levels of candidate fragmentation—which we term *mobilizing institutions*—promote voter turnout (Cancela and Geys 2016; Geys 2006). Yet, extant research has not considered how compulsory voting laws condition the relationship between mobilizing institutions and electoral participation, which we contend is crucial to understanding when and how institutions shape participation.

An election law reform that took place in Chile in 2011 presents a unique opportunity to investigate this relationship. Chile abandoned compulsory voting in 2011. In the subsequent election, overall turnout dropped by 17 percentage points. But, a closer look into subnational patterns revealed significant variation in the change in the levels of electoral participation within districts—despite compulsory voting being abolished across all municipalities. Whereas conventional wisdom suggests that electoral participation would decline on average across all districts, turnout actually *increased* in about one-third of the districts. These patterns suggest that other institutional features are equally important predictors of electoral participation.

We argue that institutions influence two key aspects of electoral participation: (1) overall levels of turnout and (2) levels of invalid voting. We first posit that conditional on voluntary voting, mobilizing institutions will promote higher levels of *overall turnout*. In compulsory systems, by comparison, we should observe significantly less systematic variation in turnout across mobilizing institutions—given that turnout is mandatory—but mobilizing institutions should instead have stronger influence on levels of invalid voting. As compulsory voting laws do not force individuals to cast a valid vote, invalid voting is frequently considered a form of abstention when voting is

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mandatory (Gray and Caul 2000). Therefore, although mobilizing institutions should have a stronger influence on overall levels of turnout when voting is voluntary, they are more likely to affect *effective* turnout (i.e., valid voting) under compulsory voting. Although this may seem intuitive, previous research has not considered how political institutions influence participation differently in compulsory and voluntary systems (Blais 2006; Cancela and Geys 2016; Singh 2011). As a result, cross-national analyses of turnout have likely underestimated the importance of mobilizing institutions for promoting turnout. Our analyses show that mobilizing institutions are effective at fostering higher levels of turnout when voting is voluntary, and reducing invalid voting when turnout is obligatory.

This research makes several contributions to the existing literature on political institutions. First, we develop hypotheses about the conditional relationship between institutions and participation, expanding beyond the plethora of research that examines the direct effect of compulsory or voluntary laws on participation while simply controlling for other institutional features. Second, we consider electoral participation to be a broader concept that includes not only turnout but also invalid voting, allowing us to distinguish between overall turnout and *effective* turnout. Our research thus contributes to the bourgeoning body of work on the determinants of invalid voting (Hill and Rutledge-Prior 2016; Katz and Levin, forthcoming), as well as literature that argues invalid votes provide important information about citizens' dissatisfaction with politics (Driscoll and Nelson 2014; Uggla 2008).

Finally, the data limitations imposed on this question until now have only allowed scholars to compare electoral participation in countries employing compulsory voting (half of which are in Latin America) with countries that do not use compulsory voting.[1] The reform in Chile provides a unique opportunity to investigate this question at the subnational level (Barnes and Rangel 2014; Rangel 2017). In contrast to cross-national analyses, a major advantage of subnational research designs is that they enable us to test our expectations immediately before and after reform in the exact same electoral districts (e.g., Barnes, Tchintian, and Alles 2017; Hinojosa and Franceschet 2012) across a larger number of observations than is possible in cross-national analyses while exploiting important variation (e.g., Holman 2013, 2014; Shair-Rosenfield and Hinojosa 2014; Vonnahme 2012, 2014). In this case, we leverage subnational variation on mobilizing institutions from 1,000 mayoral elections across 345 municipalities pre and post reform to offer a controlled comparison across units and over time, where other potentially confounding contextual factors are held constant within and between elections.

Compulsory Voting and Electoral Participation

Electoral institutions are among the strongest predictors of turnout (Blais 2006; Cancela and Geys 2016). Compulsory voting laws in particular have the strongest and most consistent impact on electoral participation, especially when penalties on those who abstain are strict and enforced (Panagopoulos 2008; Singh 2011). Even in the absence of enforcement mechanisms, for those who want to be perceived as law-abiding citizens, getting caught disobeying the law may impose social costs on citizens (Funk 2007; Geys 2006). Studies have shown that the relationship between compulsory voting and turnout is robust in magnitude; countries where voting is mandatory display turnout rates that are anywhere between 10 and 18 percentage points higher than their voluntary counterparts (Bechtel, Hangartner, and Schmid 2016; Jaitman 2013; Singh 2011).

When the Netherlands abandoned compulsory voting in 1970, overall turnout decreased from 94.6 to 74.1 percent (Irwin 1974). The abolition of compulsory voting in Chile was also associated with a significant decline in overall turnout rates (Barnes and Rangel 2014). Because election law reform is rare, others have used public opinion polls in an attempt to estimate the consequences of a reform in countries with mandatory voting. When asked whether they would turn out to the polls if voting became voluntary, citizens in Belgium (Hooghe and Pelleriaux 1998) and Brazil (Elkins 2000) indicated a lower willingness to vote.

Mandatory voting, however, is also known to increase the level of invalid votes (McAllister and Makkai 1993; Uggla 2008). When going to the polls, citizens are given the option to either cast a valid vote, vote "blank," or to (intentionally or unintentionally) "spoil" their ballot resulting in a null vote. In a compulsory system, voting blank or null is often equated with abstention (Gray and Caul 2000). This is because although invalid voting might also be an option in countries with voluntary voting, citizens who do not wish to cast a valid vote will likely abstain from turning out altogether.

In sum, an abundance of research has examined the direct effect of compulsory voting on electoral participation. Yet, research has not considered how compulsory voting conditions the relationship between other institutional features and electoral participation (turnout or invalid voting). For instance, numerous political institutions are shown to mobilize turnout (such as proportional representation and efficient voter registration; Blais and Aarts 2006; Vonnahme 2014). We argue that compulsory voting conditions the impact of other political institutions on participation—although compulsory voting is designed to affect all districts the same, we expect that

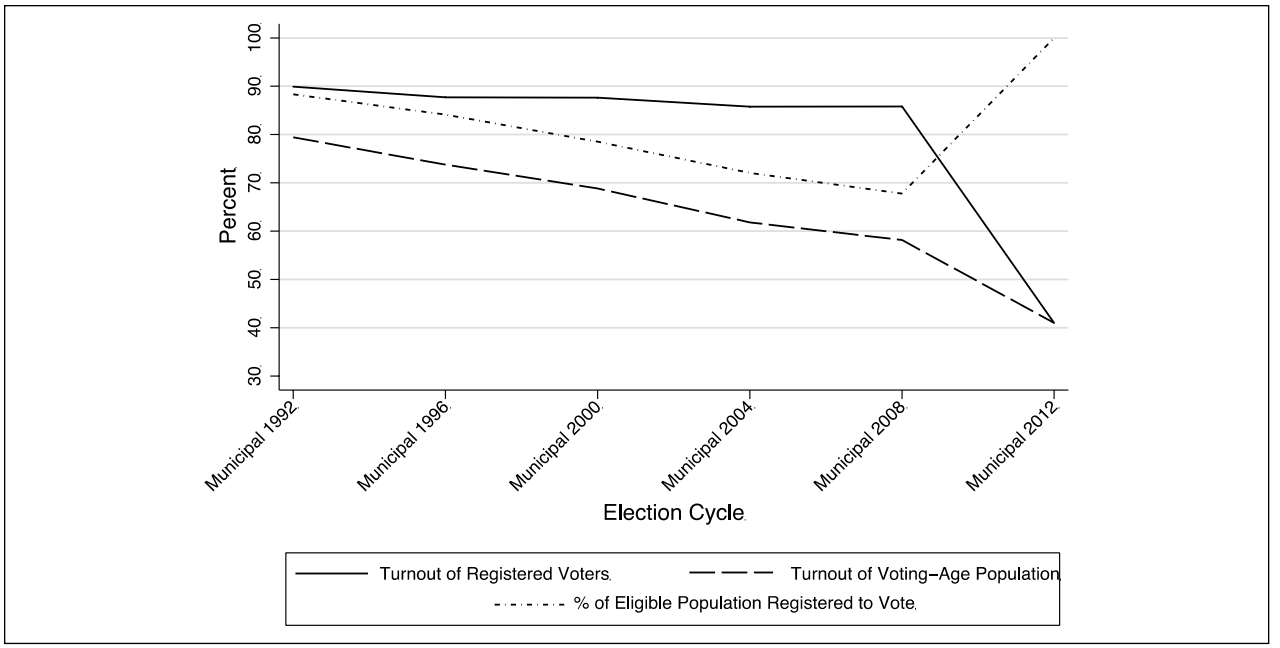

Figure 1. Electoral participation in Chile over time.
Source. Adapted from Barnes and Rangel (2014).

other institutions that vary across districts will work in conjunction with compulsory voting laws to structure political participation. In the next section, we discuss an election law reform in Chile and the subsequent changes in participation that help motivate this line of inquiry.

Chile's Compulsory Voting Reform

Prior to the restoration of Chile's democracy in 1989, Chile implemented a voting system that combined voluntary registration and compulsory voting.[2] Under this system, all Chileans over the age of 18 were eligible to register to vote. Whereas registration was voluntary, all registered voters were required by law to vote. Those who abstained had to provide a legitimate and documented excuse for not voting; otherwise, they could face sanctions such as fines and possible imprisonment (International Institute for Democracy and Electoral Assistance 2017).[3] Despite the inconveniences of voluntary registration (Vonnahme 2014), registration rates were initially high due to contention surrounding the democratic referendum, as both the Pinochet dictatorship and its democratic opponents marshaled their supporters to register for the referendum. These combined efforts resulted in a 92 percent registration rate in the 1988 national plebiscite (Huneeus 2005). Figure 1 shows that turnout in municipal elections (measured as a percentage of registered voters) remained notably high and constant across time, suggesting that an overwhelming majority of those registered to vote complied with the compulsory voting law.[4] Yet, registration rates and turnout as a percentage of the *voting-age* population (i.e., all individuals eligible to vote regardless of registration status) gradually declined over the course of the next two decades as fewer newly eligible voters registered to vote. This steady decline prompted the government to reform the system in 2011 (Barnes and Rangel 2014; Morgan and Meléndez 2016).

The reformed voting system combines automatic registration (i.e., the entire voting eligible population is automatically registered to vote) and voluntary voting. Despite abandoning compulsory voting, politicians claimed that automatic registration would be enough to spur higher turnout. President Piñera asserted that the municipal elections following the reform would report the highest turnout rates in history (Barnes and Rangel 2014). Yet, when the polls for the municipal elections closed on October 28, 2012, nationwide turnout was reported to be a mere 41 percent—a 17 percentage point decline from the previous municipal election and the lowest turnout on record since the restoration of democracy in Chile (Figure 1).

Although the decrease in national-level turnout was sizable, district-level data from Chile's 345 municipalities tell a different story: the average district-level turnout was 57.49 percent in 2008 and 54.64 percent in 2012—an average decrease of only 2.85 percent. This divergence between the average national-level decline in turnout and the average district-level decline is due to the fact that the district-level average is not weighted by district population: for the district-level statistic, an increase in turnout

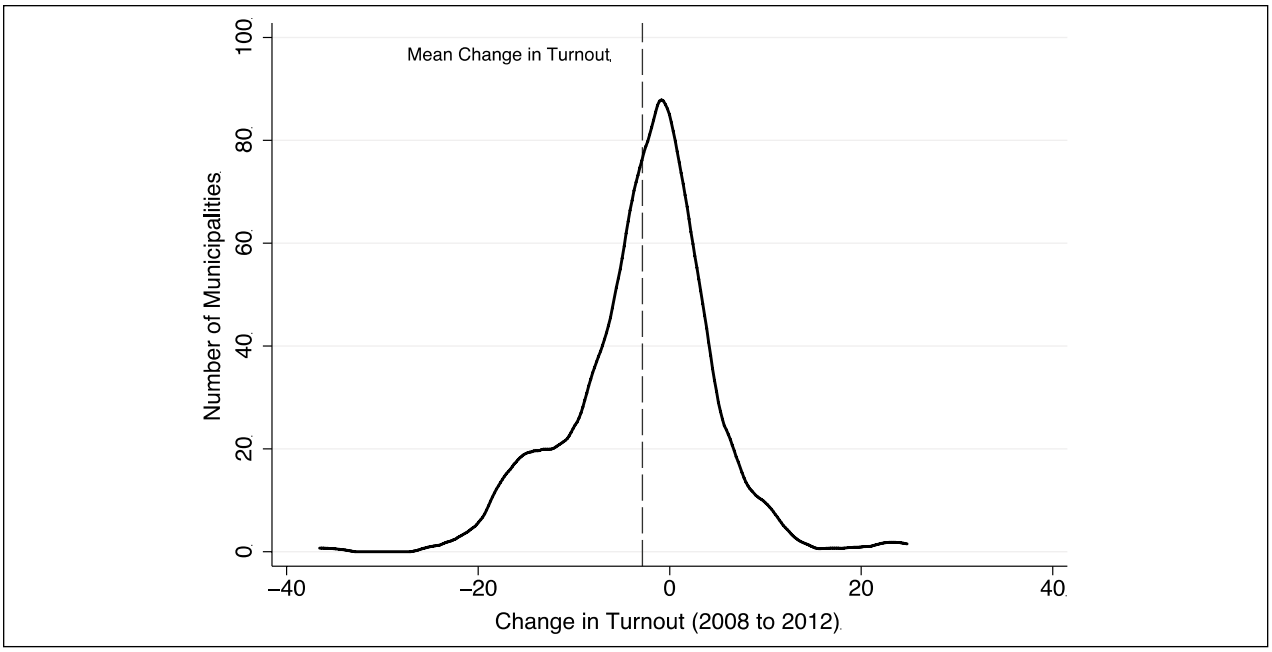

Figure 2. Distribution of the change in turnout between 2008 and 2012.
Turnout measured as a percentage of voting-age population in a given municipality.

in a small district is weighted the same as a decrease in a large district. But, for the national-level statistic, turnout in a large district is weighted much more heavily than turnout in a small district. The data also indicate that there is considerable variation in the change in turnout from 2008 to 2012 across Chile's municipalities, as illustrated in Figure 2. For example, turnout decreased by more than 20 percent in 55 districts, but actually increased in 119 districts once compulsory voting was abolished.

If compulsory voting is one of the strongest predictors of turnout, then we should expect turnout to decline in all districts, given that the same electoral reform was implemented in every district. Yet, the large variation in the change in turnout across districts suggests that district-level turnout is motivated by other political and institutional factors in the absence of compulsory voting. In the next section, we develop expectations as to how mobilizing institutions—such as district size, electoral competition, and candidate fragmentation—motivate participation conditional on compulsory or voluntary voting.

The Conditional Impact of Mobilizing Institutions

In addition to compulsory voting, other political institutions are major determinants of electoral participation. Institutions determine whose views get represented and how individuals can work within the electoral system to voice their concerns. When individuals perceive their vote to be important and influential in the electoral process, they are encouraged to participate in elections. This is because citizens are more likely to vote when they believe their vote has a higher chance to influence the electoral outcome (Levine and Palfrey 2007; Riker and Ordeshook 1968). As a result, institutions that increase the perceived value of an individual's vote should mobilize electoral participation. By contrast, when voters do not perceive their vote as having the potential to influence electoral outcomes, participation rates are likely to be low (Downs 1957).

We argue that the impact of mobilizing institutions should be conditional on the presence of voluntary voting. Although it is reasonable to expect that mobilizing institutions may make the appeal of voting stronger or weaker in some districts, we should not expect these institutions to exert a strong influence on voter turnout under compulsory voting. Assuming that compulsory voting laws are enforced and the costs associated with abstaining are sufficient to compel people to the ballot box, there is less variation across districts in the risks and costs associated with abstention.[5] Given this, the effect of other institutions on turnout is likely squelched when voting is mandatory, rendering mobilizing institutions weak predictors of turnout.[6] But, under voluntary voting, where voters have the option to abstain and do not incur sanctions for doing so, mobilizing institutions are key for voter mobilization.

Whereas mobilizing institutions are likely weak predictors of turnout under compulsory voting, they can help us understand *how votes are cast* among those who turned out.

That is, given that voting blank or null at the polls is often considered a form of abstention when voting is mandatory (Power and Garand 2007; Power and Roberts 1995), we should expect the patterns of *invalid voting* under mandatory voting to be similar to patterns of *abstention* under voluntary voting. Specifically, we argue that mobilizing institutions discourage *invalid voting* (thus compelling voters to cast a valid vote). Thus, although mobilizing institutions are less likely to impact the overall level of turnout under compulsory voting, they are likely to increase *effective* turnout—that is, the likelihood that individuals cast a valid vote, and consequently register a preference at the polls.

In voluntary systems, we expect the relationship between mobilizing institutions and invalid voting to be weaker than in compulsory systems. When voting is voluntary, voters who do not perceive their vote as potentially decisive are likely to abstain altogether rather than voluntarily turning out and casting an invalid vote. That said, some individuals also use invalid voting as a form of protest—that is, some people may voluntarily turn out and cast a blank vote or nullify their ballot to demonstrate their dissatisfaction with the system (Uggla 2008). Thus, we should observe a negative relationship between mobilizing institutions and invalid voting even under voluntary voting, but this relationship should be weaker than under compulsory voting.

Although a number of political institutions have been shown to influence turnout (such as concurrent elections and efficient voter registration), our theory focuses on those institutions that increase turnout by affecting the likelihood that individuals will perceive that their vote can make a difference. For instance, although concurrent elections are shown to increase turnout in down ballot races (Hajnal and Lewis 2003), we would not expect concurrent elections to change the probability that individuals cast a *valid* vote in down ballot elections. Similarly, more efficient registration requirements may increase overall turnout (Vonnahme 2014), but should not structure how people cast their ballots when they vote (e.g., valid vs. invalid voting). Therefore, we consider three key mobilizing institutions that directly influence how valuable citizens perceive their vote to be: district size, electoral competition, and candidate fragmentation.[7] These institutions are also of particular interest in the case of Chile, where mayoral elections vary primarily along these three dimensions and other electoral institutions are held constant across municipalities. Accordingly, we develop explicit hypotheses for how these specific mobilizing institutions influence electoral participation, conditional on compulsory and voluntary voting.

District Size

The size of an electoral district's population can influence the perceived value of an individual vote (Geys 2006). In districts with smaller populations, each vote has more influence on the election outcome, leading voters to perceive there to be a higher probability that their vote will make a difference (Downs 1957; Levine and Palfrey 2007; Riker and Ordeshook 1968). As district size increases, the perception that an individual could cast the deciding vote decreases, thereby discouraging participation. Electoral participation should, however, manifest differently under voluntary and compulsory voting. Smaller electoral districts should be associated with higher *turnout* when voting is voluntary. In compulsory systems, although the social costs associated with abstentions may be higher in smaller districts than in larger districts, district size should have a much weaker impact on turnout given that voters in all districts do not have the option to abstain.[8] We also expect levels of invalid voting to be relatively low when district sizes are small and an individual believes that their vote can make a difference. This should be the case especially under compulsory voting, where invalid voting can be considered a form of abstention. We thus hypothesize the following:

District Size-Turnout Hypothesis: Conditional on voluntary voting, as the size of a given district increases, turnout in the district decreases.
District Size-Invalid Vote Hypothesis: The positive relationship between district size and invalid voting should be stronger under compulsory voting than under voluntary voting.

Electoral Competition

Electoral competition can directly alter the perceived value of a vote (Cancela and Geys 2016). When the election is competitive, voters are more likely to think their vote could change the outcome, encouraging participation (Blais and Dobrzynska 1998; Engstrom 2012). When the election appears to be a foregone conclusion and a single vote likely has no bearing on the outcome, voters are discouraged from participating. We expect electoral competition to have a direct positive effect on turnout under voluntary voting. Under compulsory voting, higher levels of competition should not have a strong influence on turnout, but instead are more likely to impel voters to cast fewer invalid votes. We hypothesize the following:

Competition-Turnout Hypothesis: Conditional on voluntary voting, as competition in a given district increases, turnout in the district increases.
Competition-Invalid Vote Hypothesis: The negative relationship between competition and invalid voting should be stronger under compulsory voting than under voluntary voting.

Candidate Fragmentation

The perceived value of a vote also varies based on the number of viable candidates who compete in an election (what is typically referred to as candidate fragmentation). On the one hand, when elections have a large number of viable candidates, it may be difficult for voters to distinguish between the top two front-runners, raising uncertainty as to how their vote will influence the electoral outcomes, thus discouraging participation (Cox 1997). On the other hand, some scholars argue that higher candidate fragmentation makes electoral competition more meaningful and motivates voters to perceive that their vote will make a difference (Blais and Carty 1990; Seidle and Miller 1976). Consequently, we expect that the relationship between candidate fragmentation and turnout should be an inverted U-shape (Blais and Dobrzynska 1998; Jackman 1987), in that both a low and high number of effective candidates discourage participation. Candidate fragmentation is most likely to promote participation at moderate levels (Blais and Carty 1990). In terms of turnout, we expect to observe this inverted U-shaped relationship particularly when voting is voluntary. Under compulsory voting, we expect low and high levels of candidate fragmentation to promote higher rates of invalid voting, while moderate levels of fragmentation should discourage the casting of an invalid vote. Two fragmentation hypotheses follow:

Fragmentation-Turnout Hypothesis: Conditional on voluntary voting, there will be an inverse U-shaped relationship between candidate fragmentation and district-level turnout.

Fragmentation-Invalid Vote Hypothesis: The U-shaped relationship between candidate fragmentation and invalid voting should be stronger under compulsory voting than under voluntary voting.

Leveraging Subnational Variation: A Municipal Research Design

We examine electoral participation in the 2004 and 2008 Chilean mayoral elections that took place prior to the change in the voting system, and the 2012 municipal elections directly following the reform. This subnational design has multiple advantages. First, the subnational setting provides us with the opportunity to examine participation across a much larger number of cases—that vary on a number of important dimensions—than would be available in a cross-national analysis (Barnes 2016; Holman 2013, 2014; Vonnahme 2012, 2014). We examine participation in 345 municipalities, which is more than three times the number of countries that are examined in even the largest cross-national analysis.

Second, most cross-national analyses of national-level turnout use aggregate data. For example, cross-national research typically uses the average level of electoral competition rather than taking into account how competition varies across districts within the same country. This approach may obfuscate the effects of variables that vary at the district level. Our analyses do not require us to average across units, enabling us to more accurately assess the relationship between mobilizing institutions and electoral participation.

Third, the subnational analysis allows us to hold many contextual, historical, political, and cultural variables that are known to influence turnout—but extremely difficult to measure—constant. In Chilean municipal elections, mayors are elected using a plurality rule for four-year terms, without term limits (Hinojosa and Franceschet 2012). Elections are never held concurrently with national elections but are always concurrent with city council elections. During the period under study, two stable and cohesive electoral coalitions facilitate electoral coordination among the parties in their coalition prior to subnational elections and compete in subnational elections nationwide. This continuity across municipalities and over time allows us to isolate the effect of the change in the voting laws.

Beyond these research design advantages, understanding turnout in mayoral elections—and thus, whose interests are represented in the local policy-making process—is extremely important. Mayors are often responsible for developing and overseeing the implementation of local policies, such as public goods provisions and social welfare programs, that have a profound influence on citizens' daily lives (Hinojosa 2012; Holman 2013, 2014). Mayoral races are also politically relevant in Chile. Not only does the mayoral post constitute an important stepping-stone that politicians use to launch their political careers (Hinojosa 2012; Shair-Rosenfield and Hinojosa 2014), but also many Chilean mayors are seen as important national political leaders (Hinojosa 2009).

Data and Method

Our unit of analysis is the electoral district (in this case the municipality or "comuna"). We analyze two sets of dependent variables: (1) turnout and (2) invalid votes. We measure *turnout* using the total number of votes cast in a given election in an electoral district divided by the voting-age population for that district.[9] Although under the previous system voting was compulsory only for those registered, we calculate *turnout* as a percentage of the entire voting-age population (not just those who are registered). Turnout represents simply going to the polls, regardless of how voters decide to cast their votes (i.e., valid or invalid) once they are there. The data were collected from the Chilean Electoral Service.[10]

To measure *invalid voting*, we calculate both the percentage of *blank* votes as a share of all votes cast and the percentage of *null* votes as a share of all votes cast. Although it is uncommon for scholars to distinguish between blank and null votes (Power and Roberts 1995; Uggla 2008), some have contended that there are important theoretical reasons to conceptualize them as distinct (Driscoll and Nelson 2014). Kouba and Lysek (2016) note that the legal reasons for nullifying a valid or blank ballot might differ among countries; so when possible, it is important to consider the context of the country. In Chile, the electoral commission distinguishes between blank votes and null votes. Null votes are those where either (1) more than one candidate has been selected, or (2) any additional markings or drawings are identified on the ballot. Blank votes are those where there is (1) absolutely no indication of a single selection and (2) no additional markings are identified on the ballot.[11] In the case of Chile then, it is more likely that blank votes represent an intentional decision to abstain, whereas null votes are more likely to be the result of an unintentional error.[12] If blank votes are more akin to abstentions in Chile, mobilizing institutions should influence patterns of *blank* voting under compulsory voting. Nonetheless, we cannot rule out the possibility that null votes are sometimes used as protest votes (Driscoll and Nelson 2014). Thus, we consider both types of votes separately in our analyses. Table A1 in the online appendix includes the descriptive statistics for the three dependent variables along with all other variables used in this study.

Independent Variables

To test our hypotheses, we include a dummy variable for *Voluntary Voting*, coded 0 for elections that took place in 2004 and 2008 under the compulsory system and 1 for elections that took place in 2012 under the voluntary system. Second, we include a measure of *district size* and an interaction term between district size and voluntary voting to test the District Size Hypotheses. We measure *district size* using the log of the voting eligible population per district, measured in hundred thousands. District size ranges from 486 to 334,943, with a mean of 38,859. Third, to test the Competition Hypotheses, we measure *electoral competition* as the difference in vote share between the highest vote winner in the election and the second highest vote winner (Engstrom 2012). We also include the *electoral competition* measure and an interaction term between district competition and voluntary voting. We reverse the direction of the variable to facilitate the interpretation of our results so that higher values equate to more competitive elections. Electoral competition ranges from 0 to 1 with a mean of 0.83.

Fourth, we create a measure for candidate fragmentation. The number of candidates running for mayor in a given municipality ranges from 1 to 9 with an average of 3.9. Although the mayoral ballot is highly populated, not all of the candidates competing in the election are viable candidates. To account for this, we employ a measure of candidate fragmentation that discounts the effects of non-viable candidates who win only a nominal proportion of votes (Herrnson and Gimpel 1995; Rae and Taylor 1970).[13] *Candidate Fragmentation* is calculated as one minus the sum of squared vote shares. Elections with multiple highly competitive candidates have higher fragmentation scores, and those featuring one dominant candidate and several less competitive candidates have low fragmentation scores. As before, we include an interaction term between fragmentation and voluntary voting to test the Fragmentation Hypotheses.

Control Variables

In addition to our core set of explanatory variables, research suggests several factors may influence turnout (Cancela and Geys 2006; Power and Garand 2007). Specifically, we control for *open seat* elections (using a dummy variable), which spur more competition than incumbent races; the proportion of the municipal population that lives in an urban area; and *campaign spending* (measured in thousands) per capita at the municipal level.[14] We also control for *district magnitude*. Magnitude does not vary across districts for mayoral elections; it does, however, vary for city council elections, which are held concurrently and therefore could potentially affect turnout (Blais and Carty 1990). Next, if the voting system reform was motivated by political factors, there may be reason to suspect electoral participation would be systematically higher or lower in districts where parties in the political coalition responsible for the reform (i.e., the center-right coalition *Alianza*) hold the mayoral post. We include two dummy variables (*Alianza* and *Concertación*) to control for the political affiliation of the incumbent. Finally, we control for *previous voter turnout*, calculated as a percentage of the voting-age population.

Estimation Technique

Given that our dependent variables are bounded between 0 and 1, ordinary least squares (OLS) regression is technically inappropriate to test our hypotheses. To account for the bounded nature of the dependent variables, we estimate generalized linear models with a binomial distribution (i.e., a discrete probability distribution of the number of successes) and a logistic link function.[15] We use clustered standard errors (on municipalities) to account for the correlation between observations in the same municipality.[16]

Table 1. Voter Turnout and Invalid Voting.

	(1) Turnout	(2) Blank	(3) Null	(4) Turnout	(5) Blank	(6) Null
	2008–2012			2004–2012		
Voluntary Voting	−0.485	−1.031*	−1.273*	−0.433	−1.435*	−1.727*
	(0.277)	(0.365)	(0.551)	(0.304)	(0.369)	(0.507)
District Size	−0.022	0.252*	0.281*	−0.058*	0.269*	0.296*
	(0.020)	(0.034)	(0.028)	(0.015)	(0.031)	(0.026)
District Size × Voluntary Voting	−0.116*	−0.068*	−0.107*	−0.095*	−0.078*	−0.104*
	(0.018)	(0.019)	(0.021)	(0.017)	(0.018)	(0.019)
Electoral Competition	−0.068	−0.241	−0.207	−0.050	−0.172	−0.166
	(0.077)	(0.164)	(0.189)	(0.070)	(0.130)	(0.160)
Electoral Competition × Voluntary Voting	0.621*	−0.351	−0.896*	0.604*	−0.424	−0.945*
	(0.174)	(0.229)	(0.268)	(0.177)	(0.233)	(0.256)
Candidate Fragmentation	0.340	−6.562*	−5.574*	0.352	−8.317*	−7.691*
	(0.414)	(0.675)	(1.585)	(0.550)	(0.657)	(1.249)
Candidate Fragmentation × Voluntary Voting	−0.668	1.727	3.277	−0.685	3.504*	5.388*
	(1.195)	(1.495)	(2.227)	(1.233)	(1.586)	(2.060)
Candidate Fragmentation^2	−0.224	5.304*	4.801*	−0.225	6.949*	6.877*
	(0.337)	(0.576)	(1.321)	(0.457)	(0.571)	(1.034)
Candidate Fragmentation^2 × Voluntary Voting	−0.079	−0.642	−1.921	−0.060	−2.295	−3.991*
	(1.000)	(1.307)	(1.883)	(1.022)	(1.378)	(1.738)
Campaign Spending	0.078*	−0.068*	−0.044	0.056*	−0.058*	−0.014
	(0.016)	(0.028)	(0.032)	(0.010)	(0.019)	(0.019)
Percent Urban	−0.016	−0.397*	0.363*	−0.040	−0.366*	0.348*
	(0.036)	(0.092)	(0.088)	(0.036)	(0.087)	(0.081)
Open Seat	0.011	0.033	−0.021	0.032	0.020	−0.006
	(0.023)	(0.047)	(0.048)	(0.026)	(0.043)	(0.044)
District Magnitude	−0.023	−0.067*	0.017	−0.006	−0.081*	0.008
	(0.013)	(0.024)	(0.020)	(0.009)	(0.022)	(0.019)
Alianza Incumbent	0.005	0.042	−0.056	0.017	0.045	−0.035
	(0.021)	(0.050)	(0.050)	(0.020)	(0.047)	(0.050)
Concertación Incumbent	−0.009	0.060	−0.019	0.002	0.059	−0.008
	(0.020)	(0.041)	(0.045)	(0.019)	(0.040)	(0.045)
Previous Turnout	3.276*			3.258*		
	(0.148)			(0.151)		
Constant	−1.600*	−0.427	−1.364*	−1.733*	0.042	−0.869*
	(0.194)	(0.346)	(0.448)	(0.191)	(0.293)	(0.392)
Observations	687	689	689	1027	1034	1034
Log pseudo likelihood	−301.38	−51.88	−67.79	−452.45	−83.29	−108.51

Standard errors in parentheses.
*$p < .05$.

We use two different samples of elections in the manuscript and an additional sample in the online appendix. Our main analyses presented in models 1 to 3 of Table 1 are based on a sample that includes data from the 2008 and 2012 municipal elections—the elections immediately before and after the electoral reform. Chile has 345 municipalities for each of these time periods. Although this would bring the number of observations to 690, there are three instances of municipalities that were dropped due to reporting irregularities, bringing our total number of observations to 687 (689 for the invalid votes models).[17] In a secondary analysis presented in models 4 to 6 of Table 1, we expand our sample to include all elections where mayors were directly elected (i.e., mayoral elections from 2004, 2008, and 2012). Finally, in Table B2 and Figures B4 to B6 of the online appendix, we expand the sample to include electoral results from 1996 to 2012 to demonstrate the consistency of our main findings even when we include electoral results from the period when mayors were not directly elected (i.e., municipal elections in 1996 and 2000).[18]

Empirical Results

We examine the impact of mobilizing institutions on participation under compulsory and voluntary voting in

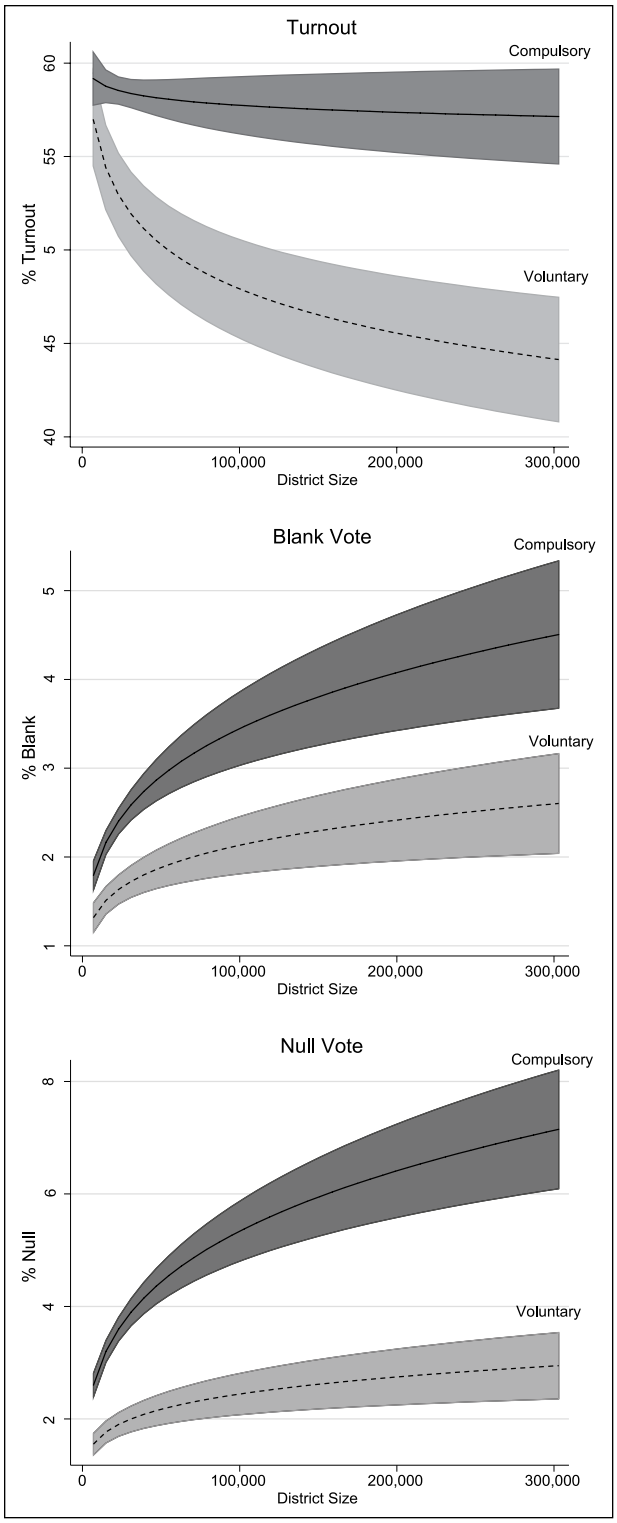

Figure 3. District size.

Table 1. To facilitate the interpretation of the results, we graph the results for each of our hypotheses in Figures 3 through 5. We plot expected values of the level of turnout and invalid votes (surrounded by 95 percent confidence intervals) for the average district across different values of interest while all other variables are held constant at their mean/mode.[19] We discuss the results of each of our hypotheses in turn.

Evaluating the District Size Hypotheses

The top panel of Figure 3 graphs expected values of turnout on the *y*-axis as district size increases on the *x*-axis. This figure demonstrates that as the district population increases, turnout remains essentially flat under compulsory voting, but decreases rapidly under voluntary voting, providing support for our District Size-Turnout Hypothesis. The relationship between district size and turnout under voluntary voting is stronger for small districts but has diminishing effects across larger districts. This finding supports our expectations that in small districts, turnout will be higher because citizens perceive their vote to be important. For instance, when looking at the data, the level of turnout under voluntary voting is *higher* than under compulsory voting in districts with fewer than 1,000 people (i.e., eight districts). In those districts, average turnout was 76.6 percent in 2008 under compulsory voting, and 79.4 percent in 2012 under voluntary voting (compared with the nationwide turnout of 55 percent). Following the reform, turnout increased in all but one of these districts—providing strong face validity to our results.

Next, the bottom two panels in Figure 3 plot the expected percentage of blank and null votes on the *y*-axes as district size increases across the *x*-axes. The relationship between district size and invalid votes is positive and statistically significant under compulsory voting, as both figures show similar patterns. Our results predict that in a district with 10,000 registered voters, for example, only 1.96 percent of votes will be blank, and 2.87 percent will be null. But, the percentage of blank and null votes both increase by more than seventy-five percent in districts with 100,000 registered voters. Under voluntary voting, there is a slight increase in the percentage of blank and null votes when we move between extremely small districts, but the increase is much smaller than that observed under compulsory voting. Overall, results shown in Figure 3 are consistent with our expectations—the positive and significant trend between invalid votes and district size under compulsory voting suggests that district size influences *the way* people vote when voting is mandatory, but not the rate in which people turn out to the polls.

Evaluating the Competition Hypotheses

In Figure 4, we graph the relationship between electoral competition on the *x*-axis and turnout on the *y*-axis in the top panel. Under compulsory voting, the expected level of turnout remains constant as competition increases—that is to say, electoral competition has no discernible impact on

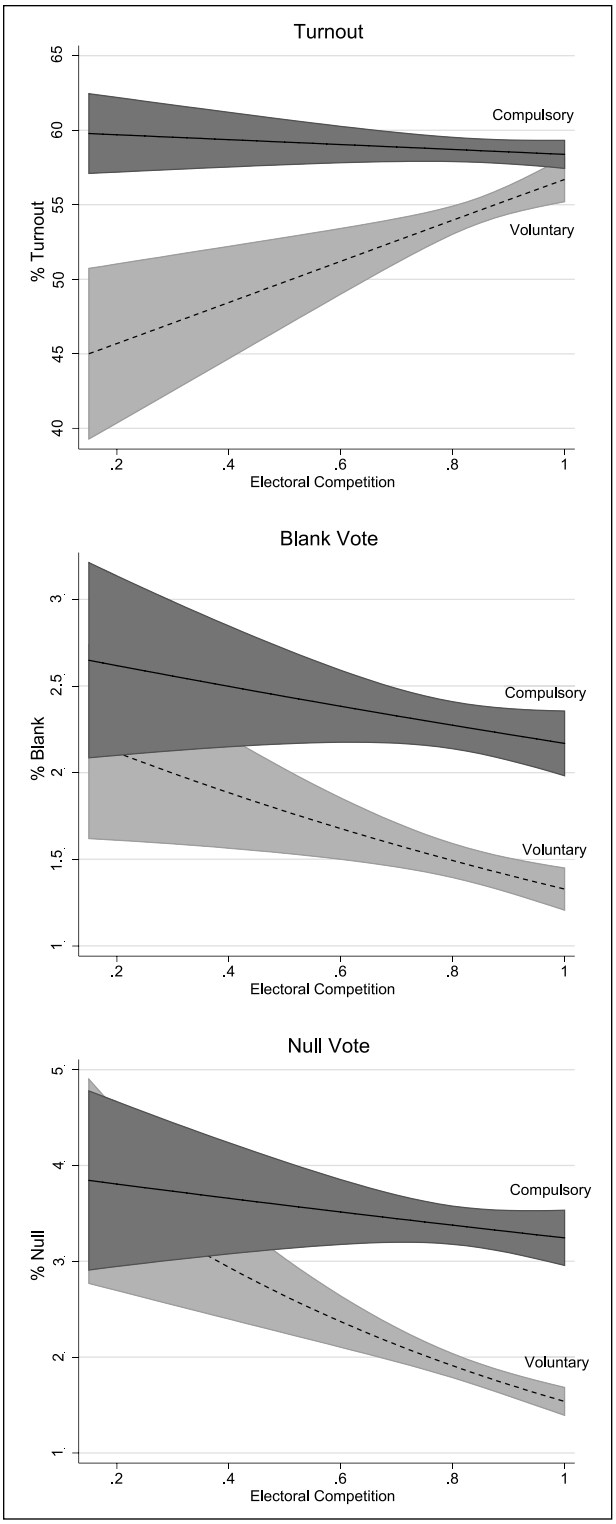

Figure 4. Electoral competition.

turnout when voting is obligatory.[20] Although previous research argues that competition is a "cornerstone" of the turnout model and is consistently found to have a positive relationship with turnout (Geys 2006), we find that competition has a negligible impact when voting is compulsory. Under voluntary voting, by comparison, the relationship is positive and significant, indicating that as electoral competition increases, turnout increases as well (offering strong support for the Competition-Turnout Hypothesis).

Although on average turnout is higher under compulsory voting than under voluntary voting, when competition is at its highest, the turnout gap disappears. When the top candidate wins by a ten-point margin or less (.9 or above in the competition measure ranging from 0 to 1), the expected level of turnout is essentially the same under both compulsory and voluntary voting. A closer look at the data shows that in districts in our sample where a candidate won by less than a ten-point margin (i.e., when competition is high), district-level turnout averaged 58 percent under compulsory voting and 57 percent under voluntary voting—a mere 1 percent difference that does not attain statistical significance ($p = .321$; two-tailed t test based on 139 municipalities in 2008 and 125 municipalities in 2012). By contrast, significant differences emerge when competition is low—in districts where candidates won by more than a ten-point margin, district level turnout averaged 57 percent under compulsory voting but only 53 percent under voluntary voting. This represents a statistically significant difference of 5 percent in the average district level turnout ($p < .001$; two-tailed t test based on 206 municipalities in 2008 and 220 municipalities in 2012).

Turning to invalid votes, Figure 4 shows that for both blank and null voting, the probability of casting an invalid vote decreases as competition intensifies under both voluntary and compulsory voting systems. Specifically, as we move from a district with low levels of electoral competition (i.e., 0.15) to districts with high levels of competition (0.95), the expected levels of blank votes and null votes decrease by 37.2 percent and 57.7 percent, respectively, in districts with voluntary voting and by 17.1 percent and 14.7 percent, respectively, in districts with compulsory voting. These findings show that as the level of electoral competition intensifies, the rate of blank and null votes declines. But, in contrast to our expectations (see the "Discussion" section), the relationship is stronger under voluntary voting than under compulsory voting.

Evaluating the Fragmentation Hypotheses

In regard to candidate fragmentation, the top panel of Figure 5 depicts the relationship between fragmentation on the x-axis and turnout on the y-axis. This figure shows that at low levels of fragmentation (i.e., between 0 and .4), the expected level of turnout is the same under compulsory and voluntary voting. To put this finding in context, a value of .4 typically indicates there are two strong

candidates but one has a solid advantage. A value of .5 typically indicates there are two highly competitive candidates. As fragmentation increases from .4 to .5, the expected level of turnout between compulsory and voluntary systems becomes significantly different. The expected values indicate that higher levels of fragmentation result in lower turnout under voluntary voting. In other words, when districts display a larger number of equally competitive candidates—making it difficult to distinguish between candidates' likelihood of winning—turnout decreases. Turnout, however, does not change based on levels of fragmentation under compulsory voting. This provides partial support for the Fragmentation-Turnout Hypothesis. As expected, we see that high levels of fragmentation result in lower levels of turnout under voluntary voting. But, low levels of fragmentation do not necessarily deter turnout.

For the Fragmentation-Invalid Vote Hypothesis, we posited a U-shaped relationship between candidate fragmentation and the level of invalid votes, particularly when voting is compulsory. We find support for this hypothesis. The bottom two graphs in Figure 5 illustrate that under compulsory voting, when fragmentation is low, blank and null voting are at their highest: when fragmentation is at .2 (indicating that there is only one viable candidate), our model predicts that 5.18 percent of voters will cast a blank vote and 6.2 percent will cast a null vote. As fragmentation increases, the expected percentage of blank and null declines, reaching a low of 2.1 percent of blank votes and 3.2 percent of null votes when fragmentation is about .6 (indicating competition is high but voters can also distinguish between candidates). As the level of fragmentation moves to the upper range in the data, and it becomes increasingly difficult to distinguish between candidates, the expected percentage of blank and null votes increases again, albeit slightly. The results indicate that under compulsory systems, effective participation thrives (i.e., abstention in the form of invalid voting declines) when fragmentation is moderate and voters can more clearly distinguish between viable candidates.

Our model indicates that under voluntary voting, the relationship between fragmentation and blank votes is not statistically significant. The flat line in the middle panel of Figure 5 indicates that fragmentation does not exert a substantive impact on blank voting under the voluntary system. There is, however, a slight positive relationship between fragmentation and the level of null votes. Overall, the bottom two panels of Figure 5 depict the conditional nature of the relationship between fragmentation and blank voting. This result provides support for our expectation that there will be a U-shaped relationship between fragmentation and blank voting, and that this relationship would be much stronger under compulsory voting than under voluntary voting.

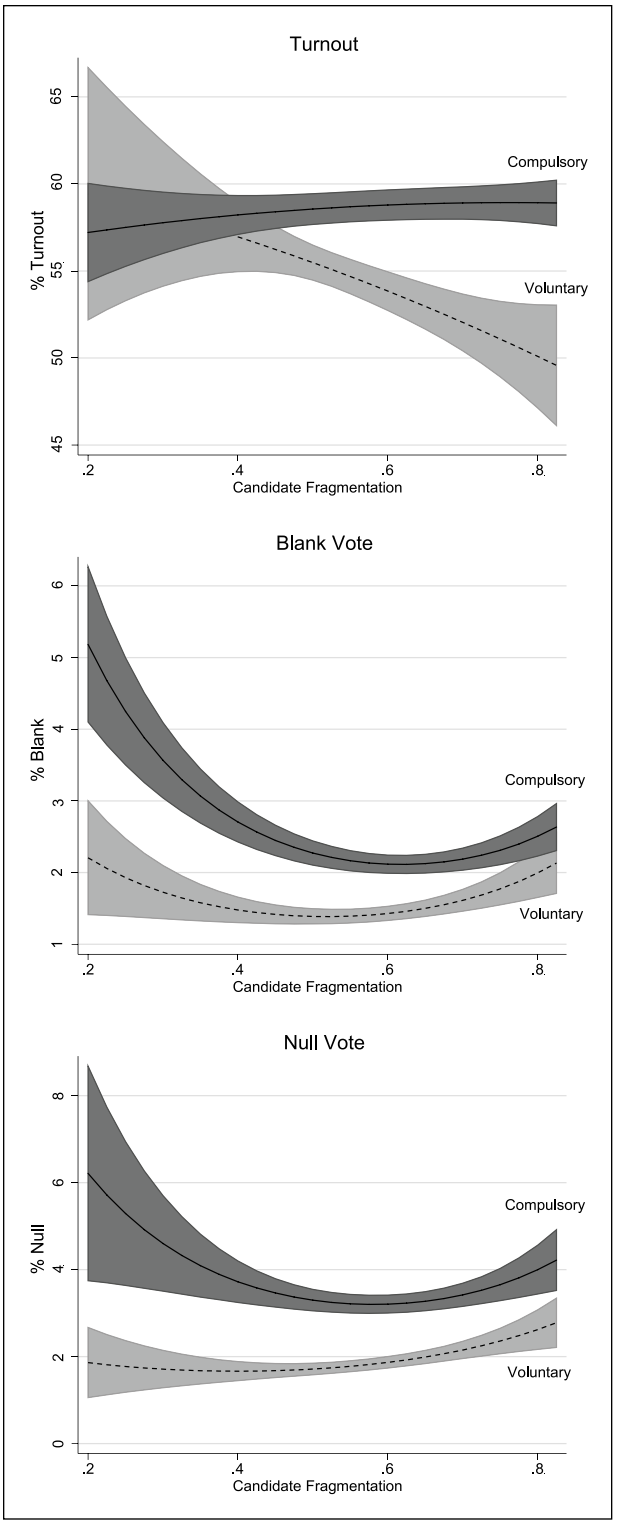

Figure 5. Candidate fragmentation.

Discussion

Our results indicate that electoral participation will be strongest when (1) citizens live in districts that are small enough that they anticipate their vote could make a

difference, (2) there is a competitive electoral climate, and (3) candidate fragmentation is sufficiently constrained such that voters can easily distinguish between viable alternatives. Where mobilizing institutions are most effective at highlighting the value of an individual vote, they promote high levels of participation, similar to those manufactured by compulsory voting. Beyond these main findings, three interesting patterns merit further discussion.

First, the overall level of invalid voting under compulsory voting is significantly higher than levels under voluntary voting, suggesting that some people do use invalid voting as a form of abstention when turnout is mandatory. Our findings demonstrate that when voting is compulsory, mobilizing institutions promote *effective* turnout by encouraging voters to cast a valid vote. That said, this relationship is weaker than we anticipated. This suggests that invalid voting under compulsory systems is not entirely equivalent to absenteeism in voluntary systems. Instead, consistent with the argument that compulsory voting promotes political engagement via a sunk cost effect (Córdova and Rangel 2017; Shineman 2018), our results suggests that having sunk the cost of going to the polls, voters are more likely to cast a valid vote than an invalid vote, even in the absence of mobilizing institutions. To this end, the combined insights from our findings and sunk costs research suggest there may be important variation in the types of voters who cast a valid vote. This is because in the context of compulsory voting, sunk costs are more likely to spur political engagement among politically marginalized groups (Córdova and Rangel 2017). Consequently, our research implies that when voting is mandatory, members of marginalized groups—having sunk the cost of turning out—may be more likely to cast a valid vote even when district size is large, competition is low, and candidate fragmentation is moderate.

Second, although we expect the relationship between mobilizing institutions and invalid voting to be stronger under compulsory voting, we still observe some significant relationships when turnout is voluntary. This relationship suggests that invalid votes are not simply a tool for abstaining under compulsory voting, but are also used to convey meaningful political expression even when citizens are not required to turn out to vote. For instance, our models predict levels of invalid votes to be higher when elections are noncompetitive under voluntary voting. This finding suggests that voters who are dissatisfied with the election—for example, with the only competitive candidate or with an electoral system that does not promote electoral competition—are paying the costs of turning out and then casting an invalid vote to signal their dissatisfaction. Similarly, higher levels of invalid voting in large districts could suggest individuals' recognition that their vote does not matter. These results contribute important insights to research aimed at understanding the causes and implications of invalid voting around the world (Driscoll and Nelson 2014; Katz and Levin, forthcoming).

Finally, when considering the generalizability of our results, it is important to consider the Chilean context. As we noted above, Chile's former compulsory voting system was unique in combining mandatory voting with voluntary registration. Although registration rates were extremely high immediately following the transition to democracy, high levels of voter registration were not sustained over the next two decades. This means that during the prereform period, turnout was likely lower in Chile than in other countries where compulsory voting is combined with automatic registration. Thus, in other countries, mobilizing institutions may not be entirely sufficient to completely close the turnout gap between voluntary and compulsory systems that employ automatic registration—particularly in municipal elections. Turnout in presidential elections held in systems with voluntary voting may be higher than the level of turnout observed here. More research is needed to understand the extent to which institutional design can diminish the turnout gap between systems with and without compulsory voting. Nonetheless, what is clear is that mobilizing institutions go a long way toward promoting electoral participation.

Conclusion

Leveraging subnational variation, we demonstrate that compulsory voting promotes high rates of turnout even in contexts where people have very little motivation to show up at the polls (i.e., large district size, low competition, and a high number of candidates). The fact that turnout is remarkably constant across different levels of mobilizing institutions clearly demonstrates the ability of institutional features to structure political outcomes. Beyond reinforcing the belief that compulsory voting is one of the most powerful mobilizers of voter turnout, our findings have major implications for electoral participation and institutional design.

In regard to electoral participation, approaching participation as a broader concept allows us to shed light on how institutions interact to influence both turnout and voting behavior at the polls. Although mobilizing institutions exert little influence on turnout when voting is mandatory, we show that when the institutional context elevates the importance of an individual's vote, participation rates under voluntary voting increase substantially. At the same time, mobilizing institutions are important for explaining *effective* turnout under compulsory voting. Even though, on average, rates of invalid voting are higher under compulsory than voluntary voting, mobilizing institutions diminish this relationship by encouraging the casting of valid votes. Thus, whereas mandatory

voting increases overall turnout substantially, mobilizing institutions promote *meaningful turnout*—encouraging voters to register their preference at the polls by casting a valid vote.

With respect to institutional design, the findings from our research imply that characteristics associated with competitive, participatory democracies are effective for *organically* stimulating political participation. That said, given the rarity of such superb democratic conditions, it seems the message for electoral engineers and governments looking to achieve high electoral participation is to combine compulsory voting—an effective tool for *manufacturing* turnout—with mobilizing institutions, which maximize *effective* political participation.

In closing, our research raises questions for future consideration. Although our theory is general, our empirical analysis focuses specifically on the impact of three political institutions that vary across the Chilean municipal elections. Future research should examine the conditional impact of other political institutions that are known to increase individuals' beliefs that their vote will make a difference (e.g., district magnitude and proportional representation). Finally, it is important to consider how mobilizing institutions and compulsory voting may differentially structure electoral engagement among unengaged portions of the population (Farris and Holman 2014; Holman 2016; Stein and Vonnahme 2008)—for example, urban and rural popular classes, indigenous communities, and young people—who are increasingly marginalized in Chilean politics (Morgan and Meléndez 2016).

Authors' Note

Earlier versions of this work were presented at the Annual Meeting of the Kentucky Political Science Association and the XI Congreso Nacional de Ciencia Política—Sociedad Argentina de Análisis Político.

Acknowledgments

The authors are grateful to Adam Auerbach, Emily Beaulieu, Jesse Johnson, Philippe LeMay-Boucher, Richard Matland, Justin Wedeking, the editors at *Political Research Quarterly*, and four anonymous reviewers for invaluable feedback on this research.

Data and Replication

The data and replication materials are available on the Harvard Dataverse Network at https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/CAIUUG&version=1.0

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Chile is one of only four countries including the Netherlands, Venezuela, and Italy to ever abandon compulsory voting (Barnes and Rangel 2014).
2. Although the existence of registration requirements under the old compulsory system was a unique characteristic of typical mandatory voting systems, Chile's electoral reform in combination with subnational elections offers a rare opportunity to evaluate the effect of institutions on participation conditional on the voting system. As we elaborate in the "Discussion" section, it is important to take into account Chile's unique registration requirements when interpreting our results.
3. Fines for abstention could amount to three *Unidad Tributaria Mensuales* [Monthly Tax Unit] (a measure created by the Chilean government for the payment of various types of fines that takes into account the inflation rate). Abstainers had to go in front of a local judge, who would then decide on the amount of the fine. In 2009, for example, fines could range anywhere from 18.500 to 110.000 Chilean pesos (approximately US$34–US$200) (Emol 2009). Valid excuses for abstaining without being subject to a fine included documented illness, being outside of the country, or being 200 km or more away from a polling station.
4. This is not the case in all countries with compulsory voting. Barnes and Rangel (2014), for instance, show that when compulsory voting is coupled with low or no enforcement mechanisms (e.g., Mexico or Costa Rica), recent turnout rates were more similar to those of countries where voting is voluntary.
5. As previously noted, in the case of Chile, compulsory voting laws were enforced. In the absence of enforcement mechanisms, we would likely expect more variation in participation across the different mobilizing institutions.
6. Although in theory mobilizing institutions could influence voluntary registration rates during the prereform era, changes in registration over time are not highly susceptible to fluctuations due to voter mobilization. This is because once registered, voters remained registered for all subsequent elections and were therefore always subject to the compulsory voting law. Thus, in practice, variation in mobilizing institutions is not driving up/depressing registration rates over time within individual municipalities. Indeed, our findings are robust to models that control for municipal-level registration rates (Online Appendix Table B4 and Figure B13).
7. Our logic should also apply to, for instance, proportional representation (PR), because in this case, PR systems do not simply encourage voters to show up to the polls but can also change the way people choose to cast their ballot (given that it has the potential to influence citizens' perceptions of the value of their vote). We do not elaborate on this particular institution because in the case of Chile, the electoral system does not vary in mayoral elections.

8. Individuals living in smaller districts are likely to feel more social pressure to comply with the law than those living in larger districts (Gerber, Green, and Larimer 2008)—where abstention may not be easily noticed—therefore causing turnout to vary even under compulsory voting. Still, our results show that predicted levels of turnout under compulsory voting are similar across all district sizes.
9. We use registration data from 2012 to approximate the voting-age population for each district. As registration was automatic in 2012, all voting-age citizens were included.
10. Available at https://www.servel.cl/estadisticas-2/.
11. See https://www.servel.cl/votaciones-y-escrutinios/.
12. A third source of invalid voting could be tabulation errors. Although we cannot account for tabulation errors in our analysis, Ansolabehere and Stewart (2005) provide evidence showing tabulation errors tend to be more likely in smaller districts. If this is the case, it would make it more difficult for us to find support for our district size hypothesis.
13. This is different from the electoral competition variable, which solely measures the vote gap between first and second place candidates. The two measures are correlated at 0.5734 in 2004, 0.5541 in 2008, and 0.5468 in 2012.
14. Available at https://www.servel.cl/gasto-electoral-4/.
15. In addition, our results are robust to Beta Maximum Likelihood Estimator (MLE) which assumes the data take on a beta distribution—a continuous probability distribution defined on the interval [0, 1] (Online Appendix Table B5 and Figures B14–B16). Our results are also robust to ordinary least squares (OLS; Online Appendix Table B1 and Figures B1–B3).
16. An additional concern is that given the compositional structure of the data, blank and null votes are not distributed independently of one another. As explained in the online appendix, our results are robust to alternative estimations that explicitly address these concerns (Table B3 and Figures B7–B9).
17. See Online Appendix A for discussion of the sample selection.
18. See Hinojosa and Franceschet (2012) for a detailed discussion of the change in election rules.
19. Expected values were calculated using models 1 to 3 in Table 1. Results are also consistent when graphing the expected values using models 4 to 6 (Figures B10–B12 in the online appendix). Open seat, Alianza incumbent, and Concertación incumbent are set to 0.
20. Given Chile's unique combination of voluntary registration with compulsory voting, one possibility is that electoral competition could compel citizens who were not previously registered to vote under the compulsory voting system, in which case turnout could vary even under compulsory voting (because by law, all registered voters are then required to turn out). This reasoning, however, would likely bias our results against our hypothesized relationships. In fact, even with the possibility that mobilizing institutions such as electoral competition might encourage registration under the voluntary registration component of Chile's law, we still find robust evidence that turnout varies little under compulsory voting. In addition, registration closed three months prior to the election, which makes it less likely that electoral competition or candidate fragmentation will mobilize registration this far in advance of a municipal election.

Supplemental Material

Supplemental materials for this article are available with the manuscript on the *Political Research Quarterly* (*PRQ*) website.

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