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Vote Choice in Complex Electoral Environments

A dissertation submitted in partial satisfaction of the
requirements for the degree
Doctor of Philosophy

in

Political Science

by

Saul Frederick Cunow

Committee in charge:

Professor Scott Desposato, Chair
Professor James Fowler
Professor Ayelet Gneezy
Professor Gary Jacobson
Professor Matthew Shugart

2014

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Chair

University of California, San Diego

2014

EPIGRAPH

“What does a Federal Deputy do? Actually, I don’t know. But if you vote for
me, I’ll tell you.” —Tiririca

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Chapter 3 has been submitted for publication in the *Journal of Experimental Political Science*. Chapter 4 has been submitted for publication in the *American Journal of Political Science*. The dissertation author was the primary investigator and author of both papers.

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ABSTRACT OF THE DISSERTATION

Vote Choice in Complex Electoral Environments

by

Saul Frederick Cunow

Doctor of Philosophy in Political Science

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Professor Scott Desposato, Chair

This dissertation addresses the effects of electoral complexity for voters and how voter responses to complexity affect the quality of representation. I identify a tradeoff between more representative elections and the cognitive burdens longer ballots create for voters. Chapter 1 provides the motivation for the project and highlights the role of choice set size in creating complexity for voters. Chapter 2 tests for a relationship between the number of candidates and participation rates in four Brazilian elections. In Chapter 3, I introduce an experimental approach to study the microfoundations of the effects of complexity on voters. Using a survey experiment that randomly varies ballot length and the presence of information about candidates' partisan affiliations, I find strong support for the relationship identified in Chapter 2. When presented with more candidates, many voters are

deterred from participating, with party labels facilitating participation but not mitigating the effects of choice set size. Chapter 4 turns to the consequences of complexity for voters' information acquisition strategies. Using a second survey experiment, I manipulate both ballot length and the candidates' attributes while monitoring voters' information acquisition strategies. Here I introduce an original online survey platform that fully randomizes the generation of the experimental ballots as well as a new measure of correct policy voting. I find that even for those voters who are not deterred by complex ballots, variations in the number of candidates can have substantial effects on their decision-making strategies. When presented with more candidates, many voters learn less about their options, rely on potentially unreliable cues of candidates quality, and make poor choices.

Chapter 1

Introduction

The willingness of voters to turn out on Election Day and select parties and candidates to represent them is the foundation of representative democracy. This dissertation is motivated by the puzzle of how voters make choices on Election Day in complex electoral environments. To an outside observer spending time in Brazil during campaign season or watching hours of televised campaign ads, one cannot help but be curious about how voters navigate a choice-making environment that is highly fluid and complex. In Brazil, more than two dozen political parties and dozens, hundreds, or in some cases over a thousand candidates regularly run in legislative elections in each district. In this respect, Brazil certainly lies on one end of the spectrum but is by no means an outlier. Elsewhere in Latin America, in Colombia, Ecuador, and Peru, voters are regularly asked to make choices in highly saturated political environments with an abundance of parties and candidates. In even younger and more fragile democracies in Iraq and Afghanistan, elections regularly present voters with hundreds or thousands of candidates from which to choose, with political parties or nascent political organizations providing little assistance in reducing choice set size or informing voters choices. How do voters respond to the complexity facing them in these environments and how does electoral complexity impact their willingness and ability to make choices?

In trying to understand how voters choose in complex electoral environments, the seminal work in American political behavior is of great theoretical utility but offers little practical help. This work has made invaluable contributions

to understanding how voters develop partisan attachments, acquire information, evaluate their options, decide whether or not to turn out, and make voting decisions (Campbell et al., 1960; Popkin, 1991; Rosenstone and Hansen, 1993; Lupia and McCubbins, 1998). However, these results have heretofore either been largely untested in more complex environments or is are limited applicability. Party identification for example, is well established as a cornerstone of American voting behavior, but is of less use in understanding voting behavior in democracies with weak party organizations or where substantial intraparty competition reduces the utility of party labels in making voting decisions. Most voters in Afghanistan or Brazil either cannot or do not vote based on party labels either because those labels are new and largely uninformative or because intraparty competition means that even strong partisan attachments are not sufficient for selecting candidates. In these systems, voters may be able to use weak party labels as a first step in a sequential decision-making strategy. However, even after limiting their choice sets to one or only a few parties, the number of candidates on each list may still present them with a significant cognitive challenge.¹

In comparative politics, scholars are increasingly interested in understanding how voters make choices in new democracies and in testing the extent to which what we have learned about American political behavior can be applied in other younger democracies (Brader and Tucker, 2009; Lupu, 2013; Morgan and Buice, 2013; Aguilar et al., N.d.). In Brazil specifically, scholars have developed national election surveys and used experiments and other tools long employed in American political behavior in order to be able to study the microfoundations of voting behavior there (Ames, Baker and Renno, 2006; Renno, 2004; Samuels and Zucco, 2014). This literature highlights a number of attributes of elections in young democracies that contribute to the complexity of the choices facing voters including the age of democratic systems, weak party organizations, corruption, and low information environments. This dissertation focuses on an additional, critical dimension of electoral complexity: the number of choices on the ballot.

The core question addressed in this dissertation is how the number of can-

¹This is well illustrated by the low rates of party list voting in Brazil where voters are given the option to cast votes for party lists but few do (Mainwaring, 1999).

didates in an election affects voters. Choice set size is only one determinant of electoral complexity and of the challenges facing voters on Election Day. However, as this dissertation shows, it is highly influential for voting behavior and decisive for some voters in determining whether or not they will turn out and make choices on election day and how they will select their representatives. The dissertation speaks to work on institutional design that evaluates the effects of electoral institutions on the representativeness of elected governments and policy outcomes. This work generally contends that, within limits, more permissive electoral systems tend to produce more representative elections, governments, and policy outcomes but can have costs for governability and accountability (Powell, 2000; Persson and Tabellini, 2005; Carey and Hix, 2011).

I propose that elections and electoral systems entail a tradeoff between representativeness and the cognitive costs to voters of making choices when presented with long ballots. Presenting voters with more choices nearly always makes elections more representative by allowing for a greater number of policy and policy positions to be represented and by allowing minority groups to enter competition (Cox, 1997; Taagepera and Shugart, 1989). However, increasing choice set size also increases the cognitive burden on voters, many of whom will be unwilling to make the investments necessary to make good choices as the costs of decision-making increase. As the dissertation demonstrates, more representative elections may thus lead many voters to avoid participating entirely and may lead others to make voting errors, particularly as the number of intraparty choices with which they are presented increases. These voter reactions have downstream costs for the quality of electoral democracy by distorting the composition of the electorate and leading elected governments to be less representative.

Choice set size is a fundamental attribute of virtually every decision we make and has been shown to impact choice-making in many facets of our lives, with more choice often leading us to worse outcomes (Iyengar and Lepper, 2000; Iyengar and Kamenica, 2010). In a wide range of circumstances, many people (myself included) find themselves overwhelmed by choice and altering their decision-making strategies when presented with too many choices. It is thus somewhat surprising

that choice set size is only occasionally mentioned in work on institutional design and that the cognitive and informational challenges that long ballots present for voters have rarely been studied in depth. The number of choices in an election is a fundamental attribute of the electoral environment, even in systems or elections that political scientists or even voters might not typically consider to be complex.

I return to this question of scope and generalizability throughout the dissertation and in the conclusion in particular, but there is little reason to think that the effects of choice set size identified here should only be found in the most challenging of elections and political systems. Even in developed democracies with established political parties, evaluating and making choices from only a few parties or candidates is fundamentally different from evaluating larger choice sets. The extent to which voters can effectively navigate larger choice sets because of the availability and strength of party cues, ideological positions, or other information shortcuts is a promising subject for future research. In particular, the number of inter-party choices facing voters may present voters with different (likely lesser) cognitive challenges than the number of intraparty challenges. However, the effects of choice set size identified in the dissertation should be observable in any political system, even though their magnitude may vary based on other features of elections.

The dissertation proceeds as follows. In Chapter 2, I examine the relationship between the number of candidates and turnout in Brazilian municipal elections. Turning out on Election Day and casting a valid vote is the least a voter can do to have his or her preferences represented by elected governments and in policy outputs. For many voters though, the complexity of the choices facing them in elections may outweigh the benefits of participation. Using data from four elections in over 5,000 Brazilian municipalities I identify a negative relationship between the number of candidates and participation rates. In these elections, where more candidates run for office, fewer voters turn out and cast valid votes.

Chapter 3 tests the microfoundations of the relationships identified in Chapter 2 and attempts to establish a causal link between the number of candidates on the ballot and abstention rates. To do so, I employ data from a survey experiment

that randomly varies ballot length and the availability of information about candidates' partisan affiliations. An experimental design allows me to create exogenous variation in the number of candidates on the ballot and observe participation decisions at the individual rather than the aggregate level. I find that increasing ballot length substantially reduces participation rates and that party labels increase participation. Surprisingly though, I find that the effects of choice set size on abstention persist even where information about candidates party positions is available to voters and there are only at most three candidates from each party on the ballot.

The dissertation then turns to the next logical question – the effect of the number of candidates on the *quality* of voting decisions for voters who do choose to participate in elections. Chapter 4 employs a second survey experiment that randomly varies the number of candidates while monitoring voters' information acquisition strategies and evaluating the quality of their voting decisions. I introduce an original online survey platform that fully randomizes the generation of the experimental ballots as well as a new measure of correct policy voting that can be used to evaluate the quality of the fit between voters' policy preferences and candidates' policy positions. I identify a number of voter responses to longer ballots. When presented with more candidates, some voters avoid acquiring costly information about candidates, others rely more on cues of candidate quality like ballot order, and others attempt to reduce the dimensionality of an increasingly complex policy space when making choices. Perhaps most importantly, I observe a significant increase in the rate of voting errors, even as the number of candidates increases from only three to six and then to twelve. Chapter 5 concludes by discussing some implications of my findings and outlining avenues for future research.

This dissertation identifies a number of responses and costs to increasing the number of candidates in elections. Some voters are less likely to participate, others alter the criteria used to select representatives, and many are more likely to make poor choices. Even modest increases in electoral complexity can thus have profound implications for the quality of electoral democracy. More representative

elections thus represent a trade-off between increasing the probability of a good fit for some voters while inhibiting others from participating, selecting representatives, and holding elected governments accountable.

Chapter 2

Political Participation and Choice Set Size in Brazilian Municipal Elections

2.1 Introduction

How are voters affected by the number of choices on the ballot? Increasing the number of parties and candidates in competition increases the probability that a good choice will be available for most voters. However, elections with more parties and candidates are fundamentally different from those with fewer. For voters in particular, the challenges of longer ballots can be substantial. The entry of additional parties and candidates can entail significant information costs and may be demotivating for some voters who are overwhelmed by more choice. As a result, elections and electoral systems that seek to provide some voters with improved representation by allowing for more choice may have the unanticipated effect of demobilizing voters and reducing political participation.

Surprisingly, we know relatively little about the effect of political institutions on turnout and even less about how the number of choices on the ballot affects participation. This chapter addresses this void by directly testing for a relationship between the number of candidates in elections and voter turnout. Using

subnational data from municipal elections in Brazil, I test for a relationship between choice set size and aggregate participation rates. This subnational approach has a number of methodological advantages over the cross-national studies that are typically used to study the institutional determinants of turnout.

I find a robust negative relationship between the number of candidates in an election and participation rates. In four municipal elections from 2000 to 2012, Brazilian municipalities with more candidates had lower participation rates than those with fewer. These results suggest that many voters are unwilling to bear the costs of making decisions in complex electoral environments that present them with an abundance of choices. Although some voters may benefit considerably from longer ballots on Election Day, many others are unwilling or unable to take advantage of more representative elections.

In the next section I outline scholarly work on political institutions and turnout, highlighting the lack of clear evidence on the effects of choice set size on participation. I then discuss some methodological challenges to identifying a relationship between ballot length and participation before describing my own data and approach. The chapter then describes the results of my analysis before concluding with a discussion of the implications of those results for voters and scholars of political institutions and electoral behavior.

2.2 Institutions, Voting Decisions, and Turnout

The consequences of electoral institutions and the determinants of voter turnout are two of the most widely studied themes in political science. It is thus quite surprising how little is known about the effects of institutions on turnout. In his review of work on the causes of turnout, Blais writes, “All in all, our understanding of the impact of institutions on turnout is shaky” (Blais, 2006, 116). At fault is neither a lack of interest nor a dearth of work on this subject. Rather, what work has been done has often reached inconsistent conclusions. Partly to blame is the cross-national approach that dominates the field. As I discuss in more depth below, the lack of variation in electoral institutions across time makes it difficult

to identify any effects of those institutions on turnout.

Perhaps the only institution that has consistently been shown to impact turnout is compulsory voting, although even here we lack a thorough understanding of the microfoundations of this relationship and the degree to which sanctions and enforcement are necessary mediators (Blais, 2006; Blais and Aarts, 2006). With respect to electoral systems, district magnitude (M), and choice set size, results are far less conclusive. Much work has followed Jackman's (1987) seminal work on institutions in industrialized democracies and tested for a relationship between the effective number of parties (ENP) and turnout. However, results have been mixed, with some studies finding a negative relationship (Jackman, 1987; Blais and Dobrzynska, 1998; Kostadinova, 2003) and others finding no relationship at all (Perez Linan, 2001; Fornos, Power and Garand, 2004; Power and Roberts, 1995; Power and Garand, 2007). Results on the relationship between district magnitude and turnout are also mixed with some studies finding a negative relationship (Fornos, Power and Garand, 2004), others a positive relationship (Jackman, 1987; Powell, 1986), and others with null results (Perez Linan, 2001; Power and Roberts, 1995) or only identifying differences in turnout between systems with $M=1$ and $M>1$ (Grofman and Selb, 2011).

One interpretation of these varied results is that institutional effects on voting behavior apply in some regions (e.g. Western Europe) but not others (e.g. Latin America). Alternatively, institutions may only affect turnout in older consolidated democracies. Both of these explanations are somewhat unsatisfying. If in fact there are institutional determinants of turnout, any such relationships should not be conditional on region. With respect to democratic consolidation, weak institutions might explain null findings in some cases like compulsory voting enforcement but this connection is less clear for other institutions like electoral formulas. It is not clear for example, why the effects of district magnitude on voters' participation decisions would be conditional on the age of the democracy (perhaps beyond the first election under a new configuration).

It is more likely that our lack of understanding of the effects of institutions on turnout is the result of the methodological challenges facing work in this area as

well as a lack of clarity about the mechanisms underpinning any such relationships. Two popular mechanisms lead scholars to opposing predictions about the effects of district magnitude and the number of parties on turnout. On the one hand, increasing the number of choices on the ballot increases the likelihood that a good fit will be available for voters on Election Day and should result in increased participation by voters who are motivated by better options on the ballot. In addition, with more parties in competition, voters may also be more likely to be targeted by parties for mobilization. On the other hand, multiparty systems may lead to a lack of clarity over coalition formation and policy outcomes and thus deter some voters from participating. With respect to the number of parties, Blais is led to conclude that “The bottom line is that we have a poor understanding of the relationship between the number of parties and turnout” (Blais, 2006, 118).

One mechanism that has not been tested is that choice set size itself may be influential in voters’ participation decisions. Elections with more parties and candidates present voters with distinct information and decision-making challenges and may fundamentally alter their calculations about whether or not to participate. As the number of parties and candidates in an election increases so too does the amount of information and voters’ information acquisition costs. Many voters may be unwilling to bear the increased information costs associated with more choices and may instead choose to abstain. In addition, as more parties and candidates enter competition, they will tend to represent both a wider range of policies and policy positions, but also narrower ideological spaces (Cox, 1997; Persson and Tabellini, 2005). As a result, distinguishing between alternatives will become increasingly challenging and may further deter many voters.

Where party labels have some information content, increases in inter-party competition will be more manageable for voters than increases in intraparty competition. Voter seeking to choose from increasing number of parties or candidates on different party lists can rely at least in part (if not entirely) on party labels to make those decisions. Increases in intraparty competition however, weaken the power of party labels as information shortcuts. Even if voters can use party labels as a first step in a sequential decision-making strategy, as the number of candidates from

each party increases, the value of party labels in facilitating choice is diminished. In addition, if candidates on the same party lists present similar policy positions or adopt their parties' platforms, the costs of distinguishing between those options will increase substantially with the number of candidates on each party list. In this sense, increases in inter-party and intraparty competition present voters with different challenges. Although virtually any increase in the number of choices will increase the cognitive challenges facing voters in elections, intraparty competition will be particularly problematic.

Although increasing choice set size can potentially improve the fit between voters and candidates, it can also make mistakes more likely. Elsewhere, using data from a survey experiment that randomizes ballot length, I show that even small increases in the number of candidates can lead many voters to rely on potentially unreliable cues of candidate quality and make poor choices (Cunow, 2014). Voters aware of the challenges of making good choices when presented with large choice sets may be more likely to abstain rather than running the risk of making mistakes or making sufficient investments to avoid them.

In addition to the informational challenges facing voters navigating elections with multiple parties and candidates, emotional challenges may also play a role in inhibiting participation. Exposure to a political campaign crowded with choices and information may overwhelm, dissatisfy and demotivate many voters. As a result, many voters will choose to abstain to limit the negative emotional toll that choice-making in a complex electoral environment can entail.

The cognitive consequences of choice set size have heretofore been largely unaddressed in political science but have been studied extensively in other academic disciplines. This work identifies a number of costs to presenting people with more choice. Larger choice sets can lead to poor decision-making (Iyengar and Lepper, 2000; Iyengar and Kamenica, 2010). Increasing choice set size can also lead people to avoid decision-making entirely in order to avoid regret over suboptimal choices and because they are "demotivated" by an abundance of options (Schwartz et al., 2002; Iyengar and Lepper, 2000). These same costs of large choice sets that affect voters in their non-political lives should also impact many in their political

choices as well. As the number of choices in an election grows, more voters will make mistakes and many will avoid participating altogether.

This chapter is the first to use observational data to test for a relationship between the number of candidates and voter turnout. Power and Roberts (1995) theorize that a “fluid political market” may reduce voter efficacy and suppress participation, but their analysis is limited to the number of parties as a proxy for the number of candidates in competition.¹ Other work has shown that the introduction of electronic voting can drastically reduce the number of spoiled ballots in systems with an abundance of candidates (Fujiwara, N.d.; Hidalgo, N.d.). Elsewhere, I identify a deterrent effect of choice set size on participation using data from a survey experiment conducted with Brazilian voters (Cunow, 2012). This study is the first to directly test for these effects using subnational data on voter participation.

2.3 Methodological Challenges in Determining What Affects Turnout

Scholars face a number of challenges in determining which institutions and features of elections affect turnout. Finding variation in participation rates is easy. Turnout varies dramatically across countries and within countries across time. More difficult however, is identifying otherwise comparable elections that vary only in the explanatory variable of interest. Characteristics of elections that are of theoretical interest like electoral salience, economic conditions, party systems, or electoral institutions rarely vary exogenously from other factors that also influence participation.

By far the most common approach in the field has been to use cross-sectional data to explain variation in turnout rates across countries (Blais, 2006, 121). These studies have yielded a number of important findings about the features of elections that are related to turnout but they are not suited to making causal inferences.

¹This approach has the benefit of speaking directly to Jackman’s (1987) work by using the same ENP variable but at the cost of obscuring substantial variation in the the number of candidates across the elections included in the study.

Observed differences across countries in participation or the explanatory variables of interest may be the result of any number of unobserved confounds rather than the characteristics included in those analyses (Desposato, 2006).

Cross-national work that employs time-series analysis also suffers from some methodological limitations. From a research design perspective, political institutions are especially problematic. With the exception of relatively rare cases of institutional reform, political institutions tend to be stable and vary little over time. Even institutional reforms should usually not be considered exogenous shocks (Boix, 1999) and will not tend to occur to the same institution across multiple cases within the same time period, thus providing little empirical leverage.

Cross-national studies also often collapse and distort important subnational variation by using national averages as data points. For example, in the Brazilian case presented in this chapter, district magnitude in municipal elections averages approximately 10 but ranges from 9 to 55 (see Table A.1). Using averages from subnational units as data points may create excess noise or in some cases even lead researchers to misleading conclusions.

The standard explanatory variables in the literature that relate to choice set size are the number or effective number of parties and district magnitude. From a research design perspective these are both particularly difficult variables to study in isolation. Like many other electoral institutions, district magnitude rarely varies within cases across time with the exceptions of occasional and often minor adjustments for changes in population size or even rarer instances of electoral reform that also alter other critical attributes of the electoral system. As a result, including district magnitude in cross-national studies is problematic in that there is very little variation across time that can allow us to identify effects of M independent of country-specific confounds. Relatedly, where we observe variations in the number of parties in national elections, they are most often symptomatic of other changes in electoral dynamics that may be related to participation and other outcomes of interest.

In this chapter I focus instead on the effect of the number of candidates on voter turnout. Theoretically and practically, district magnitude and the number

of parties do not directly capture the choice sets facing voters in many systems. In elections which allow voters to cast preference votes, neither district magnitude nor ENP capture the full set of choices available to voters, which is all of the candidates available on each party list in their district. Practically, although district magnitude, and to a lesser extent ENP, are highly correlated with the number of candidates, they are imprecise measures of choice set size. Figure 2.1 shows the distribution of the number of candidates running for office in 2012 in Brazilian municipalities with district magnitude of nine (the modal value in the data used in this chapter). In these municipalities, the number of candidates ranges from 10 to 185 with a standard deviation of 23.5.²

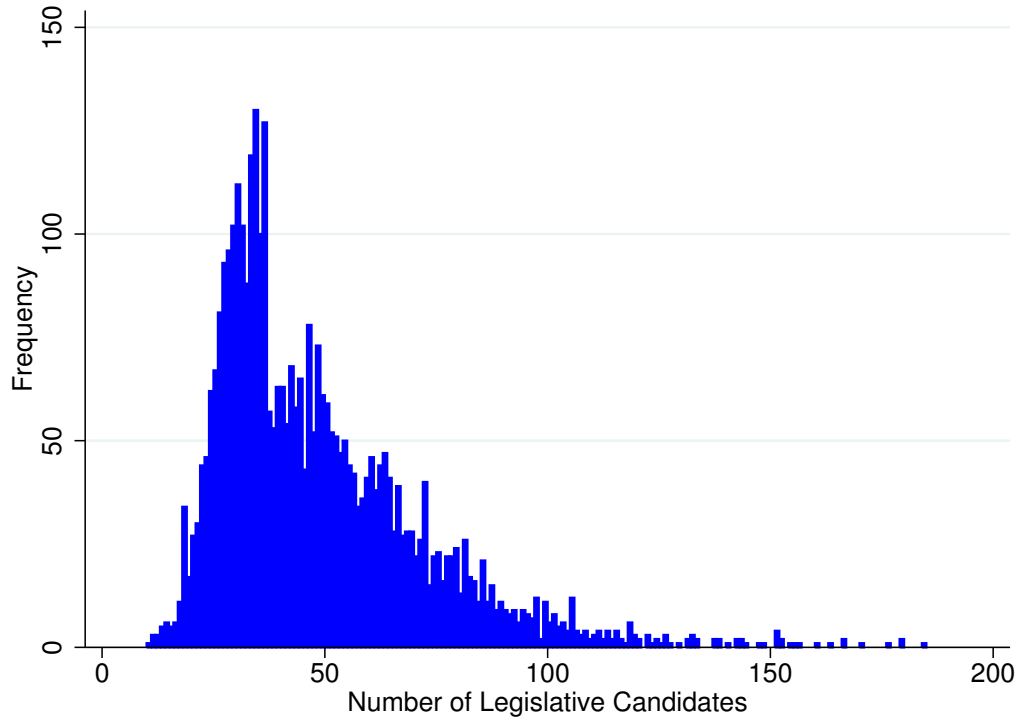


Figure 2.1: Number of Legislative Candidates in Municipalities with $M=9$ in 2012

A final methodological peculiarity in the extant literature is a focus on different dependent variables across regions. In general, work in developed democracies tends to focus on voter turnout - the proportion of registered voters turning

²This variation may be less pronounced but nonetheless present in other democracies.

out on Election Day. In developing democracies and in Latin America in particular, many studies on participation focus on the proportion of voters casting blank or spoiled ballots (one exception is Perez Linan (2001)). This discrepancy is in part because of the prevalence of compulsory voting and high rates of blank and null voting in Latin America. However, in order to participate in elections, voters must turn out and cast valid votes.³ In this chapter I combine the approaches adopted by work in developing and developed democracies and focus on the *effective participation rate* - the proportion of registered voters turning out on election day and casting valid votes. Given the focus of this chapter on the willingness and ability of voters to make choices when presented with ballots of different sizes, this measure most directly and completely captures participation.

In sum, there are a number of practical and theoretical challenges to identifying what affects turnout, particularly for scholars interested in understanding the effects of political institutions. These difficulties may explain why our understanding of the effects of institutions on turnout is so tenuous. In this chapter, I use a novel approach that overcomes some of these challenges and attempts to contribute to our understanding of how voters behave in electoral environments that present them with an abundance of choice.

2.4 Data and Research Design

This chapter is the first to test for a relationship between the number of candidates and participation rates in subnational elections. I employ data from four municipal elections in Brazil from 2000 to 2012. Brazil's municipalities are an ideal case to test for a relationship between choice set size and participation rates. The number of municipalities is large and there is considerable variation in participation rates and the number of candidates, even across otherwise similar municipalities. Every four years, Brazilians elect mayors and local legislators

³Casting blank or null ballots can be interpreted as a form of political participation and can even alter electoral outcomes if the proportion of invalid votes is substantial. However, only voters casting valid votes directly express their preferences for particular parties or representatives in the voting booth.

(*vereadores*) in each of the country's more than 5,000 municipalities. Mayors are elected using simple plurality rules in municipalities with less than 200,000 inhabitants. In municipalities with more than 200,000 inhabitants, a run-off election is held if no mayoral candidate wins a majority of the valid votes cast. Municipal legislators are elected using an open-list proportional representation system in at-large districts; each municipality constitutes a district. In legislative elections, district magnitude is assigned to municipalities based on population "bands" such that within set population ranges, municipalities must have a certain number of seats in the legislature.



Figure 2.2: Electronic Voting Machine Used in Brazilian Elections

Source: Tribunal Superior Eleitoral

In all Brazilian elections, turnout is compulsory for voters over 18 and under 70 years of age, but once in the voting booth, voters are given the option to cast a preference vote for an individual candidate, a party list vote in legislative elections, or a blank vote. Votes are cast on electronic voting machines of the type shown in Figure 2.2. The white button on those machines casts a blank vote rather

than a vote for a candidate or party. The majority of Brazilian voters turn out on Election Day and cast valid preference votes for individual candidates. Few cast votes for party lists and most of the list voting is concentrated within only a handful of parties on the left (Mainwaring, 1999). In the 2012 municipal elections for example, less than of 8% of valid votes cast nationwide were for party lists (Tribunal Superior Eleitoral, 2014). There is however, considerable variation in effective participation rates. Figure 2.3 shows the distribution of participation rates in the four municipal elections in my sample.

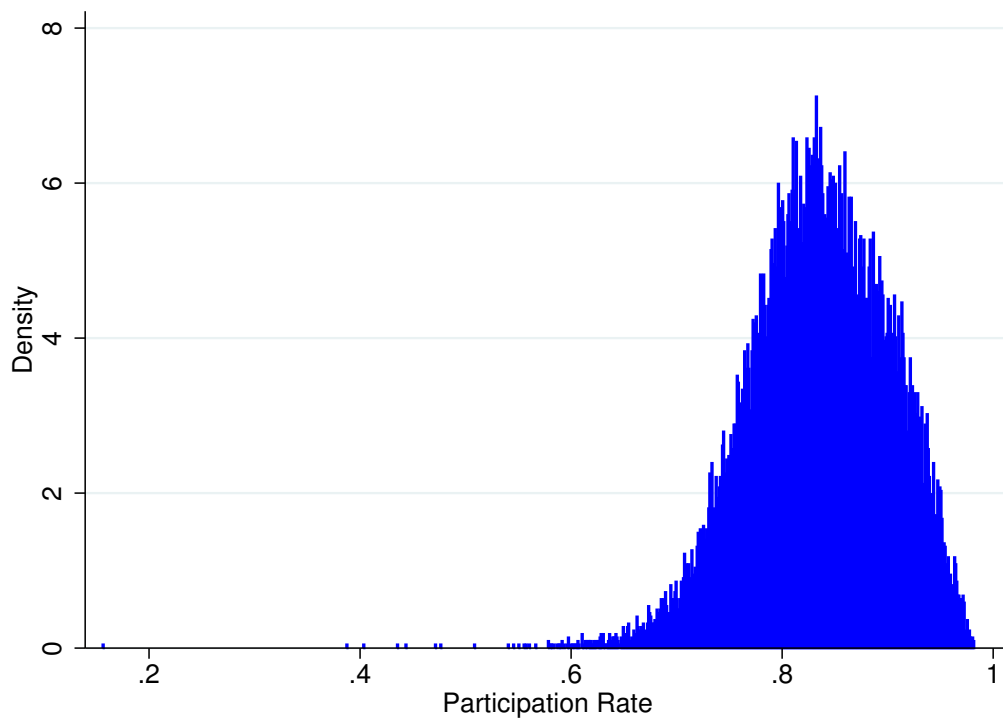


Figure 2.3: Histogram of Participation Rates in Municipal Elections 2000-2012

I use data from these elections to test for a relationship between the number of legislative candidates in a municipality and municipal-level participation rates. As explained above, I use as my measure of participation the proportion of the electorate in each municipality casting a valid vote for a legislative candidate or a party list. The analysis focuses on legislative elections because they provide greater variation in choice set size than mayoral elections. 93.6% of mayoral races in my sample have four or fewer candidates. Choice set size in elections for *vereador*, on

the other hand, vary widely.

I use a set of time series regression models to test for changes in participation rates over time as the number of candidates varies. This approach has a number of benefits over cross-sectional and cross-national analysis. Perhaps most importantly, time series data leverages variation across cases across time rather than differences between cases at one point in time. “Fixed effects” can be added to control for time-invariant, municipal characteristics not captured by the other covariates. Subnational data also has the advantage of comparing more similar cases than cross-national analyses and holding constant a number of potentially influential contextual variables including national political and economic conditions.

2.5 Results

I test for a relationship between the number of candidates and participation rates using a series of regression models. In these models, the dependent variable is the effective participation rate in a municipality and the independent variables are the number of candidates and district magnitude.⁴ I control for municipal characteristics using data from Brazil’s Institute of Geography and Statistics (IBGE), the governmental body responsible for conducting the census and other data collection. Summary statistics for the variables included in the analysis are presented in Table A.1.

Table 2.2 presents the results of two models regressing participation on district magnitude and other municipal covariates. The first model uses ordinary least squares regression with municipal “fixed effects”. OLS is a commonly used approach in studies of turnout but it may not fully capture average effects across the distribution of the dependent variable which is a proportion and therefore bounded at zero and one (Papke and Wooldridge, 2008). For the second model, I follow Fornos, Power and Garand (2004), and use a pooled cross-sectional time-

⁴I exclude the effective number of parties from my analysis because given the low rate of party list voting, the effective number of parties does not capture well the variation in choice set size available to voters in these legislative elections.

Table 2.1: Summary Statistics

	count	mean	sd	min	max
Valid Votes	22203	0.83	0.07	0.16	0.98
Logit Valid	22203	1.71	0.53	-1.69	3.95
Number of Candidates Vereador	22199	65.55	66.66	9.00	1627.00
District Magnitude	22199	9.95	2.55	9.00	55.00
ENC Vereador	22199	32.37	20.11	5.59	294.08
Margin of Victory Mayor	22198	0.18	0.21	0.00	1.00
Number of Candidates Mayor	22198	2.74	1.10	1.00	15.00
Percent Urban	21711	0.62	0.22	0.02	1.11
Percent Female	22147	0.49	0.02	0.19	0.55
Percent 70 or Older	22146	0.05	0.02	0.00	0.15
Illiteracy Rate	21980	17.84	10.99	0.06	62.50
Population (millions)	22151	0.00	0.00	0.00	0.00
Year	22203	2006.00	4.47	2000.00	2012.00
Observations	22203				

series generalized linear model. This model specifies a binomial distribution for the dependent variable with a logit link and a one period serial correlation structure. Results from both models in Table 2.2 indicate a significant negative relationship between district magnitude and participation rates. In municipal elections with higher M, participation rates were lower than where district magnitude was lower. Elections with more mayoral candidates also had significantly lower participation rates than those with fewer. As expected, mayors' margin of victory was also negatively associated with participation – more competitive elections tended to have higher turnout.⁵

District magnitude is an important determinant of ballot length but is a somewhat noisy measure of the size of voters' choice sets, especially in Brazil. Table 2.3 more directly tests for effects of choice set size on participation rates by regressing the proportion of valid votes on the number of candidates. These results indicate a significant negative relationship between choice set size and participation rates. In municipalities with more legislative candidates, voters were less likely to turn out and cast valid votes. In both models, municipalities with more mayoral

⁵Models which include district magnitude as a logged term produced similar results.

Table 2.2: Regression Models of Participation on District Magnitude

	OLS (1) Valid Votes	GLM (2) Valid Votes
District Magnitude	-0.00172*** (0.000182)	-0.0279*** (0.00109)
Margin of Victory Mayor	-0.0248*** (0.00175)	-0.184*** (0.0113)
Number of Candidates Mayor	-0.000397 (0.000381)	-0.0220*** (0.00227)
Percent Urban	0.0530*** (0.0111)	-0.291*** (0.0261)
Percent Female	-0.281*** (0.0735)	-2.067*** (0.318)
Percent 70 or Older	-0.500*** (0.0480)	2.109*** (0.226)
Illiteracy Rate	-0.000802*** (0.000163)	-0.0147*** (0.000482)
Population (millions)	-0.240*** (0.0682)	0.0320 (0.0346)
Constant	1.008*** (0.0362)	3.334*** (0.148)
Fixed Effects	Yes	-
N	21702	21612

Robust clustered standard errors

Pooled cross-sectional time-series logit model

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

candidates also had significantly lower participation rates.

Figure 2.5 shows predicted participation rates from the logit model in Table 2.3 for “average” hypothetical municipalities. These municipalities are assigned the mean value of the covariates in the model and the number of legislative candidates is varied from the lowest value in the data (9) to the highest (1,627). For

Table 2.3: Regression Models of Participation on Number of Candidates

	OLS (1) Valid Votes	GLM (2) Valid Votes
Number of Candidates Vereador	-0.0000555*** (0.0000128)	-0.00185*** (0.0000874)
Margin of Victory Mayor	-0.0250*** (0.00175)	-0.187*** (0.0114)
Number of Candidates Mayor	-0.0000557 (0.000389)	-0.00790*** (0.00243)
Percent Urban	0.0560*** (0.0111)	-0.236*** (0.0260)
Percent Female	-0.295*** (0.0744)	-1.926*** (0.316)
Percent 70 or Older	-0.493*** (0.0480)	1.593*** (0.230)
Illiteracy Rate	-0.000878*** (0.000163)	-0.0165*** (0.000483)
Population (millions)	-0.221*** (0.0626)	0.126*** (0.0127)
Constant	0.999*** (0.0366)	3.088*** (0.148)
Fixed Effects	Yes	-
N	21702	21612

Robust clustered standard errors

Pooled cross-sectional time-series logit model

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

these hypothetical municipalities, a one standard deviation increase in the number of candidates reduces participation rates from 84.7% with 9 candidates to 74.2% with 360. On the one hand, these large choice sets are well beyond what many scholars would consider to be necessary for improving representation. On the other hand, district magnitude in many of these municipalities is not much higher than

the “sweet spot” of three to eight identified by Carey and Hix (2011).

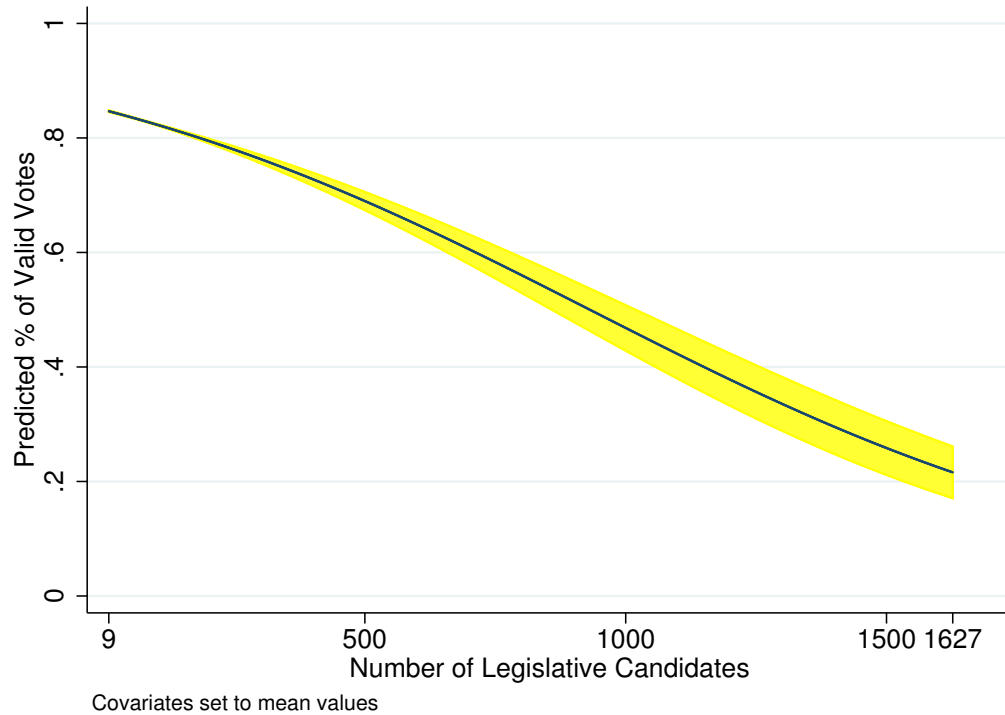


Figure 2.4: Predicted Participation Rate by Number of Legislative Candidates

Figure 2.4 shows predicted participation rates from hypothetical municipalities as the number of mayoral candidates is varied and the number of legislative candidates is set at the mean value in the sample. Increasing the number of mayoral candidates decreases participation rates, although the size of this effect is relatively small. As the number of mayoral candidates increases from 2 to 15 (the largest value in the sample), the participation rate decreases by approximately 1.5 percentage points.

A number of factors bias against these tests finding any significant relationship and suggest that these estimates may be biased downwards. Compulsory voting rules oblige Brazilian voters to turnout, even though they are not required to cast valid votes. Absent compulsory voting, many voters might stay home on election day when presented with increasingly large electoral choice sets. In addition, in more salient elections we may observe more candidate entry and increased participation. This mechanism also works against the tests presented here and

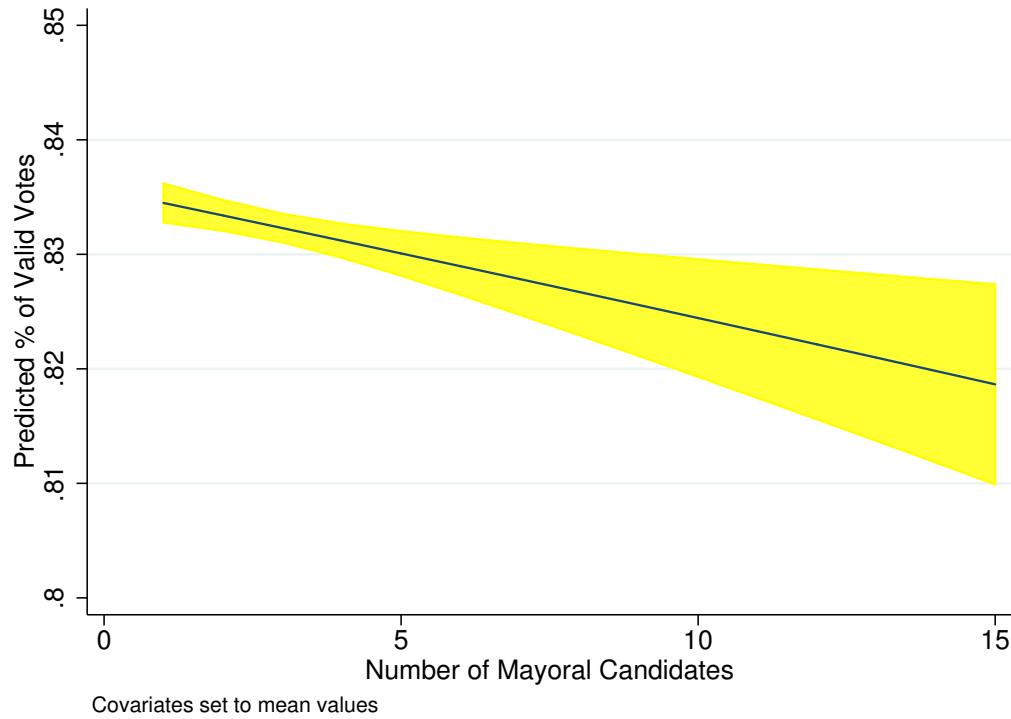


Figure 2.5: Predicted Participation Rate by Number of Mayoral Candidates

potentially biases any estimates downwards. As I discuss in more depth below, these results represent the net aggregate result of increasing the number of candidates and thus very likely underestimate the total number of voters deterred from participating by increasing choice set size.

2.6 Discussion

This chapter is the first to use subnational time-series data to test for a relationship between choice set size and political participation. In doing so, it seeks to avoid some of the methodological challenges associated with conventional approaches to identifying the effects of institutions on voter turnout. In addition, I highlight and test a new mechanism linking institutions to turnout – the number of choices presented to voters in an election.

All of the tests presented in this chapter identify a significant negative relationship between choice set size and participation. In municipalities in which more

candidates ran for office, participation rates were lower than in municipalities in which voters were presented with fewer choices. These results do not imply however, that *all* voters are less likely to participate when presented with more choices. Rather, the results presented here indicate that the net average relationship at the municipal level is negative.

There is likely considerable individual-level heterogeneity in voters' responses to increasing choice set size in elections. Some work in psychology for example, shows that our responses to large choice sets are dependent on our personality types (Schwartz et al., 2002). Some voters may find an abundance of choices to be motivating and may be more inclined to participate as the number of choices increases. Increasing the number of candidates running for office increases the likelihood that at least one of the choices available to any given voter will be a good fit for her. As more candidates enter competition, the degrees of separation between voters and candidates are also reduced such that it becomes increasingly likely that voters will have some personal connection to one of the candidates running in their district and will be more likely to turn out as a result.⁶

The tests in this chapter indicate that voters who are motivated to participate by more choice are significantly outnumbered by voters for whom larger choice sets deter participation. In the aggregate, more choice means less political participation even if that relationship does not apply uniformly across the electorate. In fact, unless individual heterogeneity in response to choice set size is distributed randomly across voters, increases in choice set size may distort the effective composition of the electorate. If voters who are adversely affected by choice set size are systematically different from those who are not, the electorate will change with the number of candidates in competition. For example, some work has shown that voters with less education are more likely to vote when voting procedures are simple (Gallego, 2010). If less educated voters are more likely to be deterred from participating by longer ballots, increasing the number of choices in an election may lead to voters with less education to be underrepresented. As Gallego (2010) observes, these effects will be even more pronounced in systems without compulsory voting.

⁶Of course, knowing a candidate may make voters likely to turn out in support or in opposition to someone they do not want elected!

Unfortunately, the aggregate data presented here do not allow us to identify which individual-level characteristics mediate responses to choice set size. Fine-grained exit polls might provide more leverage but would need to be conducted in a sufficient number of elections with variation in choice set size. Experiments would be better-suited to answering these questions because they can create (otherwise nearly impossible to find) exogenous variation in ballot length while measuring voter responses. In Chapters 3 and 4, I use experimental ballots to measure voter responses to choice set size but find no relationship between individuals' socioeconomic and political characteristics and their responses to increasing numbers of candidates (Cunow, 2012, 2014). It may be that responses to choice set size are influenced more by personality traits more than socioeconomic characteristics. Future work should seek to incorporate some personality tests into experimental designs that vary electoral choice set size to test for such relationships.

The results presented in this chapter have a number of implications for the study and design of electoral institutions. The cognitive costs of electoral institutions are largely unaddressed in academic work on institution design (Carey and Hix, 2011). Scholars generally assume that increasing proportionality and allowing for more party and candidate entry will improve the fit between voters and the parties and candidates they elect, albeit within limits and with some other costs. More choice means more policies and policy positions represented in elections, more representative legislative bodies and better representation for minority groups (Cox, 1997; Powell, 2000; Taagepera and Shugart, 1989; Persson and Tabellini, 2005). The results presented in this chapter highlight a limit to this logic. Although more choice in elections almost certainly means more representative elections, if some voters are deterred from participating by more choice, the representativeness of elected bodies and policy outputs will be limited. In addition, voters who do not cast valid votes cannot punish representatives for poor performance. In this way, elections with long ballots can impede the ability of voters to hold parties and representatives accountable.

Scholars of electoral institutions are almost certainly right that more permissive electoral systems that allow for more parties and candidates to enter com-

petition are likely to yield more representative elections that improve the fit between voters and their options on the ballot. The challenge is how we can facilitate choice-making for voters in multiparty environments and limit any deterrent effects of ballot length on participation. American voters know all too well that single member districts and two party competition are not necessarily the answer.

High magnitude districts tend to encourage party and candidate entry but limiting district magnitude does not always have the opposite effect, particularly in newer democracies and fragmented party systems.⁷ As a result, limiting district magnitude will likely not be sufficient to constrain choice set size. As is discussed above, in many Brazilian municipalities, districts with M of nine have dozens or even hundreds of candidates. Reducing the number of seats in those elections would certainly reduce the number of candidates on the ballot but perhaps not sufficiently.

Another institutional solution would be to limit the number of candidates competing for each seat. In some systems, including Brazil's, parties or coalitions are allowed to field more than one candidate per seat in each election. These additional candidates mean that voters' choice sets are often even larger than the number of seats in their districts multiplied by the number of parties. Where candidate entry is cheap, parties have incentives to pack their party lists with candidates who, regardless of their viability, can add to party or coalition vote totals even if they themselves are of low quality or unelectable. Limiting the number of candidates per party per seat in each district is another way of limiting choice set size and is a less drastic electoral reform than carving up high magnitude districts into lower magnitude ones (Bergman, Shugart and Watt, 2013).

Increasing the costs of candidate entry would also inhibit candidate entry and reduce choice set size for voters. Where registration and other entry costs are minimal, frivolous candidacies will proliferate. Although erecting substantial barriers to candidate entry is problematic for its own reasons, some intermediate solutions may strike a balance between discouraging frivolous entry and allowing for outsiders or poorly financed candidates to enter competition. Candidate deposits

⁷Party system fragmentation often goes hand-in-hand with high district magnitude but can also exacerbate its effects and increase choice set size even where M is more moderate.

are one example. Requiring that parties or candidates place a financial deposit that is returned if they achieve some low threshold of votes in their districts can discourage non-viable candidates from running for office while presenting less of a financial burden for candidates with fewer resources who are confident that their deposits will be refunded.⁸

Beyond legal and institutional constraints on choice set size, campaign content and how information is delivered to voters can also be used to limit the size of the choice sets in effective consideration by most voters and facilitate choice-making. Television ads, billboards, debates, and rallies in which voters are inundated with candidates either simultaneously or in rapid succession may be overwhelming and may have unintended cognitive costs that make voters less likely to turnout and vote for the candidates who are making appeals to them. Luckily, these unintended consequences give parties and candidates incentives to concentrate their campaign efforts and information delivery in such a way as to present voters with fewer effective options. Political campaigns, even when not coordinated by strong party organizations, have significant incentives to focus their efforts on sub-constituencies of voters and avoid saturated areas. The more they do so, the easier the choice-making burden on voters who will be exposed only to some subset of all the options on the ballot in their districts.

In order for voters to reap the benefits of representative elections and to hold elected officials accountable, they have to be empowered choice-makers. If large numbers of voters are deterred from participating by elections that inundate them with choices, legislatures will not adequately reflect citizens' preferences and legislators will not be accountable to their constituents. The benefits of more choice are tempting in elections much as they are in consumer and other contexts. As this chapter shows however, they also entail considerable costs. In addition to providing voters with a set of options that are a close fit for their preferences, elections and electoral institutions must also facilitate choice-making and empower voters to participate and make choices.

⁸Although candidates still need sufficient resources to place the deposit, candidates who are likely to surpass the deposit threshold may be able to find outside financial support for the deposit.

Chapter 3

Too Much Choice? Abstention Rates, Representation and the Number of Candidates

3.1 Introduction

A frequent complaint about elections in two-party systems is that they often force voters to choose between two or three candidates, none of whom is a good fit for their preferences. One obvious remedy for this problem is to provide voters with more choices. Increasing the number of parties and candidates in competition is likely to lead to improved substantive and descriptive representation in elections. However, for many voters, less choice in elections may be more. In this paper, I identify an overlooked cost associated with providing voters with more choice. Voters may find themselves overwhelmed by choice and unable or unwilling to identify quality representatives when presented with many options. As a result, as the number of parties and candidates competing in elections increases, some voters will abstain rather than selecting representatives. For many voters then, the enhanced representation which more parties and candidates can provide may be lost if they choose not to vote. This cost of providing more choice is fairly well-established in consumer choice and psychology but has heretofore received little

attention in political science.

In this paper I present the first test of the impact of choice set size on voter participation. I use data from a survey experiment conducted in São Paulo, Brazil to test for a relationship between the number of choices available to voters and the likelihood that voters will abstain. I find that increases in the number of candidates lead to a substantial increase in abstention rates. Moreover, I find that even a very modest increase in the number of candidates has a significant impact on participation. I also find that although party labels can help facilitate choice-making for some voters, they do entirely mitigate the effect of choice set size on abstention.

3.2 The Electoral Choice Set Problem

Scholarly work is fairly clear on the benefits of providing voters with more choice. Higher district magnitudes lead more candidates and parties to enter competition and those parties will tend to be more ideologically dispersed and will occupy narrower ideological spaces, thereby reducing the average distance between any given voter and the candidate to which they are most ideologically proximate (Cox, 1997; Persson and Tabellini, 2005). Proportional representation (PR) and higher magnitude districts are also more likely to yield multiparty legislatures that represent a wider range of preferences and provide better representation of minority groups (Powell, 2000; Taagepera and Shugart, 1989).

This paper focuses on a heretofore under-explored trade-off inherent to electoral systems. The existent literature assumes that voters will be able to identify the representatives who will best represent their preferences, regardless of the number of candidates competing in a district. I argue that many of the benefits to representation from increasing district magnitude may be lost on voters who are unable (or unwilling) to make satisfactory choices when they are presented with many candidates. Many voters may be unable to make choices when faced with an abundance of parties or candidates and may in fact be better off with fewer choices which, despite being less representative, may allow for an easier choice-making pro-

cess. In this paper, I show evidence of one manifestation of this problem: many voters are more likely to abstain when they are presented with more candidates.¹

The effect of choice set size on decision-making has received more empirical testing in psychology and consumer choice than in political science. This work shows that as choice set size increases, people are more likely to avoid making choices altogether as they seek to avoid regret over suboptimal choices or are “demotivated” by an abundance of options (Schwartz et al., 2002; Iyengar and Lepper, 2000). Larger choice sets have also been shown to lead choosers to perform poorly or make suboptimal choices, in some cases leading them to select simpler options and avoid risk (Iyengar and Lepper, 2000; Iyengar and Kamenica, 2010). Many of the challenges facing consumers dealing with large choice sets should also affect voters. As the size of their choice sets (the number of parties or candidates competing in their districts) increases, voters should therefore also be more likely to abstain or make suboptimal choices.

The electoral choice set problem and the cognitive costs associated with large choice sets has received only very limited treatment in political science. In fact, in a recent paper, Carey and Hix (2011) observe that, “To our knowledge, cognitive capacity has attracted no serious attention in research on electoral systems design” (Carey and Hix, 2011, 6). This paper seeks to fill that void and is the first to use an experimental design to test for a relationship between choice set size and abstention.

The experimental design presented in this paper also tests for the ability of political parties to ameliorate some of the difficulties associated with selecting candidates in high magnitude districts. Even where parties are insufficient for making choices because there is intraparty competition, they represent an additional piece of information about candidates that voters can use to filter candidates and effectively reduce large choice sets to more manageable sizes. The value of party cues to voters is well-established in work on voting behavior in the United States. Party

¹Few scholars of electoral institutions advocate for nationwide districts. However, even in the “electoral sweet spot” of M between four and eight identified by Carey and Hix (2011), voters’ choice sets may be large enough to deter participation, particularly in systems that allow for intraparty competition.

Table 3.1: Experimental Conditions

# of candidates	No Party	Party Cues
2	2, No Party	2, Party
3	3, No Party	3, Party
6	6, No Party	6, Party
12	12, No Party	12, Party

endorsements are influential cues for voters even in non-partisan elections in the U.S. and can increase the likelihood of “correct voting” (Squire and Smith, 1988; Lau and Redlawsk, 1997; Lau, Andersen and Redlawsk, 2008). Even in very weak or single party systems, party labels can facilitate issue taking and convey some information to voters (Brader and Tucker, 2009; Snyder and Ting, 2002). As such, even where partisanship is less entrenched than in stronger party systems, voters should be able to use party cues as a filter or “first cut” when selecting candidates.

3.3 Experimental Design

In order to test for a relationship between the size of voters’ choice sets and voting behavior, I employ data from a survey experiment conducted in São Paulo, Brazil from June 20 to August 4, 2011. 1,200 adults were surveyed by the author and a small team of Brazilian university students. Adults over 18, for whom voting is compulsory, were surveyed. Subjects were sampled in a diverse set of neighborhoods across São Paulo and surveys were conducted in person in public places including sidewalks, parks, and plazas.²

Survey respondents were presented with profiles of hypothetical candidates who they were told were considering running for federal deputy in the next elections and were asked who they would vote for or if they would prefer to abstain. All respondents, including those who abstained were asked to complete the entire survey such that, once they evaluated the candidate profiles, respondents’ marginal time savings from not selecting a candidate were minimal.

Candidate profiles included candidates’ names, photos, brief biographies,

²Summary statistics are presented in the Appendix.

	Sérgio Augusto Ribeiro - PT Sérgio é advogado graduado pela Universidade de São Paulo. Após concluir a universidade, trabalhou em um escritório de advocacia, antes de decidir dedicar a sua vida à política. Desde então, trabalhou no Tribunal de Justiça do Estado de São Paulo, onde serviu como uma ligação entre os legisladores estaduais e os juizes. Sérgio também tem trabalhado como agente do Ministério Federal da Justiça. Ele é casado com Juliana e tem dois filhos: Thiago, 12 anos, e Renata, 9 anos.
Impostos:	Sérgio vai aumentar os impostos sobre os ricos, a fim de aumentar os gastos governamentais em serviços sociais voltados para os pobres.
Saúde:	Para assegurar que as pessoas tenham acesso à saúde pública de qualidade, Sérgio vai construir novos hospitais e centros de saúde e contratar mais médicos.
Meio Ambiente:	Sérgio pretende proteger a Amazônia, e, ao mesmo tempo, desenvolver um programa sustentável para permitir que os pequenos agricultores se beneficiem de uma parte da floresta tropical.
	Fernando Lopes Damatto - PSDB Fernando se formou em economia pela Universidade de Campinas. Desde que decidiu seguir uma vida na política, ele trabalhou como assessor na Assembleia Legislativa do Estado de São Paulo, ajudando a planejar o orçamento do estado. Ele também trabalhou para o Ministério da Fazenda como consultor fiscal. Fernando deu aulas na Universidade do Brasil. Ele e sua esposa, Viviane têm dois filhos: João, 10 anos, e Gabriel, 6 anos.
Impostos:	A fim de aumentar os gastos públicos, Fernando pretende aumentar os impostos igualmente para todos os cidadãos.
Saúde:	Fernando criou programas de treinamento para médicos e enfermeiros para melhorar a qualidade do atendimento.
Meio Ambiente:	Fernando propõe proteger a Amazônia e permitir que empresas privadas aproveitem os seus recursos, desde que apresentem um plano de reflorestamento aprovado pelo governo.
	Leonardo Coelho da Silva - PMDB Leonardo se formou na Universidade de São Paulo, onde estudou contabilidade. Depois de completar seus estudos Leonardo trabalhou como contador privado. Após decidir se dedicar à vida política, ele trabalhou como chefe de gabinete e como gerente de campanha de um deputado estadual em São Paulo. Leonardo também trabalhou como consultor de orçamento para o Ministério da Minas e Energia. Ele é casado com Ana Carolina e tem dois filhos: Daniel, 11 anos, e Isabel, 7 anos.
Impostos:	Leonardo vai reduzir os impostos a fim de criar mais empregos e estimular a economia, mesmo que isso signifique cortar gastos públicos.
Saúde:	Leonardo irá fornecer mais incentivos para os prestadores privados de saúde abrirem novos hospitais e clínicas, permitindo que as pessoas tenham acesso a serviços privados de qualidade.
Meio Ambiente:	A fim de criar mais empregos e estimular a economia do país, Leonardo propõe dar acesso à Amazônia a empresas privadas e estrangeiras.

Figure 3.1: 3 Candidate Ballot

and policy positions on three of six issues. Survey respondents were randomly assigned to experimental conditions with 2, 3, 6, or 12 candidates. In this way, the experiment directly manipulates choice set size rather than district magnitude. Some subjects were randomly assigned to experimental conditions with party labels for Brazil’s three largest political parties (PT, PSDB, and PMDB). Subjects who saw party labels in experimental conditions with 6 and 12 candidates were thus exposed to intraparty competition with more than one candidate from each political party. Figures 3.1, 3.2, and 3.3 show examples of the paper ballots used in the experiment. All candidates were college-educated, had relevant professional experience and were married with children. Candidates were assigned policy positions that were consistent with their party labels. Table 3.1 shows the experimental conditions employed in the survey.

Brazilian voters are ideal subjects for this design because they are accustomed to navigating large choice sets in elections. In Brazilian legislative elections dozens, if not hundreds, or in some cases over 1,000 candidates from over two dozen parties normally run for office. Executive elections also often have half a dozen or even a dozen candidates in some cases. Although the effective number of candidates is typically lower than the legal number competing in a district, Brazilian voters are nonetheless a “tough test” in that they should be less likely than

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Figure 3.2: 6 Candidate Ballot

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 Glaucio de Sousa Matos - PT Glaucio de Sousa Matos trabalhou como diretor de projetos de uma ONG voltada para a assistência de famílias pobres da Região Metropolitana de São Paulo. Glaucio é formado em Serviço Social pela PUC. Depois de se formar ele se juntou a uma ONG. Glaucio já havia trabalhado como assistente do Ministério do Desenvolvimento Social e Combate à Fome. É casado com Leticia, com quem tem dois filhos, Otis, de 7 anos, e Mariana de 5 anos. Impostos: Glaucio propõe aumentar os impostos para toda a população de acordo com a renda de cada cidadão com o objetivo de ampliar os gastos sociais. Transporte: Glaucio vai comprar mais ônibus e criar novas faixas exclusivas para que mais pessoas possam utilizar mais ônibus e o trânsito melhore. Mais ambiente: Glaucio vai permitir acesso aos recursos naturais da Amazônia somente ao Governo Federal, que os usará para criar empregos e promover crescimento econômico.	 Alexandre Batista Calvora - PSDB Alexandre Batista Calvora é graduado em direito pela Universidade Mackenzie. Também como advogado em um dos maiores escritórios de São Paulo, se especializando em propriedade intelectual e outros assuntos ligados à tecnologia. Alexandre também trabalhou como consultor legal do Ministério da Ciência e Tecnologia. Ele e sua esposa, Pamela, têm uma filha de dois anos, Sofia. Comércio Internacional: Alexandre quer priorizar parte da Petrobrás para que ela seja mais competitiva internacionalmente. Privatizações: Alexandre quer criar um mercado de reflorestamento que permita assegurar que os recursos da Amazônia sejam aproveitados da forma mais eficiente possível.	 Nelson Borges Carvalho - PMDB Nelson Borges Carvalho trabalhou como economista do Banco Itaú, produzindo estatísticas de prevalências econômicas. Ele é formado em economia pela UNESP. Nelson também trabalhou no Ministério da Previdência Social ajudando a fazer mudanças no orçamento em virtude de mudanças econômicas de longo prazo. Ele tem três filhos: Guilherme, Vinícius e Antônio, com 5, 4 e 1 ano, respectivamente, e é casado com Cláudia. Saúde: Nelson vai limitar a produção de medicamentos genéricos para incentivar as empresas farmacêuticas brasileiras e estrangeiras a desenvolverem e produzirem novos medicamentos. Comércio Internacional: Nelson pensa que acordos comerciais com outros países deviam focar em coisas que eles são bons para a economia, pois depois de um período de ajuste todos serão beneficiados pelos acordos. Impostos: Nelson propõe a redução de impostos para impulsionar a economia, cortando ao mesmo tempo gastos do governo e deixando espaço para companhias privadas atenderem às necessidades dos cidadãos.
 Rogério Alves Napolitano - PT Rogério Alves Napolitano é graduado em ciências sociais pela Fundação Escola de Sociologia e Política de São Paulo. Depois de se formar ele trabalhou para a prefeitura de São Paulo, ajudando a construir um programa municipal de combate à pobreza às famílias residentes no cidade. Rogério é também professor de sociologia na UNESP, especializada em causas e consequências da pobreza. Ele é casado com Ana Maria e tem uma filha de 10 anos, Viviane. Comércio Internacional: Rogério acredita que todos os acordos internacionais deveriam ser renegociados para atender aos interesses das empresas brasileiras, que deveriam poder vender seus produtos em outros países sem impostos. Saúde: Rogério vai criar equipes de saúde que irão de casa em casa e atenderão às pessoas com qualidade em suas próprias casas. Transporte: Rogério vai priorizar a criação a Secretaria Federal de Transportes Urbanos para controlar as empresas de transporte público e melhorar o acesso dos cidadãos.	 Armando Jordão Silveira - PSDB Armando Jordão Silveira é formado em estatística pela UNESP. Depois de terminar a universidade, trabalhou para a Prefeitura de São Paulo como avaliador das políticas públicas municipais. Armando também fundou uma empresa de consultoria própria para desenvolver projetos de melhoria das operações de empresas e governos. É casado com Alina e tem duas filhas: Aracida e Thais, de 6 anos de idade. Comércio Internacional: Armando pensa que pode ser benéfico para os trabalhadores aceitar a flexibilização das leis trabalhistas para comprar acordos internacionais, pois isso aumentaria as exportações brasileiras. Transporte: Armando vai conceder a empresas privadas o controle sobre aviadões para assegurar que as viagens das leis de trânsito sejam pontuais e o trânsito reduzido. Saúde: Armando vai lutar contra o desperdício nos gastos com saúde para assegurar que o dinheiro seja bem gasto com gastos com saúde de qualidade.	 Carlos Augusto Ferreira - PMDB Carlos Augusto Ferreira é graduado em Jornalismo pela Faculdade Círculo Unib, Depois de se formar, trabalhou na Ouedine da Polícia Civil do Estado de São Paulo, produzindo relatórios sobre as atividades das polícias e relatando os eventos atuais com base em fontes oficiais. Carlos Augusto também trabalhou como correspondente brasileiro da BBC, produzindo reportagens sobre assuntos nacionais e regionais. É casado com Márcia e eles têm uma filha Bárbara, de 5 anos. Privatizações: Carlos Augusto vai trazer de volta para o governo controle de empresas privadas para fazer com que operem melhor para todos e gerem recursos para o governo. Mais ambiente: Carlos Augusto propõe proteger totalmente a Amazônia proibindo empresas e agricultores de extrair madeira e caçar a área da floresta. Transporte: Carlos Augusto vai estender as linhas de metrô e construir mais estações para alisar o trânsito para todos.

Figure 3.3: 12 Candidate Ballot

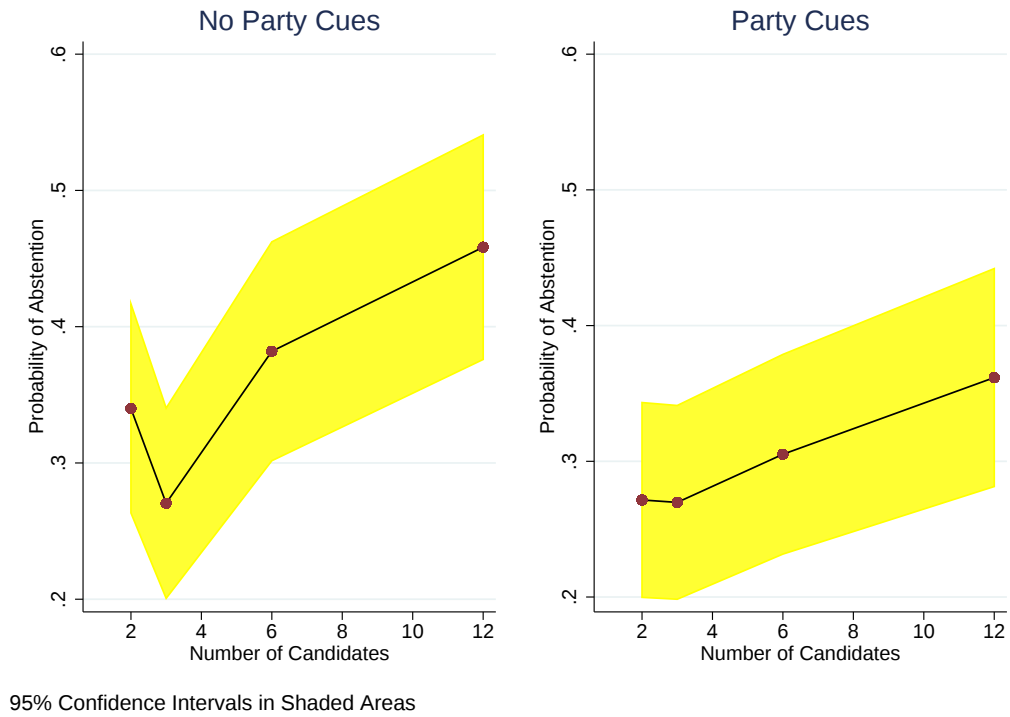


Figure 3.4: Choice Set Size and Abstention Rates

other voters to be deterred from participating when presented with large choice sets. In addition, given the weakness of most Brazilian party labels in elections (Mainwaring, 1999; Samuels, 2006), Brazilian voters should also be less likely than voters in other systems to be aided in making voting decisions by the presence of party labels.

3.4 Results

All results from this experiment indicate a significant and substantively large positive effect of choice set size on abstention. Voters who were asked to select representatives from larger sets of candidates were significantly more likely to abstain than voters who were presented with smaller choice sets. Voters who saw information about candidates' party affiliations were less likely to abstain than those who did not, but were also more likely to abstain when presented with more candidates.

Figure 3.4 presents the “raw” results of the experiment: sample means with 95 percent confidence intervals for abstention rates in the experimental conditions with and without party labels.³ These plots show a clear positive relationship between choice set size and abstention rates when voters were presented with more than three candidates. In the experimental conditions without party labels, abstention rates increased by nearly 70 percent as the number of candidates increased from three to twelve and were minimized somewhere between two and six candidates. The substantive size of this electoral choice set effect is therefore quite large, even as choice set size is increased to levels far lower than what is observed in many electoral systems, including Brazil’s.

Figure 3.4 also shows that party labels can help facilitate choice-making. Abstention rates for respondents who saw six or twelve candidates with party labels are lower than those for respondents who did not see information about candidates’ party affiliations (these differences are only significant at the 95% level for respondents who saw 12 candidates). However, even in experimental conditions with party labels, respondents who saw six or twelve candidates were more likely to abstain than those who saw only two or three. These results suggest that although parties can facilitate choice-making, they are not sufficient to eliminate the effect of choice set size on abstention.

Interestingly, the abstention rate for voters in the two candidate condition without party labels is quite high (almost 35 percent). This may indicate that the relationship between choice set size and abstention is in fact non-linear and that at low levels, the presence of additional options may make voters *more* likely to make choices.⁴

In all the experimental conditions the abstention rates observed in the ex-

³Attrition was minimal with a completion rate of 95% for respondents who began the survey. There is no precise record of the survey response rate but approximately half of the adults recruited for the survey participated.

⁴The lower abstention rates in the two candidate condition with party labels relative to the two candidate no party condition may be the result of the party labels used in the experiment. The PT and PSDB were the only party labels used in the two candidate condition. Those parties were the main governing and opposition parties in both the state and national governments at the time of the survey and may have represented a highly salient cleavage and easy choice for survey respondents.

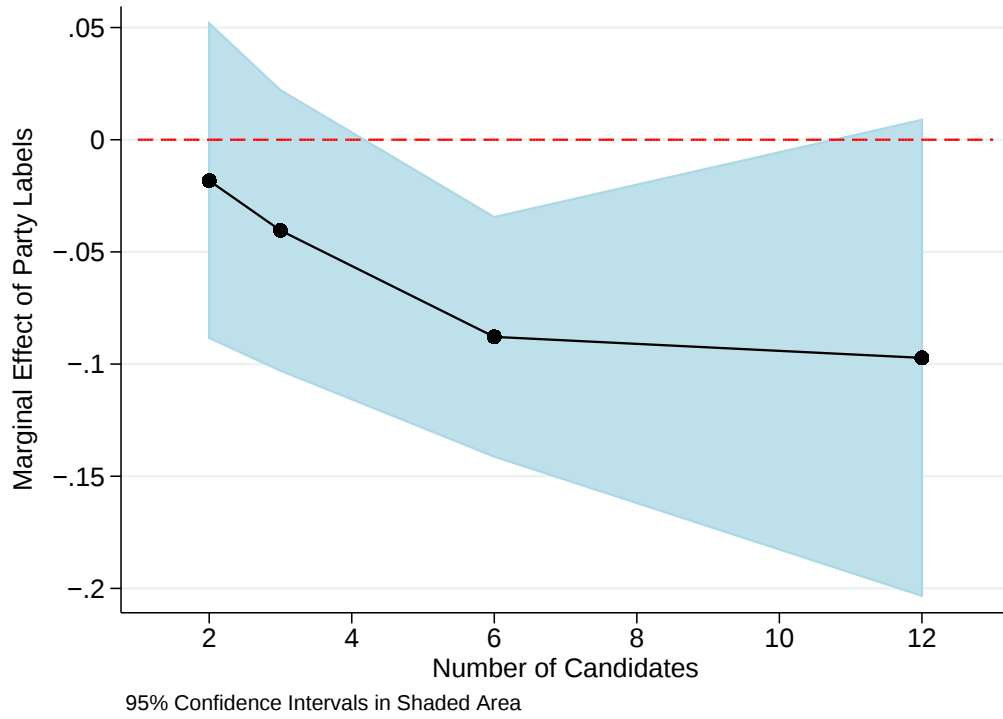


Figure 3.5: Marginal Effect of Party Labels on Abstention Rates

periment are higher than in most recent Brazilian elections. This is most likely because voting is compulsory in Brazilian elections but not in the survey. Moreover, although abstention rates in recent elections are lower than the rates observed in the experiment, “effective” turnout rates (the percentage of eligible voters casting valid votes) more closely approximate the rates observed in the experiment.

Logistic regression results presented in Tables 3.2 and 3.3 confirm the positive effect of ballot length on abstention rates. In these models, the dependent variable is an indicator which takes a value of 1 if a respondent abstained and a value of 0 otherwise. The treatment is the *Number of Candidates* variable in Table 3.2 or indicator variables for the number of candidates on the ballot in Table 3.3. Additional variables control for respondents’ levels of education, income, and political interest, as well as their age, gender, party identification, and whether or not they carefully considered their choices before making voting decisions.⁵

⁵Information about these variables is included in the Appendix.

Table 3.2: Logistic Regression of Abstention on Choice Set Size

	(1) Abstain	(2) Abstain	(3) Abstain	(4) Abstain
Number of Candidates	0.0558*** (0.0157)	0.0543*** (0.0169)	0.0539*** (0.0169)	0.0729*** (0.0234)
Party Labels			-0.287** (0.134)	-0.0504 (0.241)
Number of Candidates*Party				-0.0402 (0.0341)
Education		0.0741 (0.101)	0.0861 (0.101)	0.0867 (0.101)
Income		0.118 (0.0833)	0.115 (0.0833)	0.109 (0.0836)
Political Interest		-0.00834 (0.0790)	-0.0105 (0.0792)	-0.0128 (0.0792)
Careful Choice		-0.480*** (0.145)	-0.502*** (0.145)	-0.496*** (0.145)
Age		0.0326*** (0.00531)	0.0327*** (0.00532)	0.0331*** (0.00533)
Female		-0.240* (0.136)	-0.241* (0.136)	-0.243* (0.136)
Party ID		-0.596*** (0.137)	-0.577*** (0.138)	-0.582*** (0.138)
Constant	-1.028*** (0.111)	-1.983*** (0.388)	-1.857*** (0.392)	-1.964*** (0.404)
Observations	1195	1122	1122	1122

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3.3: Abstention and Choice Set Size with Indicator Variables

	(1) Abstain	(2) Abstain	(3) Abstain
2 Candidates	0.174 (0.179)	0.239 (0.193)	0.239 (0.193)
6 Candidates	0.341* (0.177)	0.430** (0.192)	0.430** (0.193)
12 Candidates	0.632*** (0.176)	0.657*** (0.190)	0.653*** (0.191)
Party Labels			-0.287** (0.134)
Education		0.0687 (0.101)	0.0807 (0.101)
Income		0.124 (0.0836)	0.120 (0.0836)
Political Interest		-0.00372 (0.0791)	-0.00596 (0.0793)
Careful Choice		-0.469*** (0.145)	-0.491*** (0.145)
Age		0.0328*** (0.00532)	0.0328*** (0.00533)
Female		-0.243* (0.136)	-0.244* (0.136)
Party ID		-0.600*** (0.138)	-0.581*** (0.138)
Constant	-0.994*** (0.128)	-2.024*** (0.400)	-1.898*** (0.403)
Observations	1195	1122	1122

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results of the regression models show a consistent and significant positive effect of the number of candidates on the probability that voters abstained. Party labels, on the other hand, had a significant negative effect on the probability that voters would abstain. The interaction model (Model 4 in Table 3.2) however, shows that there is no significant mitigating effect of party labels on the effects of increasing choice set size. This point is further illustrated in Figure 3.5 which shows the marginal effect of party labels on abstention rates as the number of candidates increases. Only with six candidates is there any significant marginal effect of party labels on abstention rates. In sum, regression models confirm that beyond three candidates, additional choices can deter some voters from selecting candidates and that party labels may in some cases be insufficient to mitigate these effects.

3.5 External Validity

All signs indicate that although the candidates profiles were fictitious, most respondents did not know they were and evaluated them in a fashion that was not drastically different from the way they might approach candidates in a real election. When asked, over 82 percent of respondents reported that the profiles of the candidates in the survey were the same or only slightly different from the candidates who ran in the last elections in São Paulo. Of those who felt they were different, many were unable to identify any differences when asked. Moreover, many respondents reported knowing the candidates or having voted for them in a past election suggesting that they were quite realistic.

In addition, the overwhelming majority of legislative candidates in Brazil receive little to no media coverage and have very scarce television advertising time (Albuquerque, Steibel and Carneiro, 2008). As such, the brief time survey respondents spent evaluating the hypothetical candidates may in fact be a reasonable approximation of how much time they are exposed to most legislative candidates. In fact, as some responses indicated, the candidate profiles may have in some cases provided *more* exposure to candidates' policy positions and personal backgrounds

than in a typical legislative election!

For obvious practical reasons, the set of information and heuristics available to voters in the survey was not exhaustive and could not possibly capture all of the available sources of information normally available in an election. However, the candidate profiles provided voters with a number of ways to learn about their options and make decisions. As such, although the candidates were hypothetical, abstention in the experiment was not driven by a lack of available information or information shortcuts that could have been used to make decisions, even quick ones. In addition, the regression results are robust to the addition of a control variable (*Careful Choice*) that account for whether respondents spent more or less than thirty seconds evaluating the candidate profiles before selecting one or abstaining. This suggests that the results of the experiment are not an artifact of respondents seeking to save time by abstaining.

3.6 Discussion

Political systems with only a handful of candidates and parties may be excessively limiting for many voters for whom the best candidate is a fairly poor match for their preferences. On the other hand, providing voters with more choice can be self-defeating if voters are unable to identify and vote for quality representatives. As is shown in this paper, increasing the number of candidates can deter participation by leading overwhelmed voters to avoid choice-making. Beyond suppressing turnout, increasing the size of voters' choice sets very likely also affects the quality of voters' choices. Voters who choose to navigate large choice sets face considerable information demands. As the number of candidates increases, most voters will acquire less information about each candidate and may acquire little to no information about some of their options. In many cases, voters may also rely more on information shortcuts that can be noisy or even misleading signals of candidate quality. It is clear that the probability of selecting the best candidate decreases in the number of candidates. However, the probability of selecting even a satisfactory representative also decreases as information costs increase. As a

result, even for voters willing to make choices when presented with long ballots, the probability of selecting a low quality representative will increase with choice set size. For many voters, then, less choice may be more.

For political scientists and designers of electoral institutions, more attention should be paid to the cognitive costs of multimember systems. Like other trade-offs associated with increasing the number of candidates and representatives, the ability of voters to make the most of the choices with which they are presented should be considered when studying and designing electoral systems. Future scholarly work could examine how the quality of voting decisions varies with the number of candidates. Are voters able to make satisfactory choices when half a dozen, a dozen, or a hundred candidates seek office in their districts? How do the information and the shortcuts voters seek change as the size of their choice sets increases?

Electoral systems are designed to provide representation, accountability, and governability. However, the extent to which they facilitate choice-making is an equally important feature of their design. If voters are unwilling or unable to select quality representatives, elections cannot effectively translate votes into representative elected bodies and policy outcomes. In this sense, facilitating voting decisions should be considered a primary objective of electoral systems and is a necessary precondition for their proper functioning.

Chapter 3 has been submitted for publication in the *Journal of Experimental Political Science*. The dissertation author was the primary investigator and author of this paper.

Chapter 4

More is Less (Representation): Choice Set Size, Information Acquisition, and Correct Voting in Multimember Districts

4.1 Introduction

How do voters respond to more choice in elections? As more parties and candidates enter electoral competition, voters stand to reap substantial benefits. Elections with a greater variety of options will tend to include a wider range of policy positions and candidate types – all of which should enhance substantive and descriptive representation. However, improved representation in elections does not necessarily translate into more representative elected bodies. Voters must first identify candidates who will be at least satisfactory, if not optimal representatives. This task becomes increasingly difficult as the number of candidates and parties increases.

In this paper, I argue that increasing the number of candidates fundamentally alters the way that voters evaluate their options and make voting decisions. Although some voters may thrive when presented with more candidates, others

may seek to simplify voting decisions by relying on information shortcuts, reducing the dimensionality of the issue space, or avoiding complex information entirely. As a result, although increasing the amount of choice in an election creates the conditions for improved representation, in many cases these improvements will not be realized. Many voters may benefit from elections with fewer options and a less burdensome choice-making environment that facilitates the acquisition of relevant information about candidate quality and a more careful consideration of the available options.

I test for a relationship between the number of candidates and voting decisions using a survey experiment which randomly varies the number of candidates while observing voting behavior. I administer this experiment on an original web-based survey interface that allows me to track voters' information seeking strategies and to estimate their preferences for various candidate attributes, and how those preferences may vary with the number of candidates. I focus on the probability that voters seek information about candidates' policy positions, the types of policy positions that are preferred, and reliance on information shortcuts. I also employ two measures of correct voting to test for variation in the quality of voting decisions as the number of candidates increases.

I find heterogeneous effects of the number of candidates on voting behavior across voter types. As the number of candidates increases, some voters acquire more information about candidates' policy positions and make good choices. Many other voters acquire less information about policy and rely instead on potentially unreliable cues of candidate quality when selecting representatives. Some other voters are more likely to avoid information about policy entirely as the number of candidates increases. As a result, a significant proportion of voters are more likely to vote incorrectly even with only a modest increase in the number of candidates. These results suggest that the ways voters adapt their information-seeking and decision-making strategies may inhibit representation in elections with more than just a few parties or candidates.

In the next section I outline scholarly predictions for the quality of representation in systems with more choice. I then outline the research design and survey

interface before presenting results from the experiment. The final section discusses the implications of my results for voters selecting representatives in multiparty or multi-candidate environments and for the study of political institutions.

4.2 Choice Set Size and Voting Behavior

A substantial body of work in political science is devoted to understanding the consequences of electoral institutions. One central debate in this literature is the optimal number of parties that should compete in elections and hold seats in government. Systems that allow for more parties to compete in elections, generally by increasing district magnitude, are thought to provide greater proportionality and more representative elections and elected bodies. The logic is clear. In districts with more seats (higher magnitudes), more parties will enter competition. They will tend to compete by occupying more of the ideological spectrum and narrower ideological spaces, thereby reducing the average distance between any given voter and the candidate or party to whom they are most proximate (Cox, 1997; Persson and Tabellini, 2005). Proportional representation (PR) and higher magnitude districts are therefore more likely to yield multiparty legislatures that represent a wider range of preferences (Powell, 2000; Taagepera and Shugart, 1989). Minority groups are also more likely to be represented in proportional systems with higher district magnitude (Taagepera and Shugart, 1989). These gains to representation are often associated with fairer or more just electoral outcomes (Powell, 2000; Lijphart, 1999).

Scholars debate whether these benefits outweigh the costs to governability and accountability that greater proportionality entails. There is little debate, however, that more choice in elections (at least at moderate levels) leads to more representative elected bodies.¹ Although few scholars advocate for very high magnitude districts with hundreds of candidates, it is generally assumed that expanding the number of parties in elections will translate into improved representation, albeit with other costs.

¹Taagepera and Shugart (1989) show that beyond a certain point very high magnitude systems may actually become less proportional because of a proliferation of small parties.

Implicit and critical to this logic is the ability and willingness of voters to evaluate their options in elections and identify satisfactory if not optimal representatives. In order for more representative elections to translate into more representative elected bodies, voters must select parties or candidates who are at least somewhat proximate to their preferences. In other words, although the availability of more options will virtually guarantee a closer fit for voters in elections, they can only achieve better representation if they can identify those candidates or parties who are closer fits to represent them in government. However, voters may not employ the same information acquisition strategies and decision rules with three candidates or parties as they would if presented with six, twelve, or more. In particular, systems which allow or require voters to make intraparty choices from party lists with dozens or even hundreds of candidates may drastically alter voters' decision-making strategies by simultaneously increasing choice set size and decreasing the value of party labels as information shortcuts. As a result, although the availability of more options creates the conditions for better representation, in many cases those gains may go unrealized.

Increasing the number of parties or candidates in elections can fundamentally alter the way that voters evaluate candidates and make voting decisions. As the number of options in an election increases so too do information acquisition and processing costs. Not only does each additional candidate or party raise information costs, but if competition becomes increasingly multidimensional, information costs may increase even more rapidly. While some voters may respond to information-rich environments by continuing to invest in information acquisition and carefully evaluating their options, others may adapt their decision-making processes to the electoral environment. In some cases, this may lead voters to abstain rather than bearing the increased costs of participation (Cunow, 2012). Other voters may continue to participate but will acquire less information than they would with fewer options and may be more likely to rely on information shortcuts to make voting decisions (Aguilar et al., N.d.).

Surprisingly, the cognitive costs of the number of parties and candidates in elections have heretofore received little attention in political science, particularly in

work on institutional design (Carey and Hix, 2011). Shugart, Valdini and Suominen (2005) show that the personal vote earning attributes that candidates supply vary with district magnitude. They identify voter demands for information shortcuts as one mechanism driving this variation. In high district magnitudes, strategic voting has been shown to be unlikely (Cox, 1997). Other work has argued that in systems that require voters to rank-order all candidates, the act of voting itself may be exceedingly difficult (Taagepera and Shugart, 1989). However, little work has tested how voters’ information acquisition strategies and voting decisions vary with the number of parties and candidates. The exception is work in American politics which finds that in presidential elections, the presence of a third candidate decreases rates of correct voting (Lau and Redlawsk, 1997; Lau, Andersen and Redlawsk, 2008). Elsewhere, Lau and Redlawsk (2001) find mixed evidence of voter reliance on heuristics as the number of candidates increases – when presented with four candidate profiles rather than two, voters rely more on some heuristics but less on others.

It is especially surprising that the effects of choice set size in elections have not received more attention given the apparent sensitivity of voting decisions to myriad features of elections including candidates’ appearances, the presence of irrelevant information or the outcomes of irrelevant events (Lawson et al., 2010; Huber, Hill and Lenz, 2012; Healy, Malhotra and Mo, 2010). Moreover, in non-political contexts, choice set size has been shown to have a profound effect on choice-making. A number of experimental studies show that subjects presented with more options make poorer choices, are less satisfied with their choices, rely on easier information when making decisions, and in some cases avoid choice-making entirely. This “paradox of choice” has been identified in a variety of contexts including grocery shopping, dating, job hunting, investment decisions, and higher education (Iyengar, Wells and Schwartz, 2006; Lenton and Francesconi, 2010; Iyengar and Kamenica, 2010; Iyengar and Lepper, 2000). There is little reason to expect that political choices should not be subject to these same costs and that in elections voters would be immune to the challenges of navigating increasingly large choice sets that they face in so many other life decisions.

In this paper I test three hypotheses about the effects of choice set size on voting behavior. First, I focus on information acquisition. The costs of acquiring information about candidates' policy positions increases with the number of candidates. As a result, many voters may be unwilling to bear the costs of learning about candidates' policy positions when presented with more candidates. This may result in voters spending less time per candidate or even less time overall acquiring information about policy. In the extreme, some voters may prefer to rely entirely on non-programmatic candidate attributes as the number of candidates increases.

Hypothesis 1 *As the number of candidates increases, voters will spend less time acquiring information about candidates' policy positions.*

As the number of candidates in an election increases, voters may choose to rely on different types of information about candidates. Information shortcuts can provide voters with a means of learning about candidates without investing in more costly information about their policy positions (Lau and Redlawsk, 2001; Shugart, Valdini and Suominen, 2005). Other experimental work has shown that as the number of candidates increases, many voters are increasingly likely to rely on candidate race when voting (Aguilar et al., N.d.). As a result, as the number of candidates increases, some voters will be more likely to turn to cues about candidate quality rather than acquiring information about policy. In non-political contexts, larger choice sets have been shown to lead choosers to rely on quick and easy cues when making decisions (Lenton and Francesconi, 2010). The effectiveness of these shortcuts will vary considerably across elections. In some cases, candidate race, gender, ballot position, or other cues may be strong signals of candidate quality while in others they may be noisy, weak, or even misleading.

Hypothesis 2 *As the number of candidates increases, voters are more likely to rely on information shortcuts when making voting decisions.*

In addition to increased acquisition costs, the cognitive burden of processing information and comparing candidates or parties increases with the amount

of choice in an election. These increased processing costs combined with the acquisition of less information and greater reliance on potentially unreliable cues of candidate quality increase the probability that voters will make suboptimal or unsatisfactory choices as the number of candidates increases (Lau and Redlawsk, 1997; Lau, Andersen and Redlawsk, 2008). Correct voting should be less likely then as the number of candidates increases. The effect of choice set size on correct voting should be especially pronounced as information about policy becomes particularly costly and difficult to evaluate.

Hypothesis 3 *As the number of candidates increases, voters are less likely to vote correctly.*

The next sections of the paper describe the experimental design and web-based survey platform used to test these hypotheses.

4.3 Research Design

I employ a survey experiment to test for a relationship between the number of candidates in an election and voters' information seeking strategies and voting decisions. The survey has five stages. First, voters are asked to report their age, gender, education, income, political interest, party identification, and the state where they reside. Then, they are asked to rank twelve issue areas (corruption, crime, education, etc.) in order of their importance when selecting legislators. Respondents are then shown a set of candidate profiles and asked to cast a vote for a candidate. After voting, respondents are shown the candidate they voted for and one other candidate and asked to indicate for whom they would vote if presented with only those two options. The final stage of the survey asks respondents to indicate how realistic the candidate profiles were and to report their satisfaction with their choice, with the candidates in their district in the last election, and with the quality of democracy in their country.² All the profiles used in the experiment are of hypothetical candidates with attributes created by the author. They are described in more depth below.

²A translated survey questionnaire is available in the Appendix.

The key experimental manipulation in the survey is random variation in the number of candidate profiles with which respondents are presented. Respondents are randomly assigned to view 3, 6, or 12 candidate profiles. I leverage this variation to estimate the effect of the number of candidates on information seeking strategies and voting decisions by comparing aggregate difference in those behaviors across the three experimental conditions. For example, I compare rates of correct voting for respondents who saw three candidates to those for respondents presented with six or twelve. As is explained in more depth below, respondents' information seeking behavior and responses to the survey are recorded by the software used to administer the experiment.

An experiment is an ideal means of testing the hypotheses presented in this paper. It is nearly impossible to identify otherwise comparable elections that vary only in the number of candidates. Candidate entry is a function of institutional rules, structural factors, social cleavages, and voters' demands. As a result, the number of choices in an election varies not only with myriad factors that also impact voting behavior but may also be a function of voters' information-seeking strategies and previous voting decisions. Candidates' campaign strategies also vary with the number of other candidates in an election, making it difficult to isolate voters' responses from candidates' adaptations to different electoral contexts. In addition, accurately monitoring voters' information acquisition strategies is very challenging in an observational setting as voters may seek or be exposed to political information from any number of sources that cannot be monitored. Using an experiment, I can create variation in the number of candidates that is exogenous to candidate characteristics and voter preferences and also observe voting behavior to an extent that is not possible in an observational study.

4.4 MPH Survey Platform

The experiment described in this paper was conducted using an original web-based survey platform. This platform (henceforth MPH) allows for more precise estimates of treatment effects in survey experiments using candidate profiles.

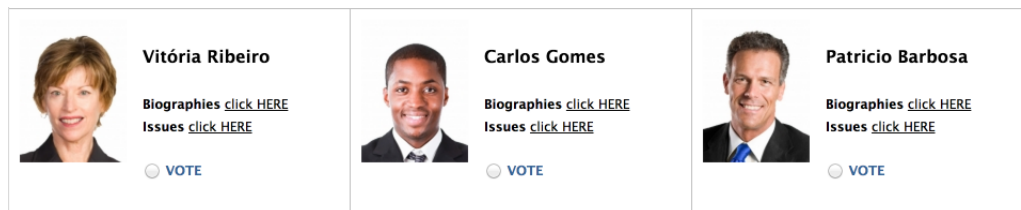


Figure 4.1: 3 Candidate Experimental Ballot

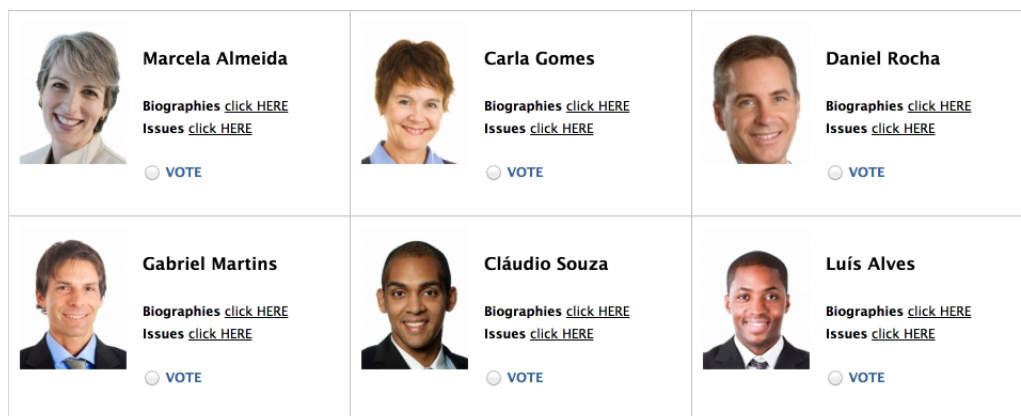


Figure 4.2: 6 Candidate Experimental Ballot

MPH fully randomizes the candidate profile generation process and thus avoids a number of potential confounds often associated with experimental stimuli. In addition, it monitors respondents' information acquisition strategies as they evaluate the candidate profiles and allows candidates' policy positions to be a function of respondents' self-reported policy preferences.

As is described above, MPH first records respondents' answers to questions about themselves and their policy preferences. It then randomly assigns respondents to view 3, 6, or 12 candidate profiles – the three experimental conditions. Sample ballots are presented in Figures 4.1, 4.2, and 4.3. Each candidate profile includes a name, a photograph, a brief biography (including information about the candidate's education, past professional experience, and family life), and policy positions on three valence issues.³

For each respondent, MPH generates a set of candidate profiles which it constructs from a pool of candidate attributes. This process works much like the

³All candidate are college-educated professionals and married with children.

 Cláudia Souza Biographies click HERE Issues click HERE ☐ VOTE	 Cristiano Correia Biographies click HERE Issues click HERE ☐ VOTE	 Vítor Ribeiro Biographies click HERE Issues click HERE ☐ VOTE
 Roberto Rodrigues Biographies click HERE Issues click HERE ☐ VOTE	 Gabriela Martins Biographies click HERE Issues click HERE ☐ VOTE	 Carlos Gomes Biographies click HERE Issues click HERE ☐ VOTE
 Luís Alves Biographies click HERE Issues click HERE ☐ VOTE	 Fernanda Dias Biographies click HERE Issues click HERE ☐ VOTE	 Daniela Rocha Biographies click HERE Issues click HERE ☐ VOTE
 Patricio Barbosa Biographies click HERE Issues click HERE ☐ VOTE	 Paulo Santos Biographies click HERE Issues click HERE ☐ VOTE	 Marcelo Almeida Biographies click HERE Issues click HERE ☐ VOTE

Figure 4.3: 12 Candidate Experimental Ballot

process of assembling a Mr. Potato Head toy. Each profile begins as a blank slate upon which the profile is built. MPH has a pool of researcher-generated candidate names, biographies, and photographs which it selects at random to build the profiles. MPH builds the first candidate profile by randomly selecting a name, photograph, personal history, and ballot position for the profile. These attributes are drawn without replacement such that after the first candidate profile is created, subsequent profiles can be created on the same ballot without names, photographs, or biographies appearing more than once for any respondent. MPH proceeds in this manner for each of the candidates until the ballot is full.⁴

MPH also randomly assigns race and gender to the candidate profiles, maintaining equal proportions of white male, black male, and white female candidates with $\frac{1}{3}$ of the candidates being of each type regardless of the number of candidates on the ballot. Gender and race are assigned by varying the photograph used in the profile. Gender is also reflected in the candidates' names (e.g. Marcelo vs. Marcela) as well as in the gender of their spouses and other grammatical changes in their biographies. The final piece of the candidate profiles is the candidates' policy positions. Each candidate is randomly assigned a combination of three policy positions, based on the respondents' self-reported policy rankings.

Full randomization of the candidate profiles has a number of benefits. First, the profile generation process makes it possible to estimate voter preferences for all attributes of the candidate profiles. This approach is similar to recent work in political science which uses conjoint analysis, a technique originally employed in work on marketing (Hainmueller, Hopkins and Yamamoto, 2012; Green, Krieger and Wind, 2001). Because all attributes are assigned to each profile with equal probability, in the aggregate any differences in the vote shares of candidates possessing different attributes can be attributed to some effect of those attributes on voting decisions.

The candidate profile generation process employed by MPH also allows for less biased estimates of treatment effects than conventional experimental approaches. When some attributes of the experimental stimuli are held constant,

⁴Unlike Mr. Potato Head, the MPH candidate profiles cannot be assembled with parts in the wrong places or upside down.

treatment effects of attributes that are varied cannot be estimated independent from the other fixed attributes with which they appear. Only by fully randomizing all aspects of the experimental stimuli can treatment effects be estimated independent of the other features of the stimuli. Full randomization thus reduces potential sources of bias from interaction effects and confounds associated with multidimensional experimental stimuli.

Finally, MPH records the candidate attributes that are viewed by each respondent such that it is possible not only to determine the attributes used in the profile selected by respondents but also which profiles were foregone. The survey platform also monitors voters' information acquisition strategies as they evaluate the candidate profiles. As is shown in Figures 4.1, 4.2, and 4.3, on each ballot respondents can click on links that open frames with information about the candidates' biographies or policy positions. Information about all candidates appears on each frame regardless of where on the ballot the link is located. A sample policy frame for six candidate profiles is shown in Figure 4.4. MPH tracks the amount of time respondents spend with the policy and biography frames open and respondents cannot proceed with the survey until these frames are closed. MPH thus makes it possible to track voters' information acquisition strategies and observe how these may vary with the number of candidates.

4.5 Case Selection and Survey Implementation

Brazilian voters were recruited to participate in the survey from a large panel of respondents maintained by a private market research firm. Approximately 4,000 voters participated in the survey between June and August, 2013.⁵ Respondents were told that they would be participating in an academic survey about political attitudes. They were compensated with "points" that can be redeemed to purchase a variety of products from the online store maintained by the market research firm. The respondents' characteristics are presented in Figure 4.5. Like other online recruitment methods, this panel provides a large, diverse sample but

⁵Voting is compulsory in Brazil for citizens between 18 and 70 years of age so the only filter used in recruitment was to select adults.

Marcela Almeida Marcela vai lutar por financiamento para a criação e promoção de produtos culturais. Marcela vai lutar para impedir a destruição do meio ambiente. Marcela vai trabalhar para criar empregos para que todos tenham a oportunidade de se sustentar.	Gabriel Martins Gabriel irá fornecer incentivos para a música, cinema e as artes. Gabriel vai melhorar a qualidade das escolas para que nossas crianças tenham uma educação melhor. Gabriel vai lutar para reduzir o desemprego e colocar as pessoas de volta ao trabalho.	Luís Alves Luís vai combater a poluição e proteger o meio ambiente. Luís vai trazer os valores da família de volta para o governo e a sociedade. Luís lutará contra o aumento dos preços para que as pessoas possam manter mais de seu dinheiro.
Vítor Ribeiro Vítor vai lutar para impedir a destruição do meio ambiente. Vítor vai trabalhar para corrigir nosso sistema de saúde e controlar os custos. Vítor combater a inflação e garantir que as pessoas consigam comprar o que precisam.	Carlos Gomes Carlos vai trabalhar no conserto do sistema de ensino e tornar as escolas melhores. Carlos vai se esforçar para proteger o meio ambiente e proteger o nosso patrimônio natural. Carlos vai dar às pessoas a oportunidade de trabalhar criando novos empregos.	Cristiana Correia Cristiana vai lutar pelos valores da família no governo e na sociedade. Cristiana vai dar às pessoas acesso a melhores cuidados de saúde a preços mais razoáveis. Cristiana vai colocar dinheiro de volta no bolso das pessoas pelo combate à inflação.

Figure 4.4: Frame with Candidates' Policy Positions

is younger, wealthier, and better-educated than the universe of Brazilian voters (Samuels and Zucco, 2014). However, if anything, these characteristics of the sample increase the likelihood that the respondents will be comfortable navigating the web-based survey interface.

Brazilian voters are ideal subjects for this experimental design for two reasons. First, Brazil's open-list proportional representation rules in legislative elections (except the Senate) and its multiparty system lead to dozens if not hundreds of candidates regularly competing in legislative elections there. Brazil's least populous states typically have 60 to 100 candidates running in statewide districts with over 1,000 running in the highest magnitude statewide district in São Paulo. Executive races can also often have up to a dozen candidates with at least a few viable ones. As a result, Brazilian voters are accustomed to navigating large choice sets when evaluating candidates and making voting decisions. Were the survey to be conducted with voters in a two party or even a less fragmented multiparty system, it is possible that any treatment effects could be attributed to voters' unfamiliarity with voting in elections with many candidates rather than the independent effect of the number of candidates on their voting behavior.

Brazilian voters are also ideal respondents for this research design because

the information environment in Brazil’s legislative elections resembles the environment in the experiment. Most legislative candidates have very little advertising time with only a few seconds to state their names and some other information about their backgrounds or policy positions (Albuquerque, Steibel and Carneiro, 2008). Newspaper coverage of legislative races is also extremely limited. As such, the amount of time respondents spend evaluating the candidates in the experiment before making voting decisions is not an unreasonable approximation of the candidate evaluation process in legislative elections for many Brazilian voters. Brazil’s legislative elections are also highly personalistic with substantial intraparty competition and party labels are insufficient for voters to make voting decisions (Samuels, 2006).⁶ This environment is also similar to the non-partisan ballots in the experiment. Finally, the valence issues presented by the candidates in the experiment are typical of the policy positions in legislative elections in Brazil. In sum, Brazilian voters are ideal subjects for this experimental design because they are accustomed to making voting decisions when faced with many candidates and the electoral environment presented in the experiment more closely resembles the environment in legislative elections in Brazil than in other systems.⁷

4.6 External Validity

As is the case with any research design, it is important to consider whether the results from this experiment would apply with another sample of voters, other ballots, or in other political systems. In particular, because the design employed in this project employs hypothetical computer-generated ballots, how can we be confident that the results would apply with real ballots and candidates?

Perhaps most importantly, most voters in the survey noticed few to no differences between the candidate profiles and those of the candidates competing

⁶Brazilian voters have an option to cast votes for party lists but very few do so (Mainwaring, 1999).

⁷As is discussed below, most respondents felt that the candidate profiles very closely resembled the profiles of the candidates running in the last election in their districts. This provides further support for the similarity of the electoral environment in the experiment to legislative elections in Brazil.

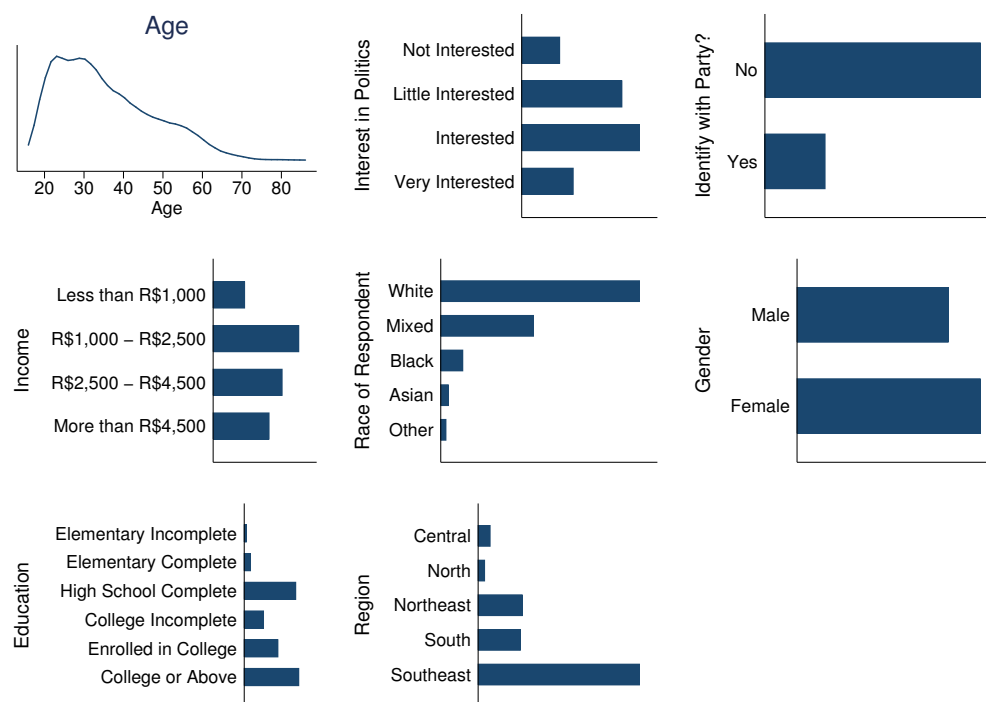


Figure 4.5: Characteristics of Survey Respondents

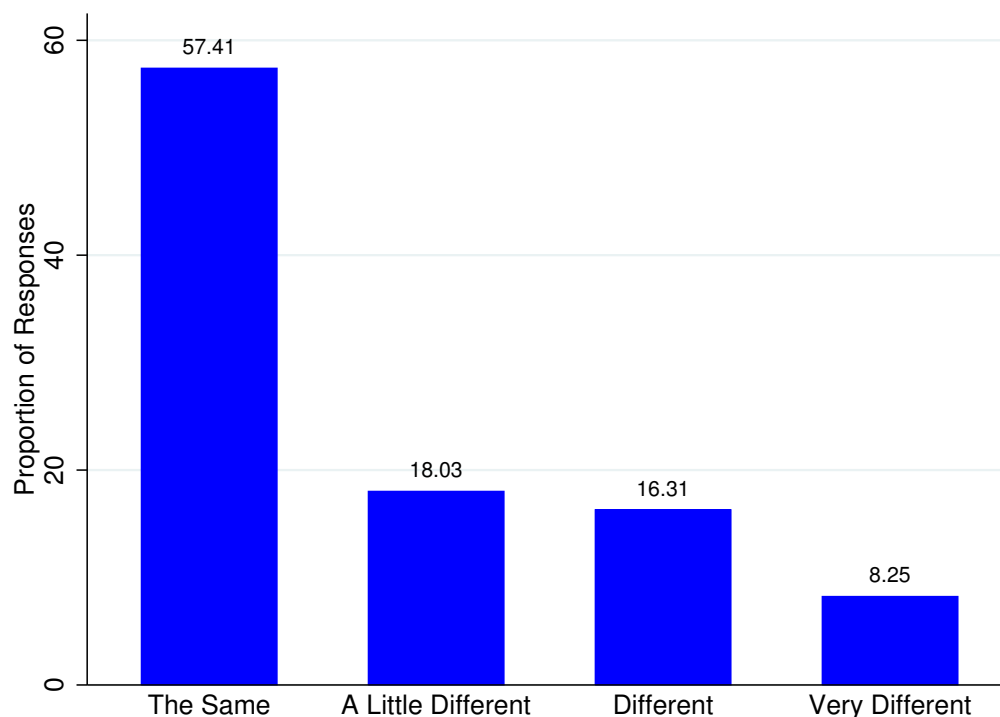


Figure 4.6: Difference between Survey Candidates and Candidates in the Last Elections

in their districts. Towards the end of the survey, after viewing the profiles and voting, subjects were asked to compare the profiles in the survey to the candidates who ran in the last election in their districts. Figure 4.6 shows responses to this question. Over 75% of respondents thought that the candidate profiles were the same or only slightly different from the candidates in the last election. Only 8.25% of respondents thought that they were very different.⁸ As such, we can be confident that the use of hypothetical profiles did not lead most voters in the survey to behave any differently than they would have had real profiles been used.

Most of the voters who participated in the survey answered the questions seriously and made decisions that were consistent with a desire to make quality

⁸In another survey experiment conducted with face-to-face interviews and using similar profiles, the author found similar perceptions of the candidate profiles. In that survey, few of the respondents who reported that the profiles were very different were able to name any specific differences. Moreover, many respondents reported being familiar with the candidates despite the profiles being fictional!

choices in the experiment. Very few respondents (less than 5%) ranked their preferred policy areas in the quickest possible fashion suggesting that the overwhelming majority attempted to complete that task in a sincere fashion. In addition, as is described in depth below, the cues employed and the choices made by most respondents in both rounds of the survey are not consistent with haphazard or reckless choice-making but rather reflect a desire to choose a quality candidate. In sum, although the stakes for any given voter in the survey were relatively low, most respondents in the survey were sufficiently motivated to take the task at hand seriously and to select quality representatives. Moreover, given the minimal financial incentives for acquiring often costly information and making quality decisions in real elections, the rewards for the subjects in the experiment are not an unreasonable representation of the incentives for voters in most elections.

4.7 Information Seeking, Shortcuts and the Number of Candidates

Before presenting the results of the experiment I briefly assess the randomization process and subjects' perceptions of the experimental stimuli. Table A.2 shows the balance of respondent characteristics across the three experimental conditions. The mean values for the covariates are very similar across experimental conditions and one-way ANOVA's do not indicate any statistically significant differences across conditions, indicating that randomization was successful.

With respect to information acquisition, increasing the number of candidates leads some voters to acquire more information about candidates' policy positions but leads a larger proportion of voters to acquire less information or to entirely avoid seeking information about policy. Figure 4.7 shows the proportion of voters who sought no information at all about the candidates' policy positions before voting. Voters who sought policy information are considered to be any voter who opened the frame containing the candidates' policy positions. This is therefore a conservative measure of information seeking in that to pursue policy information here voters needed only to open the policy frame, even for just a second. There is a

Table 4.1: Covariate Balance across Experimental Conditions

Variable	3 Candidate Mean	6 Candidate Mean	12 Candidate Mean	Prob >F
Age	35.443	35.353	35.238	0.910
Interest in Politics	2.615	2.605	2.578	0.529
Identify with Party?	0.214	0.227	0.210	0.699
Income	2.645	2.623	2.575	0.071
Gender	0.556	0.546	0.539	0.570
Education	4.469	4.441	4.360	0.208

p-values from one-way ANOVA

clear, positive, and nearly linear effect of the number of candidates on the proportion of voters ignoring the candidates' policy positions. Nearly half of the voters who were presented with twelve candidates completely avoided information about candidates' policy positions compared to approximately 37% of voters presented with three candidates, an increase of over 35%.⁹ As is discussed in more depth later, this result fits well with work that shows that candidate-centered elections will grow more personalistic as the number of candidates increases (Carey and Shugart, 1995).

If increasing the number of candidates leads many voters to acquire less or no information about candidates' policy positions, how do those voters make voting decisions? As predicted in Hypothesis 2, some voters are increasingly likely to rely on potentially unreliable cues of candidate quality. Figure 4.8 shows the vote share of the candidates in the experiment by ballot position. As is explained above, ballot order is randomly assigned to the profiles as they are generated for each respondent. As such, absent any preference for particular ballot positions, the candidates' vote shares should be equal across all ballot positions; this null hypothesis is represented by the dotted lines in the plot.

⁹As might be expected, regardless of the number of candidates, some voters are uninterested in acquiring information about candidates' policy positions.

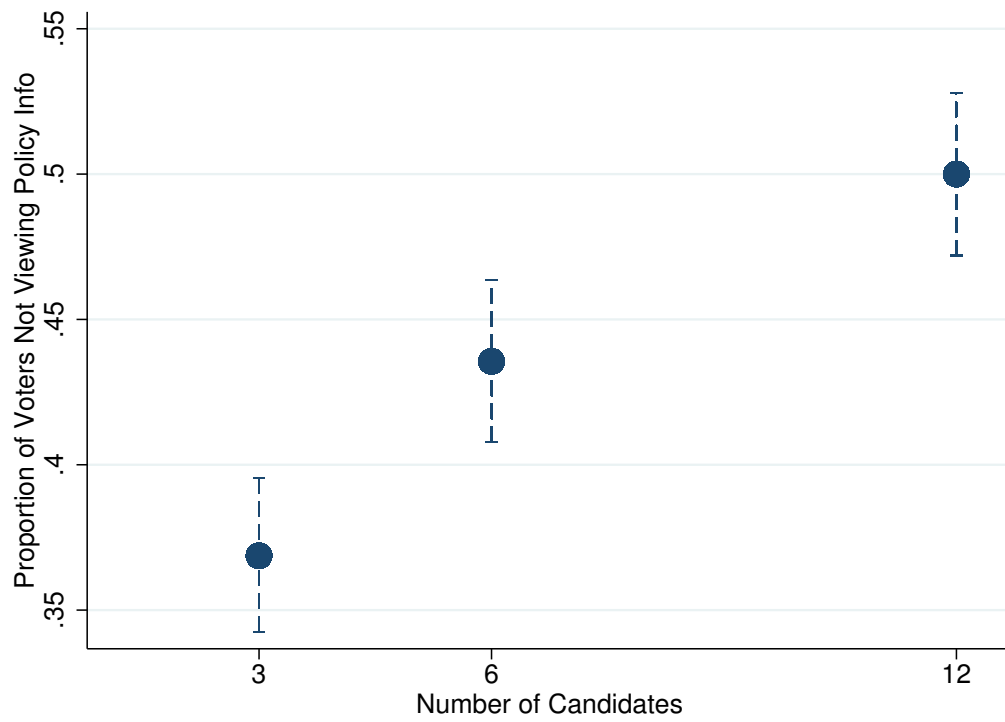


Figure 4.7: Proportion of Voters Ignoring Candidates' Policy Positions

Sample means with 95% confidence intervals

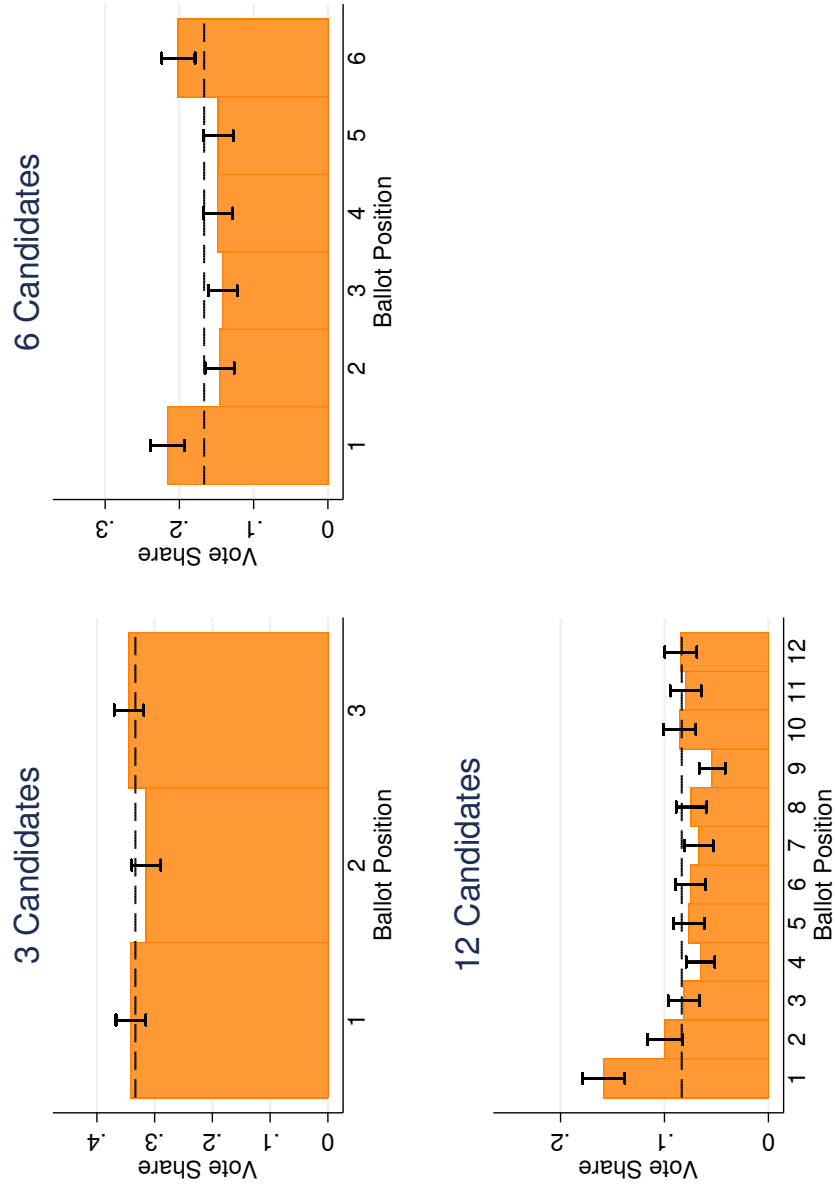


Figure 4.8: Vote Share by Ballot Position and Number of Candidates

Sample means with 95% confidence intervals

Dotted line represents H_0

Figure 4.8 shows that with three candidates there are no significant ballot order effects. With six and twelve candidates however, there is a significant preference for candidates in certain ballot positions – the first position and last positions with six candidates and the first and second positions with twelve candidates. As the number of candidates increases, some voters are more likely to rely on at least one information shortcut – ballot position – when making voting decisions. In some elections ballot position might be a meaningful signal of candidate quality if parties place their strongest candidates at the top of the ballot. In this experiment, however, it is randomly assigned and is therefore a meaningless signal of candidate quality. Here, voters employing this shortcut will find a good representative no more often than if they voted at random.

When presented with more candidates, many voters also sought to make vote choice less difficult by reducing the dimensionality of the issue space. Figure 4.9 shows the proportion of voters who pursued at least some information about candidates’ policy positions and voted for a candidate who presented a valence position on the voters’ (self-reported) most important issue. This proportion is shown relative to the null hypothesis which is the proportion of voters who would vote for such candidates if they voted at random.¹⁰ Figure 4.9 shows that the proportion of voters “first issue hunting” when presented with three candidates is not statistically different from the null hypothesis. With six and twelve candidates however, there are significantly more “first issue hunters” than would be expected based on the null hypothesis. In response to increases in the dimensionality of the policy space as the number of candidates increases, many voters in the experiment sought to simplify the choice-making process by reducing the dimensionality of the issue space and hunting for their most important issue. This strategy reduces information costs but may mean losing one of the most important benefits of elections with more candidates – a higher dimension policy space – depending on the distribution of policy preferences in the election.

¹⁰This random baseline is higher for respondents who saw fewer candidates because of the distribution of policies among candidates in the experiment. In each condition only two candidates would represent a voter’s most important issue. This meant 2 of 3, 2 of 6, and 2 of 12 candidates for the three, six, and twelve candidate conditions respectively.

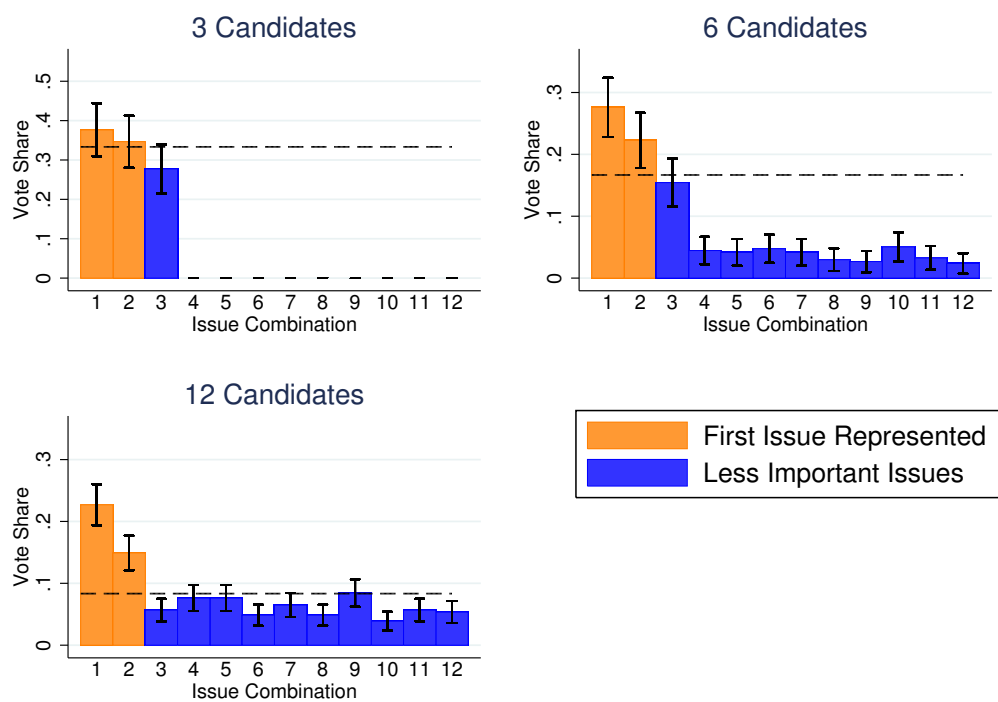


Figure 4.9: “First Issue Hunting” Relative to Random Voting Baseline

Sample means with 95% confidence intervals

Dotted line represents H_0

4.8 Correct Voting and the Number of Candidates

The information acquisition and dimension reducing strategies adopted by voters suggests that increasing the number of candidates has heterogeneous effects for different types of voters. Some voters take advantage of environments with more information and policy choices, others avoid policy altogether when presented with more candidates, and still others find a middle ground by relying on information shortcuts and seeking to reduce the complexity of the issue space. The next logical question is whether the changes in voters' information seeking and candidate evaluation strategies lead them to make poor voting decisions.

After selecting a candidate in the survey, respondents are asked to indicate a preference for one of two candidates – the candidate for whom they voted and one additional candidate from the ballot. Voters' choices in this second round can be used to determine if they voted correctly in the first round. Following Lau and Redlawsk (1997) and Lau, Andersen and Redlawsk (2008), voters who opt to discard their candidate in favor of another candidate are considered to have voted incorrectly in the first round. By discarding their original choice, voters indicate that they did not vote correctly and that they in fact prefer another candidate from the ballot.

Figure 4.10 shows the proportion of voters discarding their original candidate in the second round. Perhaps not surprisingly, the proportion of voters doing so is quite low with three candidates. As the number of candidates increases however, there is a significant and substantial impact on the proportion of voters changing candidates. This provides strong support for Hypothesis 3 – increasing the number of candidates increases rates of incorrect voting by this measure. Moreover, this measure is likely a conservative estimate of incorrect voting because endowment effects decrease the probability that voters will discard their original choice (Thaler, 1980). As a result, the nearly 20% of voters who voted incorrectly when presented with twelve candidates may in fact be an underestimate of the number of voting errors.

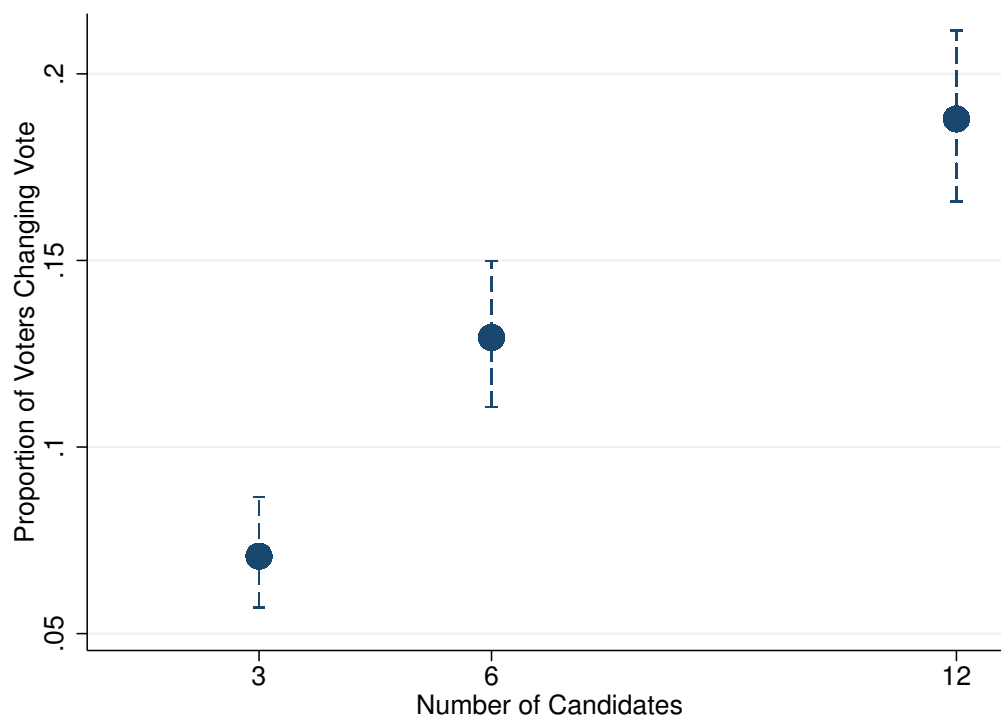


Figure 4.10: Proportion of Voters Changing Candidates by Number of Candidates

Sample means with 95% confidence intervals

Are voters who discard their chosen candidates doing so haphazardly or does their decision to select a new candidate in fact reflect a poor initial decision and a desire to find a candidate whom they prefer? In order to determine whether or not voters select candidates who are a better fit for their preferences than their original choices, I employ a new measure of correct policy voting. I define a correct vote as a vote for a candidate whose policy positions are not strictly dominated by another candidate's.

Each of the candidate profiles in the survey includes policy positions in three of twelve issues areas. The issues represented by each candidate are a function of respondents' self-reported policy preferences. As is explained above, prior to viewing the candidate profiles, respondents are asked to rank policy areas in order of importance to them when selecting a legislator. Based on these rankings, I derive an objective measure of the quality of the fit between candidates' policy positions and voters' policy preferences. Some candidates are assigned objectively "correct" combinations of policy positions that strictly dominate other candidates' policy positions.

The logic of this new measure of correct policy voting is presented in Table 4.2. Here, Candidate 1 is assigned policy positions in the issue areas that are of 1st, 2nd, and 11th greatest importance to the respondent. Candidate 2 represents the 2nd, 3rd, and 11th most important issue areas. All candidates in the experiment take "valence" positions on these issues – rather than proposing a solution to a particular problem they advocate for an outcome that all voters support (less corruption, better schools, less crime, more jobs, etc.). If we assume that voters are indifferent between two candidates' positions on the same valence issue and that voters' utilities from each valence position are independent from one another, Candidate 1's issue positions strictly dominate those of Candidate 2. I therefore consider a vote for Candidate 1 to be a correct policy vote and a vote for Candidate 2 to be an incorrect policy vote. This measure can be used to evaluate the quality of the fit between voters' policy preferences and the policy positions of the candidates they select in the experiment.¹¹

¹¹A more formal discussion and proof of this correct voting measure are provided in the Appendix.

Table 4.2: Correct Policy Voting

Correct Vote	Incorrect Vote
Candidate 1	Candidate 2
1	1
2	3
11	11

This measure of correct voting has two main benefits. First and most importantly, it is an entirely objective evaluation of the quality of voting decisions that requires no scaling of voters' responses or coding of candidates' policy positions. Previous work has relied on measures of correct voting based on scaling and weighting of voters' self-reported policy preferences and the policy positions presented by candidates (Lau and Redlawsk, 1997, 2001). Second, this measure does not require that voters answer challenging questions about their ideology or policy preferences. It only requires that voters rank policy areas in order of importance to them.

Figure 4.11 shows the correct policy voting measure applied to voters' second round vote choices. By this measure, voters who discard their original candidates in the second round are very likely to do so in favor of candidates whose policy positions are a better fit for their policy preferences.¹² This provides support for the validity of the second round vote choice as a measure of correct voting in the first round. Voters who opt to change their votes are likely to do so in pursuit of better policy representation. This result also suggests that choosing between two candidates may be considerably easier than voting in a multi-candidate election, a finding that echoes work on correct voting in U.S. presidential elections (Lau and Redlawsk, 1997; Lau, Andersen and Redlawsk, 2008).

¹²Because of their first round choices, some voters did not have the opportunity to select a correct candidate in the second round of the experiment and are therefore excluded from Figure 4.11.

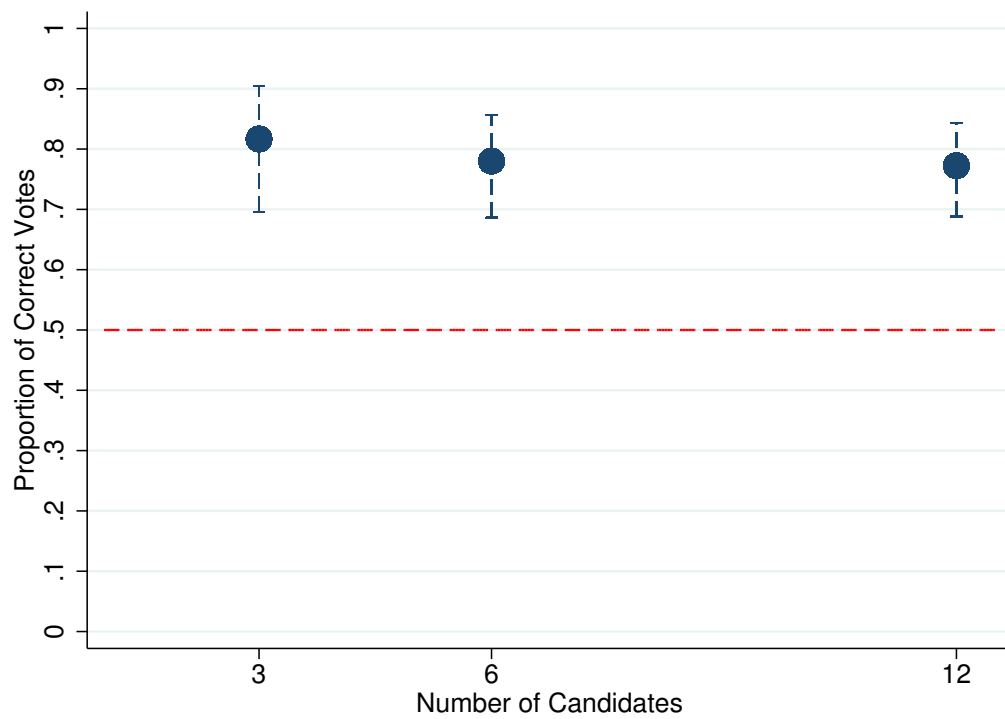


Figure 4.11: Correct Policy Voting in 2nd Round for Voters Who Change Candidates

Sample means with 95% confidence intervals

Dotted line represents probability of correct policy vote if respondents vote randomly

4.9 Voter Satisfaction and the Number of Candidates

Providing voters with more choice in elections may also affect their satisfaction with their choices and with the democratic process. If increasing the number of candidates makes it more likely that a “good fit” will be available most voters, voter satisfaction may increase with the number of candidates. If, as the literature on institutional design predicts, increasing the number of candidates can improve representation, voter satisfaction may increase with the number of choices in an election. On the other hand, increasing choice set size in non-political decisions has been linked to decreased satisfaction as choosers grow overwhelmed and those more prone to regret are frustrated by a growing number of alternatives (Iyengar, Wells and Schwartz, 2006; Schwartz et al., 2002). This dissatisfaction may be limited to the candidates or election at hand or may have broader consequences for voters’ acceptance of electoral processes and democratic institutions.

In order to test for a relationship between the number of candidates and voter satisfaction, the final three questions of the survey asked voters how satisfied they were with their choice in the survey, with the way democracy works in their country, and with the candidates who ran in their districts in the last election. Figure 4.12 presents the mean responses to these questions. Voters who were presented with more candidates were slightly more satisfied with their choices and with the candidates in the last election. There was no significant effect of the number of candidates in the experiment on voters’ satisfaction with democracy, possibly because the strength of the treatment in the survey was weak relative to subjects’ feelings about democracy.

These results suggest that providing voters with more choices in elections may improve their satisfaction with their choices, even if it does not necessarily improve the quality of representation. Like voting behavior, the effects of choice set size on voter satisfaction may be heterogeneous across voter types. As has been found in other experimental work, some voters may seek to maximize the quality of their representatives regardless of the number of candidates and may find greater

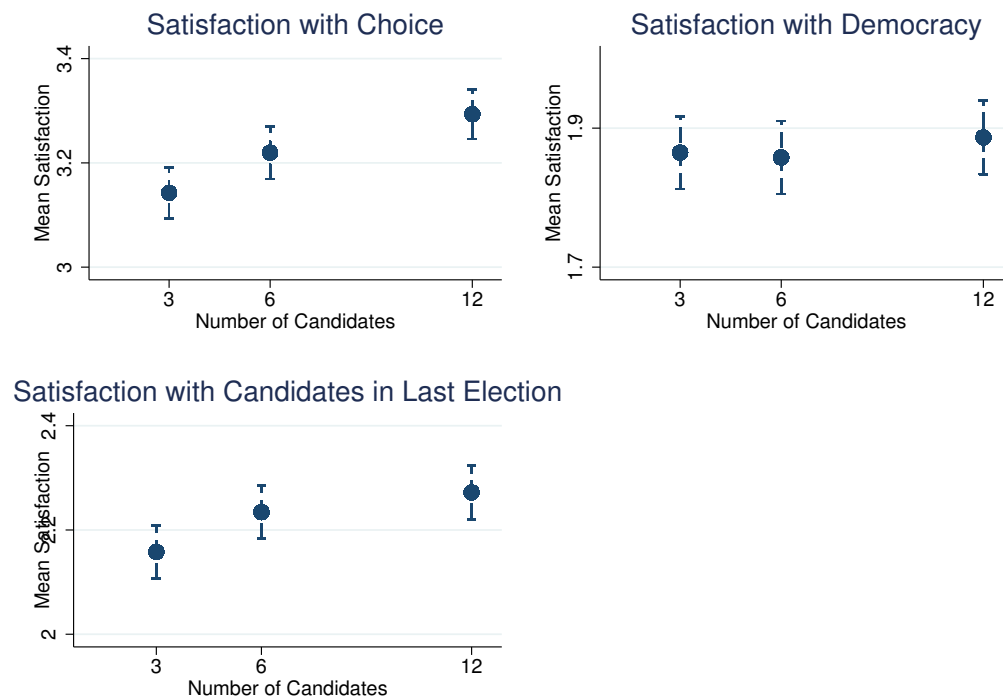


Figure 4.12: Voter Satisfaction by Number of Candidates

Sample means with 95% confidence intervals

variety to be frustrating (Schwartz et al., 2002). A larger proportion however, may satisfice by avoiding costly information about policy positions and instead relying on quicker and easier cues of candidate quality. For the those voters, more choice may mean less frustration and more satisfaction as they adopt easier solutions to increasingly complex environments.

4.10 Discussion

Voters' information-seeking and decision-making strategies vary considerably with the electoral environment. Even very moderate increases in the number of choices in an election can profoundly alter how many voters evaluate candidates and select representatives. As a result, more proportional systems that seek to improve representation by allowing for more party and candidate entry may have heretofore unanticipated consequences. Rather than leading voters to seek representatives who are a closer fit for their policy preferences, increasing the size of the electoral choice set can lead many voters to avoid acquiring information about policy altogether. The information costs of increasing the number of candidates may lead other voters to first issue hunt or otherwise reduce the dimensionality of the issue space.

One of the primary benefits of more proportional electoral systems is that they will tend to lead to a wider range of policies and policy positions represented in elections. This benefit is lost on voters who ignore information about candidates' policy positions, first issue hunt, or otherwise seek to simplify their choices by reducing the complexity of the policy space. In the experiment presented in this paper, these effects begin to appear even when increasing the number of candidates from three to six. These results suggest that scholars of elections and electoral institutions should carefully consider how voters adapt to more choice in elections and how changes in information acquisition strategies and voting behavior affect the functioning of electoral systems. These voter responses may dramatically alter the nature of elections and inhibit the translation of more representative elections into better representation.

The results presented in this paper also have a number of implications for candidate and party strategy. The dimensionality of the policy space in the experiment is exogenous to voters' demands and information-seeking behavior. However, in most elections the types of candidates who enter competition and the types of information emphasized in campaigns are in part a function of voters' demands and information-seeking behavior. The results presented in this paper suggest that in electoral systems with more parties and candidates, policy positions may be deemphasized relative to information that is quicker and easier to acquire for voters facing more than just a few choices. Thus, in addition to the incentives created by intraparty competition and localism (Carey and Shugart, 1995; Shugart, Valdini and Suominen, 2005), the sheer number of options in an election may lead politics to be more personalistic or pork-centered because of voter demands for quicker and easier information about their options.

This paper provides evidence of the effects of increasing the number of candidates on Brazilian voters who are accustomed to navigating large choice sets in elections. Future work on the effects of choice set size on voting behavior should seek to explore how these effects vary across political systems. How do voters accustomed to fewer candidates and parties in elections respond to more choice? How does the presence of party labels alter voters' information acquisition strategies and voting decisions? How are voters affected in systems in which they vote for parties rather than candidates? Future work could also explore a wider range of choice set sizes to better explore the trade-off between representativeness and the cognitive burdens elections create for voters.

Another promising avenue for future research would be to explore which types of voters are most likely to thrive or to find voting challenging as the number of options increases. One useful framework might be the distinction between maximizers and satisficers and how those personality types hinder or facilitate choice-making (Schwartz et al., 2002). Future work might also examine how campaign content and coverage vary with the number of choices in an election and how they may hinder or facilitate vote choice. Institutional reforms may be effective in limiting candidate entry in elections but are rare because they are unlikely to

be approved by politicians elected under existing configurations. Instead, changes to the way that information is delivered and presented to voters in elections (both by the media and campaigns) may provide considerable benefits for voters while being easier to implement.

Finally, the measure of correct voting and the candidate profile generation process introduced in this paper may be useful tools for future research in this area. The logic of strict dominance employed in the correct policy voting measure can be applied to a wide range of choice experiments in which it is normally difficult to objectively assess the quality of choices. Future work could seek to vary the distribution of policy positions in a similar experiment. Like some recent work in political science using conjoint analysis (Hainmueller, Hopkins and Yamamoto, 2012), the complete randomization of the experimental stimuli employed in this experiment is also a promising means of improving causal inference in future experimental work.

Chapter 4 has been submitted for publication in the *American Journal of Political Science*. The dissertation author was the primary investigator and author of this paper.

Chapter 5

Conclusion

This dissertation addresses the effects of electoral complexity for voters and how voter responses to complexity affect the quality of representation. I identify a trade-off between more representative elections and the cognitive burdens created by longer ballots. My empirical analysis highlights a variety of voter responses to the number of choices available to them in elections. As the number of parties and candidates in competition increases, I find that many voters are less likely to participate and learn about candidates' policy positions and more likely to rely on information shortcuts and make voting errors. The analysis focuses on Brazilian municipal elections and Brazilian voters but has implications for virtually all elections and electoral systems.

In Chapter 2, I present the empirical results that initially motivated the dissertation. I show that the availability of more options is negatively related to participation rates in Brazilian municipal elections. I argue that this result likely underestimates the actual deterrent effect of choice set size on participation for many voters. My results highlight a significant net negative relationship in which the proportion of voters motivated to choose as electoral complexity increases is outweighed by the proportion of voters for whom more choice deters participation. I propose that this may lead to a distorting effect of complexity on the effective composition of the electorate and that this distortion may negatively impact the prospects for quality representation for many voters.

Chapter 3 introduces an experimental approach to studying the microfoun-

dations of voter responses to electoral complexity. By randomly varying ballot size, I can isolate the effect of the number of candidates on abstention rates. I find strong support for the results presented in Chapter 2. Voters presented with longer ballots were significantly less likely to participate than those presented with fewer, even when information about candidates' party affiliations is made available to them.

I extend the analysis to focus on the consequences of complexity for voters' information acquisition strategies and the quality of their voting decisions in Chapter 4. Using a second survey experiment, I manipulate both ballot length and the candidates' attributes and policy positions while monitoring the information voters acquire about their options. Even for those voters who are not deterred by electoral complexity, variations in the number of options on the ballot can have substantial effects on their decision-making strategies. When presented with more candidates, many voters learn *less* about their options, rely on potentially unreliable cues of candidate quality, and make poor decisions. Thus, in addition to voters who become detached from electoral politics as elections become more complex, even many voters who remain engaged are negatively impacted.

This dissertation represents the beginning of a research agenda that I will continue to pursue. I view three broad avenues of research stemming from this project. The first is to identify the scope conditions for the effects of choice set size on voting behavior identified in the dissertation. The microfoundations of voter responses to electoral complexity are a second avenue for future exploration. The third question deals with the effects of electoral complexity on the quality of representation and government performance.

The first avenue for research is to explore the scope conditions for the results presented in the dissertation and to identify the conditions under which voters will be willing and able to make good choices in complex electoral environments. The role of parties in facilitating choice-making is of particular interest. Although Chapter 3 explores the role of information about candidates' party affiliations in facilitating choice-making, more work needs to be done on voter responses to longer ballots in stronger party systems and systems which enhance the role of parties or

require voters to cast votes for parties rather than individual candidates. Where party labels have greater information content, choosing from a ballot with six parties may be very different (and likely easier) than choosing from a ballot with six candidates. However, even in such systems, choosing from six parties should be different from choosing from two or twelve. In other words, I expect that choice set size will continue to be influential but may lead voters to respond differently than in systems where parties matter less. Further experiments or analysis of electoral returns in more party-centric systems would address some of these questions and additional experiments with party ballots would be especially interesting.

A second question of scope is how the measure of correct voting introduced in Chapter 4 performs with a different distribution of policy positions and in a spatial, rather than a valence environment. As is discussed in Chapter 4 and the Appendix, policy positions were distributed to candidates in the experiment in such a way as to avoid biasing the aggregate correct policy voting results. However, this distribution may not accurately effect the policy space in many political systems in which, as the number of candidates increases, the probability of making a “good” or satisfactory policy choice decreases with the number of candidates. In other words, the bar in Chapter 4 is set too high. Future experimental work could examine the effects of choice set size on voting behavior and correct voting with a different and more challenging distribution of policies.

More generally, correct voting is more difficult in a spatial setting than in the valence environment in Brazilian municipal elections and in my experiment in Chapter 4.¹ Future experiments and observational work could look at different types of policy spaces and whether the effects of choice set size are magnified or reduced in environments with clearer ideological spaces relative to valence settings of the type explored in the dissertation.

Another logical avenue for future research is to further explore the micro-foundations of the paradox of choice in elections. In Chapter 2, I discuss the potential distortion of the electorate that may result from individual-level variations in responses to increasing choice set size. In Chapter 4, I identify heterogeneity

¹In the abstention experiment in Chapter 3 the candidates are assigned ideological positions but I have no means of measuring correct voting.

in voter responses to larger ballots. When presented with more candidates, some voters learn more about their options, others learn less, some rely on shortcuts, and others entirely abandon the pursuit of information about their options. But what determines which voters struggle with large choice sets more than others? My results in Chapter 4 suggest that standard socioeconomic and political interest variables do not explain this variation.

One possibility for future research would be to attempt to identify individual determinants of responses to choice set size. This can be accomplished with laboratory or survey experiments, or more abstract experiments in which voters can be incentivized to make good choices and their personality or other traits can be measured using standard batteries of questions. These microfoundations are important for understanding how elections and electoral systems affect the composition of the electorate, which voters have their preferences represented by elected bodies and policy outcomes, and which voters are left poorly represented or disengaged from the political process.

The results presented in this dissertation have a number of important implications for the quality of representation. If more representative elections leave some voters out of the political process or lead others to make poor choices, elected bodies will do a poor job providing citizens with representation. However, the quality of representation and policy outputs are largely absent from the experiments presented here. Instead, I focus on inputs and assume that voters who do not participate in elections or make poor choices are at risk of not being adequately represented. The question of how collective representation is affected by individual responses to more representative elections could be addressed with some simulated elections or by identifying suitable outputs that can be measured at the district level and matched with information about electoral complexity.

Finally, returning to the original motivation for the dissertation, another avenue for research would be to look at the candidate attributes that are valued by voters in complex electoral environments. In some co-authored work, I use data from my experiments to examine the role of candidate race and gender in voting decisions and how voter reliance on those attributes may vary with the number

of candidates on the ballot (Aguilar et al., N.d.; Aguilar, Cunow and Desposato, 2013). The conjoint approach employed by the survey software introduced in Chapter 4 would be particularly useful in addressing these questions. By fully randomizing the set of candidate attributes, we can estimate voter reliance on any of those attributes when making voting decisions. In other words, we can estimate *how* voters make decisions, typically a challenging question to answer.

Future work could look at how voters in complex electoral environments rely on various candidate attributes when making voting decisions and how that reliance impacts the quality of the representatives who are elected to office and the ability of voters to hold them accountable. Incumbency advantage and clientelistic connections are two candidate attributes that may be especially useful for voters as elections become more complex and which may impact the fit between voters and representatives and the ability of voters to hold their representatives accountable.

Appendix A

Chapter 3

Table A.1: Summary Statistics for Variables Used in Regression Models

	count	mean	sd	min	max
Abstain	1122	0.326	0.469	0	1
Party Labels	1122	0.501	0.500	0	1
Education	1122	2.947	0.768	1	4
Income	1122	2.853	0.939	1	4
Political Interest	1122	2.200	0.903	1	4
Female	1122	0.511	0.500	0	1
Party ID	1122	0.461	0.499	0	1
Age	1122	33.004	12.659	18	78
Number of Candidates	1122	5.653	3.859	2	12
2 Candidates	1122	0.253	0.435	0	1
3 Candidates	1122	0.258	0.437	0	1
6 Candidates	1122	0.250	0.433	0	1
12 Candidates	1122	0.240	0.427	0	1
Careful Choice	1122	0.676	0.468	0	1
Observations	1122				

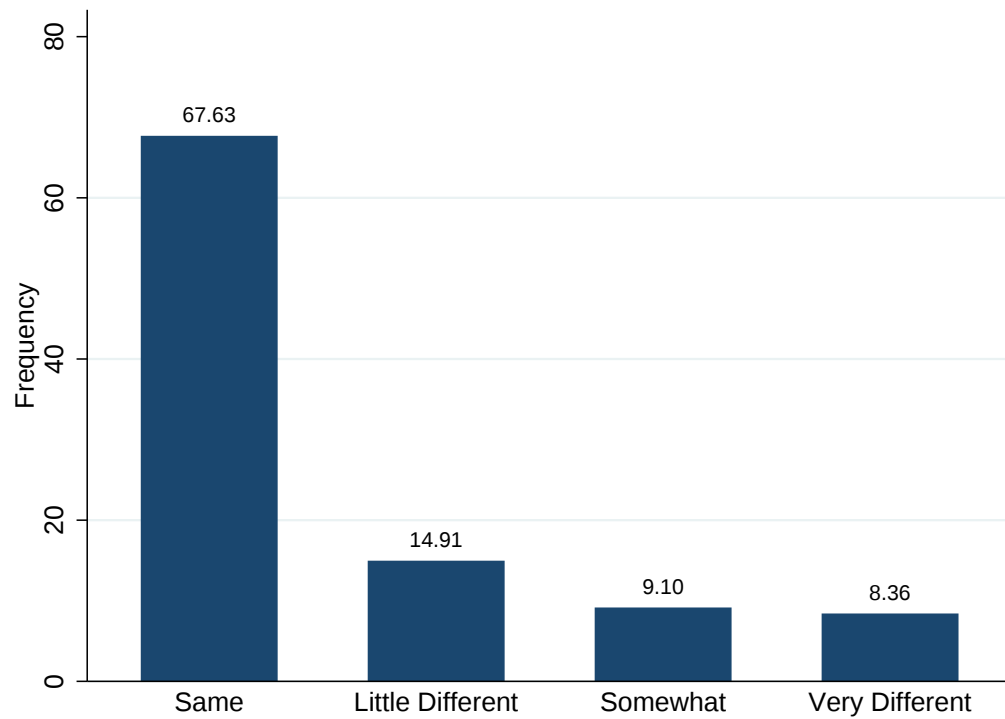


Figure A.1: How Different are Survey Candidates and Candidates in Last Election?

Table A.2: Covariate Balance across Experimental Conditions

	Education	Political Interest	Income	Age	Party Id	Female
2 Candidate No Party Mean	2.946	2.140	2.805	32.403	0.387	0.524
2 Candidate Party Mean	2.959	2.187	2.892	33.228	0.470	0.517
3 Candidate No Party Mean	2.822	2.146	2.752	33.753	0.434	0.490
3 Candidate Party Mean	3.054	2.295	3.047	31.537	0.454	0.507
6 Candidate No Party Mean	2.889	2.188	2.844	34.119	0.472	0.543
6 Candidate Party Mean	2.867	2.072	2.593	32.816	0.552	0.540
12 Candidate No Party Mean	3.000	2.299	3.021	31.646	0.424	0.489
12 Candidate Party Mean	2.978	2.230	2.892	35.143	0.454	0.511
Prob >F	0.180	0.355	0.001	0.214	0.199	0.977

p-values from one-way ANOVA

Appendix B

Chapter 4

B.1 Correct Policy Voting

In this paper I introduce and employ a new measure of correct policy voting. I define a correct vote as a vote for any candidate whose policy positions are not strictly dominated by any other candidate's. As I illustrate in detail below, voters who cast a vote for a candidate whose policy positions are strictly dominated by another candidate's are voting incorrectly, at least with respect to policy. Dominance is determined based on voters' self-reported policy preferences.

Table B.1 shows the twelve combinations of issue positions that are randomly assigned to the candidates in the survey. The issues represented by each candidate are a function of the issue ranking provided by respondents prior to viewing the candidate profiles. The numbers in Table B.1 are based on the importance voters assign to each policy area in decreasing order such that 1 is a voter's most important policy area and 11 is the least important. For example, Candidate 1 presents a policy position on the respondent's 1st, 2nd, and 11th most important issues. Each candidate presents a policy position on three issues and all candidates take "valence" positions on these issues. I assume that voters are indifferent between two candidates' positions on the same valence issue as all candidates presenting policies on the same issues are advocating for the same outcome (albeit using slightly different randomly assigned language) without any specific policy prescriptions.

Table B.1 presents the candidates' issue positions in the same groups of three candidates in which they are presented to voters. Within each group, the candidate in the first column of the table strictly dominates the other two candidates. For example, in the first group of three candidates, the policies of Candidate 1 strictly dominate those of Candidate 2 and Candidate 3. The following example illustrates the logic of strict dominance using iterated deletion:

Do the policies of Candidate 1 strictly dominate the policies of Candidate 2?

$$U_i(\text{Candidate 1}) \stackrel{?}{>} U_i(\text{Candidate 2})$$

Assume that voter i 's utility from the candidates' policies is the sum of the utility from each individual policy.

$$U_i(\text{Issue 1}) + U_i(\text{Issue 2}) + U_i(\text{Issue 11}) \stackrel{?}{>} U_i(\text{Issue 1}) + U_i(\text{Issue 3}) + U_i(\text{Issue 11})$$

Both candidates present the same positions on Issues 1 and 11. Using iterated deletion, voter i can ignore those issues when determining which candidate's policies are preferable because voter i is indifferent between the candidates' valence positions on those issues.

$$\cancel{U_i(\text{Issue 1})} + U_i(\text{Issue 2}) + \cancel{U_i(\text{Issue 11})} \stackrel{?}{>} \cancel{U_i(\text{Issue 1})} + U_i(\text{Issue 3}) + \cancel{U_i(\text{Issue 11})}$$

Based on voter i 's self-reported policy preferences, she derives greater utility from Issue 2 than from Issue 3.

$$U_i(\text{Issue 2}) > U_i(\text{Issue 3})$$

Therefore, for voter i , the policies of Candidate 1 strictly dominate the policies of Candidate 2.

$$U_i(\text{Candidate 1}) > U_i(\text{Candidate 2})$$

Given this strict dominance of Candidate 1's policy positions over Candi-

date 2's policy positions, I assume that a vote for Candidate 1 is a "correct" policy vote. Similarly, Candidate 3's policies are strictly dominated both by the policies of Candidate 1 and Candidate 2. The same logic of iterated deletion of equivalent policy positions can be applied to show that Candidate 2 strictly dominates Candidate 3. As such, a vote for Candidate 2 or 3 should be considered an "incorrect" policy vote and a vote for Candidate 3 is "doubly incorrect" in that there are two other candidates whose policies strictly dominate the policies of Candidate 3. Any voter can achieve improved policy representation by voting for Candidate 1 compared to Candidates 2 or 3. Candidate 1 is therefore the only correct policy vote in this group of candidates while Candidate 3 is objectively the worst choice.

In each group of three candidates, one candidate strictly dominates the other two and one candidate's policies are "doubly" dominated by both of the other two candidates' policies.

$$U_i(\text{Candidate 1}) > U_i(\text{Candidate 2}) > U_i(\text{Candidate 3})$$

$$U_i(\text{Candidate 4}) > U_i(\text{Candidate 5}) > U_i(\text{Candidate 6})$$

$$U_i(\text{Candidate 7}) > U_i(\text{Candidate 8}) > U_i(\text{Candidate 9})$$

$$U_i(\text{Candidate 10}) > U_i(\text{Candidate 11}) > U_i(\text{Candidate 12})$$

This logic of strict dominance applies to candidates within groups but not across groups. Within any of the four groups of three candidates, one candidate strictly dominates the other two and one candidate is "doubly" dominated. Across groups however, none of the four dominant candidates is dominated by any other candidate.

As a result of this ambiguity across groups, regardless of the number of candidates (3, 6, or 12), the probability of a correct vote is always $\frac{1}{3}$ and the probability of an incorrect vote is always $\frac{2}{3}$. In other words, there may be a "best" candidate for each voter but from the information provided by the voters in the survey, we cannot determine which candidate that is. I thus hold voters to a lower standard whereby correct voting is defined only as voting for a candidate whose policy po-

Table B.1: Candidate Issue Positions

Group “A”	“Correct” Vote	Strictly Dominated	
	Candidate 1	Candidate 2	Candidate 3
	1	1	2
	2	3	3
	11	11	11

Group “B”	“Correct” Vote	Strictly Dominated	
	Candidate 4	Candidate 5	Candidate 6
	2	2	3
	3	4	4
	10	10	10

Group “C”	“Correct” Vote	Strictly Dominated	
	Candidate 7	Candidate 8	Candidate 9
	3	3	4
	4	5	5
	9	9	9

Group “D”	“Correct” Vote	Strictly Dominated	
	Candidate 10	Candidate 11	Candidate 12
	5	5	6
	6	7	7
	8	8	8

First column candidates strictly dominate others

sitions are not strictly dominated by another candidate’s. With more than three candidates, one or more of the “correct” candidates may not be the best candidate for a voter but would still be coded as a “correct” vote.¹ It is also worth noting that although voters are asked to rank twelve issues, it is only necessary that they correctly rank at most their seven most important issues for this measure of correct voting to apply.²

¹With three candidates, there is only one correct candidate who represents the best available policy representative for each voter.

²The other issues are only used to maintain independence across groups of candidates and an equal probability of correct voting across experimental conditions.

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