Party Competition Dimensionality and Voter Heuristic Use

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Draft Version, all comments welcome!

HOLGER REINERMANN*

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Abstract

Voters have different mechanisms to choose among parties, such as personalistic, retrospective or programmatic voting. Within the last, the most prominent device they use to make sense of politics arguably is the left-right scheme. But an important underlying assumption for that is that parties conform to this unidimensional conception of politics. Empirically however, the way parties differentiate varies in dimensionality. What happens if the issues that parties compete over correlate in higher order? Several accounts suggest that it is doubtful whether voters engage in decision environments that complex. This paper engages this puzzle by directly modeling how voters aggregate issues into party rankings. Assuming that voters switch heuristics if these rankings do not provide a sufficiently strong signal, it develops hypotheses on how greater issue diversity in party competition influences voter heuristic use. These hypotheses are then tested in a cross-nationally comparative analysis combining survey with manifesto data.

1 Introduction

Established accounts of research, contingent on whether their focus is on party competition on the one hand or on voter behavior on the other, exhibit a striking divergence with regard to how voters tend to be modeled. While the one pictures rational, goal-directed maximizers with a working knowledge of both calculus and geometry, the other sees the voter as a bit of a simpleton, with only the most basic notion of (and hardly any interest in) politics, basing decisions on random affections and whims.

This relates to very distinct views of how parties compete for voters: On the one hand, examining how voters who purportedly possess only sparse political knowledge, and even less motivation to change that, make political decisions, voter behavior research usually employs rather simple models of political competition with one dimension of political ideology. On the other hand, having found that political discourse in reality is much more diverse, party competition research frequently ends up with two, three or even more dimensions and accordingly posits much more discerning voters.

This slightly hyperbolic summary of course does neither of the respective subdisciplines justice. However, one aspect remains puzzling: On the one hand, it is widely argued that campaign messages of political parties are too crudely mapped on a single

*SOCLIFE Research Training Group and Cologne Center for Comparative Politics, University of Cologne [reinermann@wiso.uni-koeln.de]. An earlier version of this work was presented at the CCCP Research Seminar. I also thank André Kaiser, Clemens Kroneberg, and Will Lowe for valuable comments.
dimension. On the other hand, this is the very linkage that is usually assumed when it comes to how voters decide which of these messages has the most ring to it. In this paper, I try to systematize this puzzlement by asking whether the prevalence of party programs as a linkage mechanism varies in accordance with the ‘complexity’ of party competition.

Earlier work [Reinermann 2014] has produced interesting theoretical insights by confronting voters who have different decision mechanisms (‘heuristics’) at their disposal with parties that emphasize issues, rather than positioning themselves on political continua, in an agent-based model. Voters employ that decision mechanism which exerts the least cognitive strain. Varying the number of parties and the breadth of political discourse, predictions are derived on whether this ‘heuristic switching’ shows systematic variation when the political supply side’s offer is more or less heterogeneous.

From the view of spatial models of party competition, there is no reason why parties should compete on more dimensions than voters perceive. But even if they did, the intuition would be that this would ‘confuse’ voters such that they have a harder time selecting a party, because it would add ‘noise’ to their programmatic ‘signal’. In contrast to that intuition, this issue-driven model of party competition finds that a broader range of topics makes it easier for voters to find ‘their’ party based on the policy promises it makes.

In this paper, I expand upon that work by running an empirically parameterized version of the model and testing its predictions in a cross-nationally comparative analysis of survey data, combined with party manifesto data. I see three potential contributions of this endeavour: Firstly, by combining the conceptual accomplishments of both the voting heuristics and party competition literatures, it opens up ways of refinement for both of them where they neglect significant empirical regularities. Secondly, with regard to the study of voter heuristics, it adds a cross-nationally comparative perspective to a research strand that has up to now been strongly dominated by examinations of the US context. Lastly, by decidedly aiming to test the model’s theoretical implications with survey data, it promotes the incorporation of an empirical perspective in the agent-based modeling literature, which has long focussed almost exclusively on theory.

I present the project in the following manner: The following section relates it to the relevant literature more thoroughly and highlights where I think traditional approaches could be improved upon. It reiterates the rationale of the model by pointing out how taking the spatial analogy of party competition too seriously might be misleading and motivates the need of an issue-based model. The next part presents the model setup used here and the predictions that it makes. I then explain the strategy to empirically test these predictions and how important concepts are to be operationalized. Lastly, I present the empirical relationships tested before I conclude.

2 Voter Heuristics and Party Competition

Theories about how voters choose parties ultimately refer to models of human decision making, a very prominent among them being rational choice theory. However, rational choice has been challenged by findings that voters, with maybe the exception of a small sophisticated ‘elite’, generally lack the structure of thinking that its assumptions require.
Referring to classic studies on voter preferences, it has been argued that voters are rather uninformed about politics (Delli Carpini and Keeter 1991), have no coherent system that ties their preferences together (Converse 1964) and even that on most issues, they have no real preferences of their own, but answer in a rather erratic fashion (Zaller and Feldman 1992). This abetted a view of voters as scatter-brained and disoriented and has become known as the ‘minimalist perspective’ (Brooks 2006).

A more constructive reaction to these results has been increased research in alternative decision making mechanisms that voters might employ, mostly in reference to behavioral decision theory. Although separability is obviously not complete here, different foci of research can be recognized. One of them is how voters process information to arrive at a party choice, resulting in several theoretical alternatives to rational choice such as the ‘satisficing’ rule. It basically states that individuals seek one alternative that is roughly satisfactory and stick with it (Gigerenzer et al. 2001). This kind of research has examined the role of affect and cognition in party choice (Lodge and Taber 2005), how voters sometimes are ‘rationalizers instead of rational’ (Sniderman et al. 1991) and systematized different ways of processing information (Lau and Redlawsk 2006).

Another topic, and the main theme of this paper, is what kind of information voters use to make up their minds about politics. Since it was recognized early on that the vast diversity of political issues may be unmanageable for the average citizen, the concept of grand ‘summaries’ of idea elements, i.e. ideologies has been employed for a long time (Downs 1957). However, evaluations of the candidates’ performance (Fiorina 1981), their party affiliation (Schaffner and Streb 2002) and personal appeal (Lau and Redlawsk 2006) or endorsements of people or groups one feels positive about (Brady and Sniderman 1985) have been put forward as information sources as well.

Although in psychological research, the notion would probably be used more in the context of information processing, political science has come to label these information shortcuts as ‘heuristics’, that is mental models that censor some information in order to make decisions more manageable. They have often informed counterarguments to minimalism, stating that voters can often use what little information they possess to make decisions that are ‘as good as’ those they would have made under full information (Lupia 1994), and thus vote ‘correctly’ (Lau and Redlawsk 1997, Lau et al. 2008).

The cornucopia of different heuristics has also led to research into when a given heuristic is used and how effectively so. Schaffner and Streb (2002) assess the ease with which voters arrive at a candidate preference with and without a partisan cue. Van der Straeten et al. (2010) link the use of heuristics to the complexity of the decision environment in a study on strategic voting. Hayes (2009) evaluates the popular sentiment that television has ‘personalized’ voting.

In that vein, there also have been studies that, instead of applying one single voting behavior model, allow for several different models to be employed and examine their prevalence in a given electorate (Rivers 1988). Bartle (2005) argues that British voters differ in the weight they assign to a party leader’s personality making their party choice. Baldassarri and Schadee (2006) inductively identify different decision making types among the Italian electorate.

The guiding proposition of voting heuristic research, as it has been aptly summarized
by Lau and Redlawsk (2006), is that voters have two conflicting goals: They want to make a good decision, but tend to make easy decisions instead (also see Gigerenzer et al. 2001). This entails that, if only subconsciously, people abandon one style of decision making in favor of another if it turns out to involve too much cognitive strain. This raises the question whether the political context voters are situated in affects their heuristic use by altering the levels of cognitive strain these heuristics exhibit.

However, as hinted above, research on that question has often been more interested in the functionality of heuristics rather then their use. It has also rarely taken a cross-nationally comparative perspective (One exception is D’Amico 2013 who examines whether different political institutions make the use of this or that heuristic more or less likely). Also, important factors remain to be examined. What is centrally for my research, the literature presented here has at best superficially evaluated the influence of party system characteristics.

In the context of the present paper, I primarily ponder the question which circumstances of political competition make party-voter linkages based on party programs more or less likely. I believe this is an important question because ideological messages occupy a special position among all of the heuristics presented above. This should be true from a functionalist perspective, since it ought to make correct voting more likely, but, independently from that, also from a normative one. For example, voters basing their choice on party programs is one of the requirements of the Responsible Party Model, which can be seen as a minimum standard by which to evaluate political representation (Thomassen and Schmitt 1999, ch. 1).

For this requirement to be met, there have to be actual differences between the parties’ programs and voters have to perceive them (Ibid., p. 15f). It does not seem as a large theoretical stretch to suppose that these criteria are strongly related to each other. Different structures of party competition are likely to give voters a better or worse chance to perceive parties as different. For instance, it has been found that party system polarization improves the performance of ideology as a heuristic (Lau et al. 2008, Bower-Bir and D’Amico 2013).

However, a crucial assumption that is often implicitly made is that the political space, as voters perceive it, is accommodated by space as parties build it. In most research on voter decision making, it has been left untested: Ideology is operationalized as a single continuum on which political debate can be mapped. This stands in odd contrast to research that primarily focusses on party competition: Although the empirical evidence is not unambiguous on the nature and number of political dimensions, it must be assumed that a unidimensional conception of European party systems is undercomplex (Warwick 2002), and increasingly so over time (Albright 2010). Furthermore, adherence to unidimensionality does vary across party systems (Rovny and Edwards 2012).

This variation has only rarely been taken into perspective in voter behavior research. This is all the more curious since there are empirical results that suggest it plays an important role in voter decision making. Van der Eijk, Franklin and Van der Brug (in: Thomassen and Schmitt 1999, ch. 8) find that the explanatory power of left-right positions
for party choice is weaker in countries where voters have very heterogeneous perceptions of the parties’ left-right position. It is also found to change over time (Van der Eijk, Schmitt and Binder in Thomassen 2005 ch. 7). Still, the structure of party competition is not considered as an explanatory factor there. Indeed, even where acknowledging the multidimensionality of party competition, research on voter perception has posited that voters adhere to unidimensionality (e. g. van der Brug 1999).

Existing research that directly deals with differences in the dimensionality of political debate has curiously predominantly engaged the problem from an entirely different direction, trying to explain how through strategic behavior by the parties, the left-right dimension emerges in multidimensional opinion spaces (Shikano 2008, McGann 2008). These theoretical accounts, however, neither take into account the aforementioned cognitive limitations of voters nor the fact that it may also lie in the strategic interest of parties to establish new dimensions of competition (Carmines and Stimson 1986, Kriesi et al. 2006).

If the minimalist account is to be given any credence at all, one would expect that most voters do not think in more than one dimension. Much more in line with that, Gigerenzer (1982) argues that voters generally do not perceive multiple dimensions, but assimilate all of them into a unidimensional view of the party system. Moreover, they do not all perceive the same left-right pattern, but exhibit idiosyncratic unidimensionality. However, this model does not really allow for strategic behavior on part of the parties, since strictly seen, they cannot be sure whether voters perceive changes in their programs at all.

This reveals the need to understand party competition not in a ‘strongly spatial’ sense (Humphreys and Laver 2010), but as issue-based. Political dimensions arise as the product of different clusters of issue emphases and not the other way round (Franzmann 2013). While these clusters can contain issues that are mutually exclusive by logic (Robertson 2006), they are not necessarily mirror images of each other, as spatial theory is prone to suggest (Budge and Farlie 1983, Budge et al. 2001 ch. 3).

Hence, Reinermann (2014) studies how the issue diversity of party competition influences the decision making of voters in a model where parties emphasize single issues instead of positioning themselves on a continuum. Thus it can accommodate both parties’ capabilities to ‘sort’ voters across issues (Baldassarri and Gelman 2008) as implicit in McGann (2008) and voters’ tendencies to overlook issues that do not fit into their decision making heuristic (as maintained by Gigerenzer 1982) at the same time. I present the structure of the model, and the specific parameterization applied here, in the next section.

3 Model

Since such a model exhibits considerable complexity, to formalize it in a traditional equation-based fashion would probably not yield a meaningful, analytic solution. Therefore, an agent-based model is formulated, an approach highly suitable for the examination of complexity-laden, non-linear systems (Miller and Page 2007, Gilbert 2008). Agent-based models have repeatedly been used to make advances in the understanding of party systems where traditional models were found to make unrealistic assumptions (e.g. Laver and Sergenti 2012). Interestingly, they have until now been restricted to spatial formulations.
Different to traditional formal modeling approaches, agent-based modeling, instead of defining relationships between variables in mathematical equations, directly models the behavior of actors as a set of behavioral rules expressed in ‘if A then B’ statements. The dynamics and emergent properties of the interaction between different behavioral rules are then studied in a computer simulation.

In the model used here, an ‘artifical electorate’, consisting of 1,000 voters each, is created for each simulation. The structure of party competition, which is the main concept of interest, is represented by the number of issues $I$, that is the maximum number of topics that can be subject of political debate, and the number of parties $P$ that compete in the system. The simulations consist of an iterative taking-turns of voters choosing a party to support and parties adapting their program to improve their support share. Voters are assumed to possess two different decision heuristics: One is termed programmatic voting and takes into account the parties’ actual messages. The other heuristic is likability voting, modeled as an exogenous sentiment of sympathy. Voters switch between the two in between iterations contingent on which has the smallest decision costs\(^2\).

### 3.1 Voter Behavior

Since the model’s interest is in what heuristics voters use, the most important aspect is how the selection of a heuristic is modeled. As mentioned above, voters are assumed to (unconsciously) make this selection based on what is the easiest way of decision-making. It follows that a heuristic is used if the signal that it creates is stronger than other heuristics’ signals. Since (in most democracies) party support is a decision for only one party, the most important piece of information voters need to gather is which party is a better choice than any other. That means they face a problem of choice instead of evaluation (Lau and Redlawsk 2006). Accordingly, voters decide by that heuristic which most clearly separates ‘the best from the rest’\(^3\). Technically, this is accomplished by computing the party rankings that a given voter would arrive at for each of the heuristics at her disposal. She then uses that heuristic that produces the ranking with the largest distance between the first and second ranked party to cast her vote.

The programmatic voting mode works as follows: Each voter is characterized by her attitude regarding each of the issues (supportive, opposed, or indifferent) on the one hand and whether she actually uses an issue to judge political debate on the other. These issues are referred to as diagnostic issues. Voters thus engage in ‘fast and frugal decision making’ as conceptualized by Lau and Redlawsk (2006, p. 13f). For example, a voter might choose one party over another solely because it promises to raise the minimum wage. She might also approve of environmental protection, but not consider the parties’ stances on that topic because it is not among her diagnostic issues.

\(^2\)To ensure that an approximately steady state is reached, 1000 iterations of these taking-turns are carried out per simulation. A ‘burn-in’ phase of 100 iterations is included in which voters only decide on programmatic basis, without switching heuristics. Also, parties ignore issue ownership in this phase (see below). This is necessary since parties build their program ‘from scratch’ and therefore there are very little model dynamics when the model starts directly with the initial parameterization.\(^3\)This is not to say that heuristic choice is a deliberate decision made by the voter, but it is modeled in that fashion for the sake of explicitness (Kroneberg 2005).\(^4\)Note that this includes the assumption that if an issue is used to evaluate one candidate, it is also used to evaluate the others (Lau et al. 2008, p. 396).
How many and which issues voters have preferences on, and what these preferences are is determined through random draws from a uniform distribution. Since voters cannot only disagree on issues themselves, but also on what political discourse is actually about, different degrees of correlation of the diagnostic issues are induced. First, the number of issues that serve as diagnostic is determined for each individual voter by random assignment of a number $d_v$ that serves as its expectation. Contingent on that expectation, diagnostic status is assigned on basis of different probability distributions, which are shown in figure 1: While the first distribution is uniform and therefore makes the diagnostic issues of different voters unrelated, the other two create electorates that increasingly agree on the standards by which to judge the parties.

The preference profile thus arrived at now serves to transform party programs into a measure of how well a party represents the voter’s views. More precisely, the preferences on her diagnostic issues are combined with the saliencies of these issues in the party program to build a ‘programmatic score’. Saliency of an issue is expressed as the share that statements on the issue occupy among all of the party’s statements ($\frac{s_{pj}}{S_p}$). The party scores negatively if it issues statements the voter does not like to hear and positively if it states views the voter agrees with. The programmatic score of a party $p$ from the perspective of voter $v$ is defined as

$$V_{pv} = \sum_{j=1}^{I} i^d_j i_j s_{pj} S_p,$$

where

$$i^d_j = \begin{cases} 
1 & \text{if diagnostic} \\
0 & \text{if not} 
\end{cases} \quad \text{and} \quad i_j = \begin{cases} 
1 & \text{if positive issue} \\
0 & \text{if indifferent} \\
-1 & \text{if negative issue} 
\end{cases}.$$

As discussed above, the primary interest of the model lies in the effects of the party
system on the prevalence of programmatic voting. Because of that, likability voting is much less explicitly modeled and can be interpreted to represent either of the voting heuristics mentioned in section 2 or as an amalgam of them. The ‘liking’ $L_{pv}$ voter $v$ has for party $p$ is randomly chosen from a uniform distribution and remains fixed over the course of the simulations. One ‘move’ of the electorate, with regard to an individual voter’s behavior, can thus be summarized as follows: In each iteration

1. Compute the programmatic score $V_{pv}$ of each party according to its updated issue statements.

2. Produce rankings of the parties on basis of both the $V_{pv}$ as well as likings $L_{pv}$.

3. Use that ranking as voting heuristic that produces the clearest ‘winner’.

4. Declare support for this winner.

### 3.2 Party Behavior

The strategic capacities and acts of parties are modeled closely to the saliency-theoretic prototype. As hinted above, party programs are characterized by how salient issues are relative to each other. Technically, this is represented in the distribution of the $\frac{s_{pi}}{s_p}$ a party exhibits over the whole of $I$. The model organizes the process of making statements by random asynchronous execution \(^{(Gilbert 2008)}\) p. 28): In each iteration when the parties ‘have their turn’, one party and one issue are randomly chosen and the party decides whether to emphasize that issue in its program or not.

It decides on that through the signal it obtains from voters that currently declare support for the party. Specifically, it increases the number of statements $s_{pi}$ by five when 34 percent or more of its supporters (i.e. more than the expected value in a random draw of attitudes) are in favor of the issue. This resembles the Tiebout sorting model \(^{[1956]}\), which has frequently been applied in agent-based models of political processes (e.g. Kollman et al. \(^{[1997]}\) McGann \(^{[2008]}\). If this threshold for both relevance and popularity of an issue is not met, the party does nothing (which also means there is no ‘taking back’ of statements). Since ‘issue ownership’ is an integral part of saliency-driven theories of party competition, parties also remain silent on an issue if any other party has devoted more than half of its program to the issue at hand. \(^{[Reinermann (2014)]}\) To summarize, the party $p_{ts}$ that is selected in an iteration $t$ follows the following behavioral rule:

1. ‘Poll’ current supporters on their preferences regarding the currently salient issue $i_{jt}$.

2. If a sufficiently large share of them has a positive view of the issue and if the issue is not ‘owned’ by another party, emphasize this issue (increase $s_{pj}$).

\(^{[Reinermann (2014)]}\) shows that the level of programmatic voting is affected if parties do not obtain signals exclusively by their own, but by other parties’ voters, as well as the amount that parties increase $s_{pi}$ and the ‘ownership threshold’. However, neither of them is found to change the pattern of effects that number of parties and issues have. We therefore keep these parameters fixed to reduce computational expense.
3.3 Dynamics and hypotheses

In accordance with the empirical sample (see section 1), I ran simulations with the number of parties varying between 2 and 12 and the number of issues ranging from 36 to 55.\footnote{In the sample, the number of parties range from 2 to 12 and the number of issues from 37 to 54. The simulations in Reinermann (2014) used a reduced range for the number of parties (2-8) and a very different one for the number of issues (2-16).} Realizations of agent-based models, if they include random elements, can be interpreted as draws from the underlying probability distribution defined by the model (Izquierdo et al. 2009). Thus they can be examined for regularities by use of descriptive and inferential statistics. I make use of that property to arrive at hypotheses for the ensuing empirical analysis in this section.

I reiterate the presentation style of Reinermann (2014) by first producing a ‘heat map’ of programmatic voting contingent on numbers of parties and issues modeled (figure 2). It shows a marked effect of the number of parties on the prevalence of programmatic voting. More parties are thus predicted to be more able to appeal to voters’ preference profiles and make them perceive their platforms as distinct. With regard to the number of issues, a similar, yet much more subtle pattern becomes apparent. This stands in contrast to results obtained with the original model, which used a different parameterization. Still, the figure suggests that greater diversity of topics in political discourse makes it easier for voters to base their choice on said discourse.

An analysis of the probability to vote programmatically on the micro level (see table 1) repeats this pattern. Additional parties clearly induce the ‘model voters’ to increasingly follow their political preferences rather than liking of the parties when casting their vote. The effect of issue diversity, although significant, is very small and clearly overshadowed by this relationship. Again, this deviates from the results of the original model, where the effects were more similar in size. More importantly however, it stands in a stark contrast to the purely spatial model, which implies a negative effect: From that perspective, the prediction that more topics have no or a small positive effect on the perception of party competition is considerably puzzling. Another interesting hypothesis arises from the interaction effects implemented in model 3, suggesting that if there are ‘not enough’ par-
### Table 1: Micro-level examination of simulation results

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>Coeff.</td>
<td>Coeff.</td>
</tr>
<tr>
<td></td>
<td>(se)</td>
<td>(se)</td>
<td>(se)</td>
</tr>
<tr>
<td>No. of Issues</td>
<td>0.001*</td>
<td>0.000</td>
<td>-0.003**</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>No. of Parties</td>
<td>0.171***</td>
<td>0.171***</td>
<td>0.165***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Med. $i_j^d$ Correlation</td>
<td>0.022***</td>
<td>0.022***</td>
<td>0.022***</td>
</tr>
<tr>
<td>Reference: No Corr.</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>High $i_j^d$ Correlation</td>
<td>0.029***</td>
<td>0.029***</td>
<td>0.029***</td>
</tr>
<tr>
<td>Reference: No Corr.</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Diagnostic Issues (Ratio)</td>
<td>2.054***</td>
<td>2.036***</td>
<td>2.029***</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Preference Issues (Ratio)</td>
<td>1.962***</td>
<td>1.962***</td>
<td>1.962***</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.010)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>Diag. Iss. * Issues</td>
<td>0.002</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Parties * Issues</td>
<td></td>
<td></td>
<td>0.001***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.000)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.981***</td>
<td>-2.972***</td>
<td>-2.937***</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.014)</td>
<td>(0.016)</td>
</tr>
</tbody>
</table>

Logistic Regression, DV: Programmatic Voting (**p ≤ 0.01 ***p ≤ 0.001)
Issues and Parties substracted with resp. minimal values. N = 660,000.

On the voter side, the model predicts more programmatic voting if voters agree to a larger extent on what the actually important topics are (represented in the coefficients of dummy variables indicating different degrees of diagnostic issue correlation). This is remarkable in so far that party behavior is modeled as completely ignorant of this aspect. Otherwise, the model reproduces the greater capabilities of more sophisticated voters (here: voters that have preferences on and/or use as diagnostic a larger share of all issues) to handle political debate that has become something of a ‘stylized fact’ of voter research [Sniderman et al. 1991, Lau et al. 2008].

### 4 Empirical Strategy

This section employs the graphical and statistical analyses of the model output presented above as hypotheses to be tested empirically. To do that, I combine survey data from the second edition of the Comparative Study of Electoral Systems (CSES) with those from the Comparative Manifesto Project (CMP, Klingemann et al. 2006, Volkens et al. 2013). Because of the structures of the data sets, I arrive at a cross section of surveys taking
Table 2: Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables measured on the individual level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programmatic Linkage</td>
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<td>.440</td>
<td>.496</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Political Information</td>
<td>42863</td>
<td>1.456</td>
<td>1.106</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Education</td>
<td>42418</td>
<td>5.082</td>
<td>1.777</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Union Membership</td>
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<td>.242</td>
<td>.428</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Religious Commitment</td>
<td>38161</td>
<td>.442</td>
<td>.368</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age</td>
<td>42564</td>
<td>47.208</td>
<td>17.073</td>
<td>17</td>
<td>102</td>
</tr>
<tr>
<td>Female</td>
<td>42766</td>
<td>.524</td>
<td>.499</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Income Quintile</td>
<td>35090</td>
<td>2.917</td>
<td>1.353</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Satisfaction w/ Democr.</td>
<td>40135</td>
<td>1.599</td>
<td>.791</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Variables measured on the country level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of Parties</td>
<td>27</td>
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place around 27 elections in 26 countries between 2001 and 2006. Summary statistics of the variables used (description below) are presented in table 2. I test the predictions presented above by estimating logistic regressions of the individual probability to be linked to a party through its program.

Given that there is a lot of experimental research on voting heuristics, a justification for using observational data here is in order. This is all the more the case because it is a dire concern for the latter how the use of voting heuristics can be operationalized, while experimental methods, which exactly track of the participants’ behavior on the computer, establish without ambiguity what kind of information they primarily use. However, this is traded off with the ability to create actual context differentials. Rigorous as the ‘hypothetical campaigns’ from experimental research may be designed, they depend on the assumption that the ‘laboratory party system’ will make participants abstract from the routines and thought patterns they have developed within their ‘actual party system(s)’. Especially with regard to party system structures as an independent variable, I therefore think that observational and experimental evidence both have merit in answering the questions posed here.

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Australia, Bulgaria, Canada, Denmark, Finland, France, Germany, Great Britain, Hungary, Iceland, Ireland, Italy, Japan, Korea, Mexico, Netherlands, Norway, New Zealand, Poland, Portugal (2x), Romania, Slovenia, Spain, Sweden, Switzerland and the USA. I deleted Russia from the sample because it was rated ‘partly free’ or even ‘not free’ in the Freedom House data during my period of observation. On a similar note, Mexico was kept in the sample, although I admit that it represents a borderline case being rated ‘partly free’ until right before the period of observation.
4.1 Dependent Variable

That being said, operationalization of the dependent variable remains an intricate task nevertheless. Because surveys usually (with the exception of e.g. the British Election Study data used in Bartle 2005) do not ask respondents what the driving force behind their party choice was, this has to be inferred from the degree to which their answers conform to how a particular heuristic is conceptualized. For instance, measures of ideologic voting usually involve an indicator of whether the respondents’ party choices align with the ‘proximity criterion’ of spatial voting theory.

Heuristic use thus is commonly operationalized as a synthesis of a variable that measures support of a party and one that measures it as predicted by a particular theory. Here, the first of the two will generally be assessed by an item that asks respondents how much they like or dislike each of the parties on a 0-10 scale. The ‘objective’ party support therefore is that party a respondent ranked highest on the ‘like-dislike’ item. This is to avert an important pitfall in using the actual vote; if strategic voting is possible, this variable may produce biased measurements. The ‘like-dislike’ item, on the other hand, is more likely to map sincere preferences.

To arrive at an operationalization of programmatic linkage, as I will refer to it here, I combine the respondents’ preferences with an item that asks them whether there is a party that represents their views best. By including an explicit reference to policy content (views), I think this item is very likely to be understood by respondents in terms of policy messages. Programmatic linkage is operationalized by a dummy that equals one if the respondent (i) answers yes to this question and (ii) the party (s) he subsequently identifies as representing her/his view is also that party to which (s) he assigns the highest rating in the ‘like-dislike’ item. The variable thus follows the composite logic of combining whether external factors are conducive to using a heuristic (availability) and whether a voter’s behavior conforms to its concept into a measure of likely heuristic use detailed in Bower-Bir and D’Amico (2013) and D’Amico (2013).

4.2 Macro-Level Variables

The number of parties is measured simply by count of the parties that can claim ‘relevance’ according to the CMP data. The diversity of political competition, being a rather abstract concept, will be operationalized in two different ways. The first is the direct analog of the number of issues as used in the model, i.e. the number of issues that are addressed by the parties in a given system. It is captured in the analysis by the number of issue categories of the CMP that were addressed by at least one party in an election.

However, this indicator ignores important features of issue diversity, so that I augment it with a second measure. Firstly, some issues are not emphasized to different degrees by different parties, but are popular across the board, i.e. they are valence issues (Stokes 1963). Moreover, even with a high number of issues, emphasis differentials on each of them may be well predictable from the others, that means issues correlate on a low number of dimensions.

---

*I make an adjustment with regard to Italy in 2006: The CMP lists 16 parties, which however fall into two electoral alliances with joint manifestos. I therefore set the number of parties to two.*
Because of that, I use an additional measure termed the **effective number of political dimensions (enpd)**: Inspired by the way in which Ganghof et al. (forthcoming) arrive at their measure of the same name, I first identify the underlying factors in the CMP data through a principal component analysis of the issue saliences in each election. I define the resulting components to be relevant if they exhibit an eigenfactor > 1. I then calculate the effective number of dimensions as the sum of the relevant eigenfactors, each of them divided by the largest of them (thus providing for a minimum number of dimensions of one).

Lastly, the degree to which voters use the same or different diagnostic issues (i.e. the different correlation patterns in figure [1]) proved to be play an important role in the theoretical model. Making the not unreasonable auxiliary assumption that said issues are also the ones that voters care most deeply about, I turn to an open-ended question in the CSES that asks respondents what they consider the most important problem their country had to face in the recent legislative period. I calculate the shares of respondents naming the same issues for each countries. As a proxy measure for the correlation in diagnostic issues I compute the Herfindahl-index of these shares to arrive at a measure I call **Most-Important-Problem (MIP) correlation**.

### 4.3 Micro-Level Variables

#### 4.3.1 Variables of main interest

The model’s two central variables on the voter level were the shares of issues that an individual actually has preferences on and those she uses for evaluating parties’ programs. Through both the nature of these variables and the logistic limitations of surveys, they can only be operationalized by proxy. On basis of this assessment, I use **education** (by use of the 8-level variable provided in the CSES) as an individual characteristic of which I assume that it relates to a tendency to build opinions on a large variety of societal problems.

For the empirical analog of the number of diagnostic issues, I rely on the assumption that those who have more knowledge of political affairs are more capable to think about their political preferences in a systematic way. I therefore turn to a series of political knowledge questions (for a discussion see Grönlund and Milner 2006). Three of these questions were asked in each country in the context of the CSES; **political knowledge** depicts a simple count of the questions a respondent answered correctly.

#### 4.3.2 Controls

Although they have been shown to be of increasingly less explanatory power over time (Thomassen 2005), sociological factors need to be considered an important competing explanation in the context of my research question, and especially given the operational-
ization of the dependent variable, since they supposedly constitute powerful party-voter linkages. I use union membership and religious commitment\textsuperscript{10} to account for that.

Another caveat with regard to the operationalization of programmatic linkage is that the item that asks for a party that represents the respondent’s views may actually be used by respondents to express mere discontempt with the political process in general. I include a variable capturing positive attitudes towards the political process (expressed by the CSES item asking for respondents’ satisfaction with democracy, reversely coded) to partial out this potential confounder. As additional controls, the analysis uses the age, gender and income quintile of a respondent.

5 Results

Table \ref{tab:results} presents the results of several logistic regressions that estimate an individuals probability to be linked to a party by its program, conditional on the variables discussed above. It is sub-divided according to whether it uses the number of issues or the effective number of political dimensions (\textit{enpd}) as one of its independent variables. For each of the two, the same progression of models is estimated. Standard errors are clustered on the level of the surveys comprising the CSES. For a graphical overview, figure \ref{fig:share} shows the share of respondents defined as basing their party preferences on party programs in each country in relation to the two measures and the number of parties.

Analyses of the simulation output suggested that the number of parties and the breadth of topics they talk about have a positive effect on an individual’s probability to bear party preferences based on policy. Furthermore, it was found that the two are contingent on each other with regard to that effect. The latter of these patterns is indeed reflected in the empirical data: In those models interacting the respective variables, their coefficients are negative, while the coefficient on the product term is positive. However, this interaction effect is statistically significant in only one model specification. Another implication of the model was that individuals that have preferences on a lot of different issues are more likely to relate to a party on programmatic grounds. The coefficient of education, which was intended to serve as a proxy for this concept, has the expected sign in the regressions and reaches at least modest statistical significance in several specifications.

\textsuperscript{10}This variable is primarily measured by frequency of attendance at religious services. To reduce missings, self-proclaimed degree of religiosity was used where the aforementioned variable was not available. In either case, the variable is rescaled to range from zero to one.
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Table 3: Logistic Regressions, dependent variable: Programmatic Linkage

Standard Errors clustered at Election Level. *p ≤ 0.1 **p ≤ 0.05 ***p ≤ 0.01.
Issues and Parties substracted with respective minimal values.
Observations were weighted by ‘sample’ weight provided in the CSES. Unweighted results are essentially similar.
Another central concept of the theoretical model was that of diagnostic issues: Voters were assumed to not judge parties under consideration of each and every topic, but to use only some of them as a shortcut to engage in ‘fast and frugal decision-making’. Still, those who use more information (i.e. have more diagnostic issues) were predicted to ‘find their way’ better, resulting in an increased prevalence of programmatic linkage. Also, electorates as a whole were supposed to exhibit higher shares of programmatic voters if they tended to use the same diagnostic issues. The estimates strongly suggest that the model needs to be revised in that regard. While the findings on political information (our proxy for diagnostic issues) remain unconclusive depending on model specification, the degree of correlation with regard to what respondents consider the most important problem in their country has a (statistically significant) negative coefficient throughout the different model specifications.

Lastly, there are important findings with regard to the control variables and their effect on programmatic linkage. While satisfaction with democracy, as expected, captures certain shortcomings of its operationalization, I find union members, older and male respondents and those with higher income to be more likely to evaluate that party best which they claim to represent their views. We take that finding up again in the succeeding section.

6 Conclusion

In the heyday of minimalism, voters’ attitudes and decisions were at times depicted as so unreliable that one might have feared that the very foundation of democratic government, i.e. citizens making reasoned choices between policy alternatives and selecting representatives to act in their interest, was essentially an illusion. Fortunately, this bleak vision has conclusively been challenged by a lot of research showing that even if voters are no geniuses, they can still arrive at reasonable, meaningful decisions. This paper attempted to proceed in this tradition by studying an empirically parameterized version of an agent-based model of party-voter linkage in which issue-driven party competition was combined with incompletely informed voters that use different decision heuristics.

This model explicitly designs an selection mechanism for these heuristics based on the cognitive strain they create, and derives predictions as to how the context of the decision influences the selection. Interestingly, these predictions appeared as a veritable antithesis to the minimalist perspective, implying that just as making choices in a specific manner should be conceived as more difficult (i.e. more alternatives are available and more information is available to evaluate them), boundedly rational voters increasingly employ that very decision-making mechanism.

Putting these propositions to the empirical test has shown that this antithesis is likewise unsustainable: Statistically significant results largely absent, it must be concluded that the model in its current form is unequivocally not supported by the data. Even worse, one important variable, i.e. the degree to which citizens agree on what political debate should actually be about, showed significant results inconsistent with the model. Although I suspect that has to do with the variable’s operationalization as well (respondents frequently identify valence issues, such as corruption, as the the most important problem in their country), this deals a serious blow to the model.
Similarly curious is that political sophistication, traditionally found to be a major explanatory factor for citizens’ different ways to think about politics, only showed inconclusive results. This urges a revision of how individuals’ evaluation of party programs is currently modeled. In that context, findings concerning variables not considered by the model create opportunities for refinement as well. For instance, the higher probability of older respondents to base their party preference programmatically suggests a political experience effect that could easily be incorporated and studied in the model. Another possibility would be to include interaction between voters and thus allow for networking effects (as suggested by the consistent effect of union membership), which have already been fruitfully employed in agent-based models of voter behavior (e.g. Fowler 2005, Fowler and Smirnov 2005).

Still, I interpret the results as an indication that the model needs to be improved upon, but not be discarded entirely. I base this assessment primarily on the fact that while it cannot be ruled out that the findings concerning party competition structure are random occurrences, they mirror the pattern produced by the model. This pattern constitutes a considerably distinct hypothesis, which may still be supported when tested on a larger set of countries, especially given that the model itself predicts the effects to be small.

If nothing else, this paper in my view accomplishes two important things. Firstly, it follows up on the as of yet very thin line of research on differences between how parties and voters perceive political discourse, specifically the number of dimensions they ascribe to that discourse. Existing research has up to now emphasized how parties transform political space towards unidimensionality. The empirically very relevant constellation of parties competing on more dimensions than voters plausibly perceive has not been considered. One accomplishment of this paper and the research it builds on is to establish that a strongly spatial formulation of party competition reaches its limit in that context.

Agent-based models can be helpful to overcome these limitations by allowing for an issue-based understanding. More generally, they retain the analytical rigor of formal models, as well as their openness to emergent, unexpectant phenomena, without being restrained by simplifying yet implausible assumptions (especially with regard to actors’ information and rationality). The second achievement of this paper lies in meeting the often stated demand for systematic empirical tests of the predictions agent-based models make. Especially in the area of party competition, agent-based models have made exciting theoretical progress where the assumptions of traditional formal models were unnecessarily demanding, but with rare exceptions (e.g. Laver 2005, Schumacher and Vis 2012) have not been empirically tested. By running the model with empirical parameter values and evaluating its findings with cross-nationally comparative survey data, the paper attempted to advance a closer connection between formal modeling and empirical analysis.

References


