Measuring and Explaining the Complexity of 'Left-Right' Perceptions of Political Parties

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Abstract

This paper examines the nature of dimensional complexity in voter perceptions of party left-right locations. Most theoretical and empirical research on electoral politics treats these locations as based on a one-dimensional ideological spectrum. We measure variation in the complexity of voters' perceptions of left-right party locations and demonstrate that this quantity varies widely. First, we generate a measurement of the complexity of perceived left-right party placements positions applied to the Comparative Study of Electoral Systems (CSES). This complexity measure, based on the fits of scaled dimensions of party placements, allows us to compare this concept across countries and regions. We then examine several possible correlates to the cross-national variation. We conclude with a comparison of this concept to issue dimensionality using data from the European Election Study (EES)

1 Introduction

The perception of political parties' locations on a spatial dimension of competition is a critical part of democratic linkages between voters and parties in modern political systems (Ezrow, 2008; Powell, 2009; Klingemann, 2009; Dalton et al., 2011; Dow, 2011; Powell, 2013; Dalton, 2013). Most often, spatial locations are communicated in terms of "left" and "right." The concept of left-right contains information about how voters receive and compare different parties' messages. Voters and political observers routinely use left and right placements as "short cuts" to understand how parties and policies relate to one another (Conover and Feldman, 1981, 1989; Lupia, 1998; Lau and Redlawsk, 2001; Carroll and Kubo, 2018a). Scholars of party politics meanwhile rely on left-right party placements to explain political orientations, voter choice and policy congruence, especially in tandem with spatial party competition models (Merrill and Grofman, 1999; Thomassen, 2005; Kedar, 2009; Meguid, 2010; Dalton and Anderson, 2011; Calvo and Hellwig, 2011; Carlin et al., 2015). Most of the research on party competition and representation relies on one-dimensional interpretations of left-right scales for these measures. Although a given left-right scale itself is one dimensional, voters' vary in whether their *perceptions* of left-right party placements can be captured by a single dimension.

In this note, we propose a measure of the degree of complexity across party placements of the left-right political space in each country and demonstrate some cross-national correlates of this variation. The complexity measure uses the "dimensionality" of party left-right placement responses in survey data, which we illustrate using the cross-national Comparative Study of Electoral Systems surveys.

To measure left-right complexity in a cross-nationally comparable fashion, we compute a weighted index of the dimensional fit statistics from the Blackbox Transpose scaling method applied to left-right party placements (Poole, 1998; Armstrong et al., 2014; Poole et al., 2015), a multi-dimensional generalization of the Aldrich-McKelvey method (Aldrich

and McKelvey, 1977) designed to uncover latent patterns within stimuli placement data. These fit statistics capture the degree to which more than one dimension is needed to explain survey respondents' perception across parties.

This note proceeds as follows. We first describe the patterns of left-right complexity across countries and show some examples of the two main dimensions in a European sample. We assess how various countries' contexts, such as development level, contribute to a political space's complexity. We present the results of a cross-sectional regression analysis of several variables on the index of complexity, showing which features of political systems correlate with the dimensionality of left-right perceptions.

In particular, higher left-right complexity exists in new democracies, less nationalized party systems, and, most clearly, in less polarized party systems. We conduct an additional analysis in which we compute a similar score in a sample of Europe capturing mass perception of issue dimensionality, using the fit statistics from scaling responses on multiple policy issues. Here, we show that latent issue dimensionality among mass policy preferences contributes to the complexity of the left-right concept. We conclude by considering the implications for the topics of representation, party competition, and voting behavior.

2 The Dimensional Complexity of Left-Right Representation

While most research has focused on representation characterized in spatial terms with equilibria built on unidimensional models of competition (Downs, 1957; Cox, 1990; Grofman, 2004), scholars have also long highlighted the potential importance of underlying multidimensional spaces (McKelvey, 1976; Schofield, 1978) and complex decision-making contexts (Riker et al., 1996; Miller and Schofield, 2003; Shepsle, 2003; Rovny, 2015; Rovny

and Polk, 2018). A possible reduction in the political space comes from a spatial heuristic in the form of left-right semantics (Conover and Feldman, 1981; Jacoby, 1991, 1995; Lau and Redlawsk, 2001). Established left-right language in political systems reduces the practical complexity of political choices and political communications (Fuchs and Klingemann, 1989). Nevertheless, views of these concepts can still vary across citizens (de Vries et al., 2013; Freire, 2015; Meyer and Wagner, 2018). As a result, the labels of left and right evoke more than one dimension of perception. This is possible because all voters in a political system may not share a consistent *meaning* of these concepts. Here, we have in mind capturing how well a single dimension can explain voters use of left and right labels in placing political parties' perceived reputations.

While left-right labels can simplify the political space, related literature suggests several reasons this might be more or less effective. One critical factor is the structure of the party system itself. If the parties do not provide clear labels, assigning them to left and right positions based on a consistent set of meanings will be more difficult. Even in European countries where left-right competition seems quite strong, there is potential complexity in integrating economic and cultural issues into the left-right labeling of political competition (de Vries et al., 2013; Bauer et al., 2016; Meyer and Wagner, 2018). Primarily, spatial party competition is associated with more party systems in established advanced (Mainwaring and Zoco, 2007; Dalton and Weldon, 2007). Repeated elections in advanced democracies with established parties and labels should provide voters with a better context for parties to establish consistent left-right identities. This is in contrast to party systems in newer democracies with less programmatic and less stable relationships between parties and voters (Dalton and Weldon, 2007; Mainwaring and Zoco, 2007; Hellwig, 2014; Hicken and Kuhonta, 2011; Kitschelt and Kselman, 2013; Lupu and Riedl, 2013; Gélineau, 2013; Kitschelt et al., 2010; Harbers et al., 2013).

Even with programmatic competition, party systems also vary in whether they have encouraged more or less *differentiation* in left-right labels. The degree of emphasis placed

on left and right divergence contributes to the party system's perceived polarization, which should therefore lead to a simplification of the perception of left-right concepts Levendusky (2010); Lupu (2014). Party system polarization provides clarity to party representation by establishing clearer, more distinct reputations to which voters may respond, resulting in voters better able to use ideological cues. Several works have suggested polarization can enhance the clarity and utility of ideological information (Alvarez and Nagler, 2004; Dalton, 2008; Knutsen and Kumlin, 2005; Lachat, 2008; Carroll and Kubo, 2018b).

A larger number of parties enables competition for a wider array of different policy reputations (Kedar, 2005; Abramson et al., 2009; Duch et al., 2010; Indridason, 2011), including different notions of left and right. More directly, the *nationalization* of the party system (Jones and Mainwaring, 2003; Chhibber and Kollman, 2004; Hicken, 2009; Kasuya and Moenius, 2008; Bochsler, 2010), captures whether parties have nationwide identities rather than being based in separate geographical regions. If separate regions have distinct political dynamics with varying notions of left and right, this would naturally diminish the national consistency of left and right terminology and give rise to further dimensions of these ideas.

Although the above party system variables are more proximate, political institutions may also play a role with, for example, presidentialism adding complexity to the relationship between voters and parties (Samuels, 2004; Hellwig and Samuels, 2008; Carey, 2008; Samuels and Shugart, 2010). Presidential candidates can promote left-right definitions at odds to those associated with the parties competing for legislative office. Similarly, federalism separates subnational and national political competition spaces and may directly introduce complexity in left-right definitions.

In the next sections, we explain how we can measure left-right complexity and examine these correlates.

3 Measuring the Complexity of Perceptual Political Space

3.1 An index of left-right complexity: The "Effective" Number of Dimensions

Our interest is in uncovering the complexity of left-right placements of party stimuli. This is distinct from the dimensionality of the issue space—the underlying space uncovered by mass opinions across many policy positions, which we discuss in a secondary analysis below.[1] Instead, we aim to measure the degree to which the left-right perceptions across party stimuli can be attributed to a single dimension of variance. This captures the complexity of left-right perceptions. We capture the complexity of these perceptions using the fit statistics of a multi-dimensional scaling application to determine the 'importance' of higher dimensions in explaining how respondents perceive party left-right locations.

We make use of the method proposed by Poole (1998) to generalize the Aldrich-McKelvey Scaling method (Aldrich and McKelvey, 1977) to multiple dimensions for analyzing ordinal scales in survey data. The original Aldrich-McKelvey scaling routine is designed to analyze stimuli placements (generally, candidates or parties) in a single dimension and estimate voters' distortion in perceiving party positions in a left-right spectrum. Poole's Blackbox Transpose scaling provides a method for estimating stimuli locations for a multi-dimensional space. In contrast to Poole's Blackbox scaling, which estimates respondents' ideal points from a series of issue scale questions (Armstrong et al., 2014; Poole et al., 2015, 2013), Blackbox *transpose* scaling estimates multiple dimensions of latent stimuli positions from a single scale (such as left-right placements) from individual perceptions. The fit statistics from Blackbox Transpose therefore reflect the dimensionality of a single left-right placement survey question applied to several stimuli—in this case, party locations.

[1] This is to be further distinguished from the matter of how elite party party positions incorporate multiple dimensions of ideological competition (Bakker et al., 2020; Rovny and Polk, 2018)

We use the Blackbox Transpose scaling method for dimensional reduction of the survey data and to derive dimensional fit statistics—the extent to which each dimension explains the variation in left-right party placement—that measure dimensionality of the party left-right placements. Here, we begin with a survey data matrix (X_0) of voters' left-right party placements on a 10-point scale. The algorithm estimates the values as follows.

$$X_0 = [\Psi W' + J_N c']_0 + E_0$$

Blackbox Transpose scaling decomposes the original survey data matrix of n respondents by q questions. The models sumes the structure of the survey data matrix is an ordinal scale. As a consequence, we obtain coordinates of q stimuli (Ψ) (q stimuli, in this case, the number of parties), individual respondents' parameters of the n weights (W), an intercept term (c), and an error term (E_0). $J_N c'$ in this model is an n length vector of individuals. The error term (E_0) is assumed to satisfy the Gauss-Markov assumptions of zero means, homoscedasticity, and independence. Weight (W) and constant (c) parameters determine individual positions in the multi-dimensional basic space. In this model, the observed survey data (X_0) is a function of individuals' true coordinates in the basic space multiplied by (W), and constant term (c) and error term (E_0). Here, X_0 and W have the same number of row vectors.

While the stimuli position or ideal points are commonly used outputs, we focus on the fit statistics that capture the extent to which each dimension explains the left-right stimuli placements. We compute the degree of complexity of the political space from these fit statistics using the values of the fit statistics of a three-dimensional scaling output[2] and generate from this a weighted index. The statistic, explained sum of squared error (ESSE), represents each dimension's explanatory power. Taking the proportions of the

[2]We use three dimensions in the present study in order to retain almost all multi-party systems in our demonstration while producing sufficient information for the purpose. For cases for which all versions can be calculated, outputs based on 2, 3, 4 and 5 dimensions correlate between .97 and .99

sum of squared errors, we can compute a weighted index in the same fashion proposed by Taagepera (1997) for party fragmentation: $\frac{1}{\sum ESSE_i^2}$. That is, we use the reciprocal of the sum of the square of the sum of the ESSE statistic. The resulting "effective number of dimensions" index will be closer to 1 as the proportion of variance explained by the first dimension is larger. As the relative importance of the second and third dimensions grow, this measure will increase.

3.2 Dimensional Complexity in Left-Right Party Placement

We compute the values of the effective number of dimensions from the result of Blackbox transpose scaling analysis of the left-right placement of CSES[3] in three dimensions. We use CSES Integrated Module Dataset, which includes module 1-4 (1996-2016), and limit the sample to democratic periods with Polity scores of 8 or above [4] and election surveys with at least four party stimuli in the survey. Since we consider the ratio of weights of three dimensions, the weighted index of the size of the dimensions – the "effective number" of dimensions – ranges from 1 (single dimensionality) to 3 (highest multi-dimensionality). For this sample, the mean value of this quantity is 1.87. The intra-class coefficients for countries is 0.68. Figure 1 displays the cross-national variation.

As illustrations, we show several cases of the estimated stimuli locations plotted in two dimensions in CSES, Germany (Figure 2), and Poland (Figure 3). Germany is an example in which the second dimension contributes relatively little to explaining the observed variance in left-right placements, as the left-right complexity is low with an effective number of dimensions of 1.3. This means the left-right placements are captured almost entirely by the first dimension of variance. In Poland, the distances shown on the second dimension are much more important to explaining how voters locate the parties

[3] `http://www.cses.org/`

[4] This removes all data from Hong Kong, Kyrgyzstan, and Belarus, as well as certain years from countries such as Peru and Mexico.

Figure 1: Dimensional Complexity of "Left-Right" Placements (CSES)

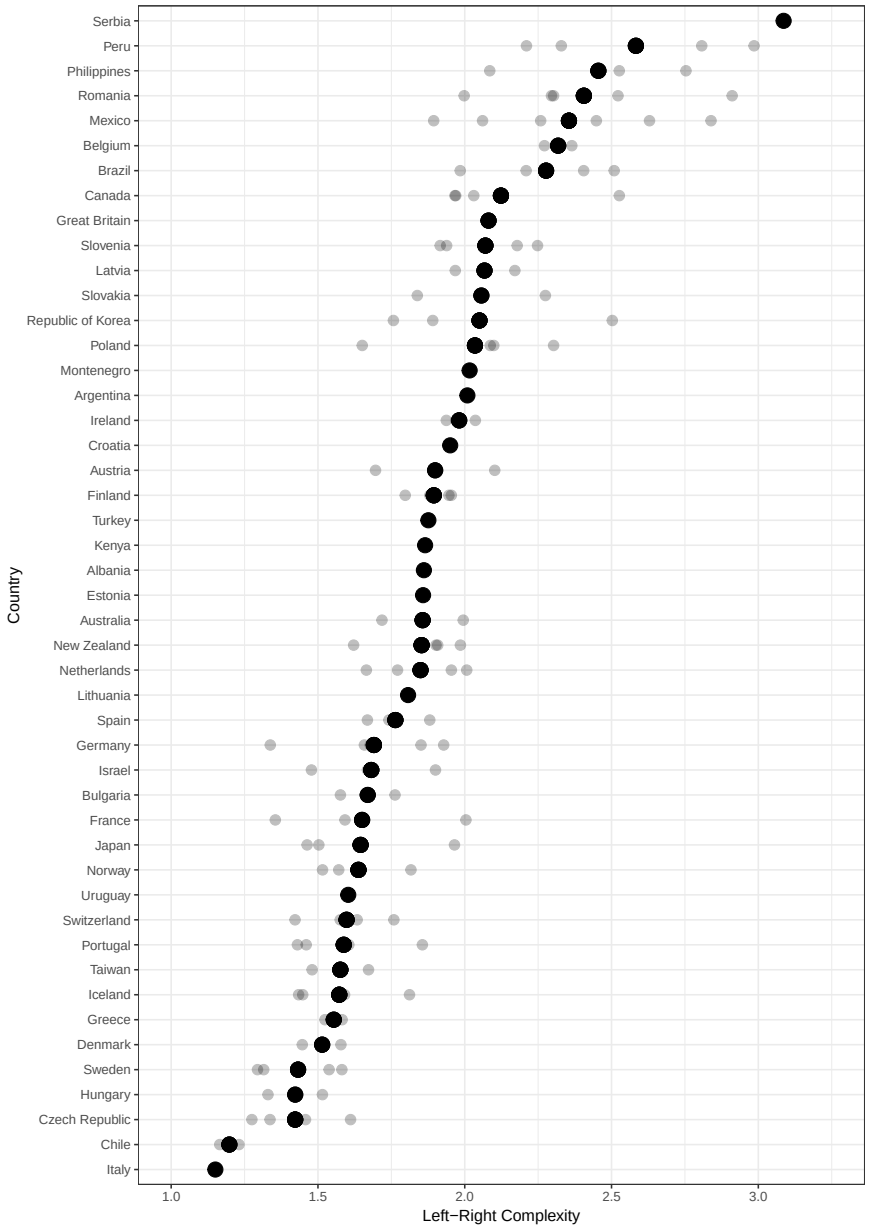
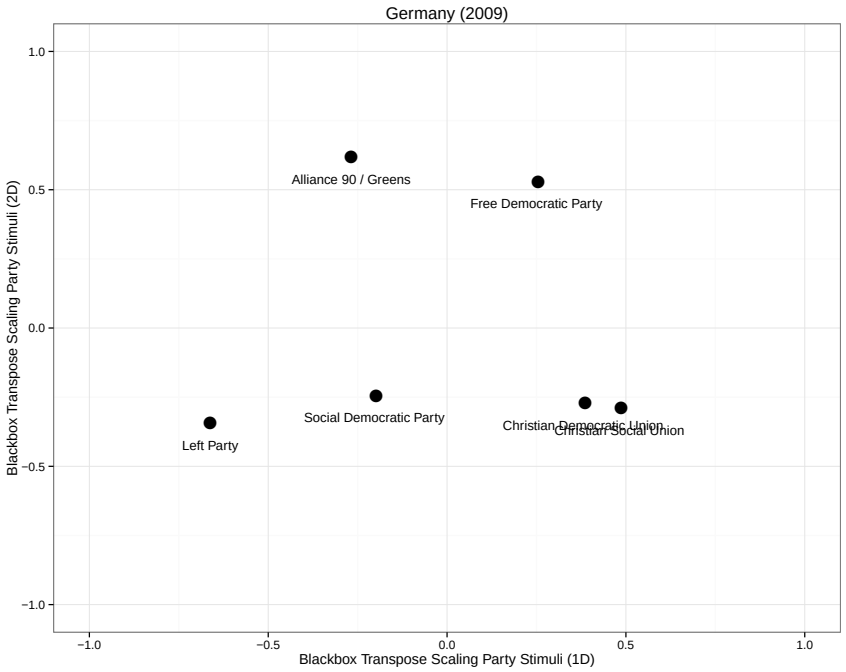


Figure 2: Party positions in a case of low "left-right" dimensionality, Germany 2009 (CSES)



in response to the left-right prompt, with a much higher effective number of dimensions of 2.3. This means there are important systematic factors preventing a consistent use of left-right among voters in the party system.

In another example, Canada's 1997 survey also produces a high degree of left-right complexity–about 1.9. Figure 4 shows that this is driven primarily by the regional Bloc Quebecois and the Reform Party, which represented Populist Right views based in the West.

In this note, we do not examine the substantive content behind these specific party positions on the first two dimensions. Instead, in the next section, we examine the degree to which multiple dimensions contribute to explaining the variance across stimuli in left-right perceptions.

Figure 3: Party positions in a case of high left-right complexity, Poland 2005 (CSES)

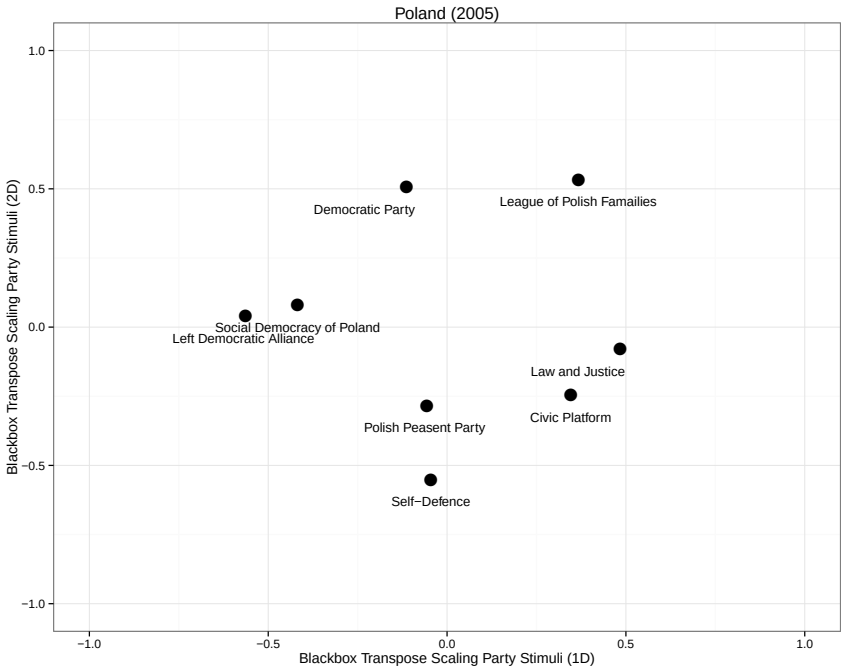
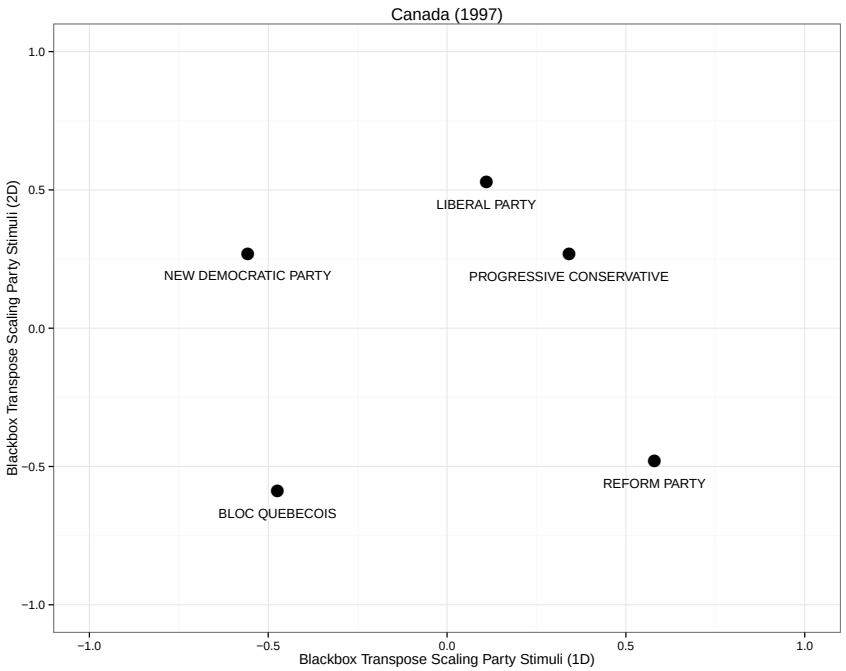


Figure 4: Party positions in a case of high left-right complexity, Canada 1997 (CSES)



4 Correlates of Left-Right Complexity

4.1 Independent Variables

This section examines what factors might cause the cross-national variation in the effective number of dimensions that we observe in the CSES sample.

In general, a more structured party system is likely to reduce the observed left-right complexity. First, we use democratic experience, divided into two groups: established democracies and "new" democracies that transitioned since 1980, which includes all cases in Eastern Europe and Latin America and most Asian cases. We would expect these countries to have less established and less programmatic parties, which could impede the emergence of a single consistent notion of left-right labeling of ideological competition and may result in less clear connections between ideological labels and party labels.

Party system polarization should reduce the complexity of perceived left-right dimensionality. If party left-right positions are clearly distinct, voters can more clearly understand the positions of parties in the main dimension of variance (Freire, 2008; Medina, 2013; Freire, 2015). By contrast, if party positions in left and right terms are perceived as overlapping and undifferentiated, voters would be presented with less clarity with party positions in the main first dimension and faced with a multiplicity of left-right dimensionality. We make use of a party system polarization index developed by Dow (2001), Alvarez and Nagler (2004) and Dalton (2008). The index is calculated by summing the distances between each party's position and the average party position and weighting these distances by party sizes.[5]

Another feature of the party system that may result in inconsistency in left-right labels is the degree to which the party system is nationalized —with competitors competing equally for national votes (Hicken, 2009; Chhibber and Kollman, 2009). Regionalized

[5]We use Dalton's measure available at `https://cses.org/data-download/download-data-documentation/party-system-polarization-index-for-cses-modules-1-4/`.

parties may supply left-right information that deviates from national party system labels. For this, we make use of the CLEA dataset's standardized, weighted Party System Nationalization Score[6]. The score is higher when the party system at the subnational level is most similar to that at the national level.

Party fragmentation may increase the likelihood of more complex left-right complexity, as having more viable parties enables competition for varying definitions of left and right. For this, we use the effective number of parties (Laakso and Taagepera, 1979). To distinguish this from the sheer number of stimuli, which allows increases in the dimensionality, we include a dummy for every configuration of stimuli counts in the survey (from 5 to 9).

Finally, we also include several other contextual variables. First, we include a variable for the presence of a presidential system, which may reduce the clarity of left-right labels by separating presidential and legislative parts of the party system—each of which can use competing notions of "left" and "right" (Samuels and Shugart, 2010; Hicken and Stoll, 2011, 2008).[7] Second, we include a measure of federalism.[8] To account for electoral systems, we use the variable in the CSES integrated dataset, which classifies cases into three categories: majoritarian, PR, and mixed. We also include a measure of turnout based on the measure in CSES, the percentage of voting-age population.

In Table 1, we present the result of a regression of our complexity index—the effective number of dimensions in CSES left-right party placement—on the variables described above. We use a multi-level linear model with a random intercept for each country. With regard to new democracies, we find that the younger party systems are indeed associated with increased left-right complexity. There is also some positive effect for federalism in the first model. In the second model, we introduce party nationalization and polarization, which can are available for a slightly smaller number of cases. When we

[6] `http://www.electiondataarchive.org/`

[7] For the semi-presidential cases, we classify premier-presidentialism into the pure parliamentary category and president-parliamentarism into the presidential category. We rely on Robert Elgie's classification `http://www.semipresidentialism.com/` for these semi-presidential countries.

[8] We include the following eight countries as federal in the sample[9].

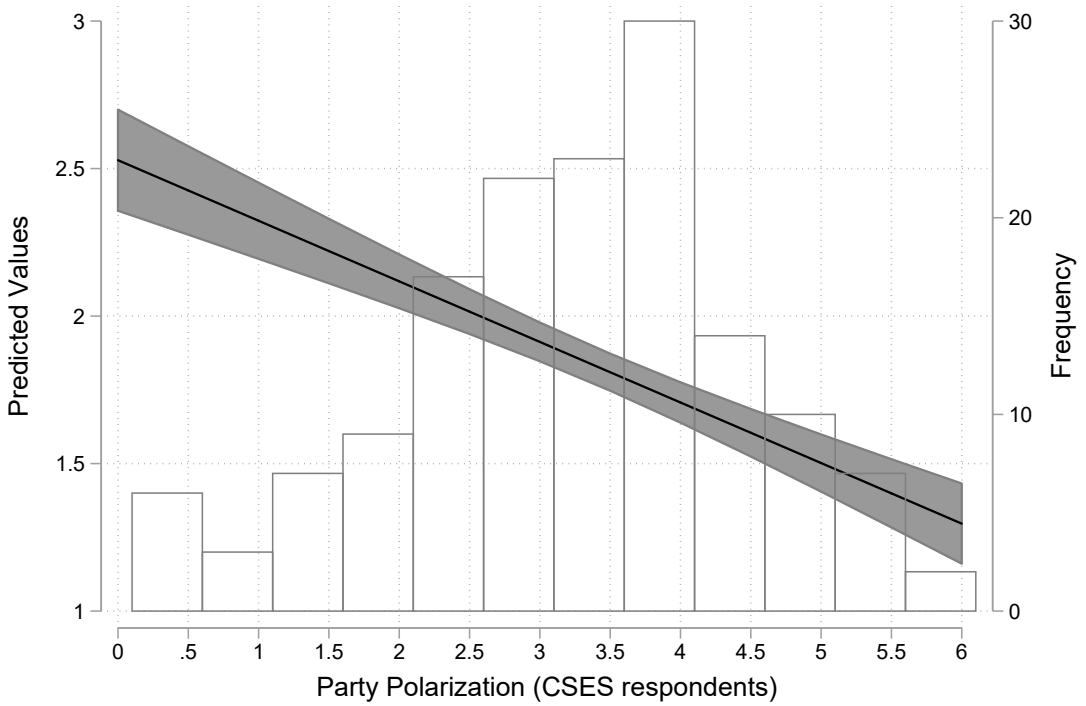
Table 1: Correlates of Left-Right Complexity

	(1)	(2)
Presidentialism	.016	-.090
	(.142)	(.108)
Federalism	.269*	.131
	(.122)	(.092)
Party Polarization		-.198***
		(.023)
Party Nationalization		-.496*
		(.201)
ENEP	.024	-.019
	(.018)	(.015)
New Democracy	.302**	.254**
	(.113)	(.085)
PR Elect. Sys.	-.163	.009
	(.146)	(.121)
Mixed Elect. Sys.	-.329*	-.217
	(.160)	(.124)
Turnout	-.234	-.135
	(.265)	(.205)
Stimuli=6	.033	.088
	(.067)	(.055)
Stimuli=7	.104	.174**
	(.081)	(.065)
Stimuli=8	.090	.212**
	(.086)	(.069)
Stimuli=9	.227*	.331***
	(.091)	(.072)
Constant	1.822***	2.844***
	(.242)	(.228)
ln(sd) Random Effect		
Constant	-1.297***	-1.685***
	(.136)	(.149)
ln(sd) Residuals		
Constant	-1.592***	-1.838***
	(.078)	(.079)
Observations	135	125
No. of Groups	49	42
log(likelihood)	-17.788	20.124

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 5: Predicted values of left-right complexity across values of Polarization



introduce the party nationalization measure, we find that the latter correlates with lower dimensionality and that this accounts for some of the variance associated with federalism. Party fragmentation, presidentialism, and turnout have no effect in these models.[10]

The strongest correlation is with polarization. Figure 5 indicates the substantive effect of the polarization on the effective number of dimensions. This effect is very large, with the most polarized systems having quite low complexity at about 1.3 and the least polarized having very high values, at 2.5. This suggests that the simplifying effects of polarization are evident in this measure [11]

[10] Although countries with 'mixed' electoral systems have slightly lower complexity in the first model, this relatively weak negative relationship likely does not stem from a causal factor related to the electoral formula since the two 'pure' cases (majoritarian and PR) are not differentiated from each other.

[11] Because of the potential for endogeneity of the CSES left-right polarization measure, we also examined this expert-based measure as a substitute. Lupu (2014) computes polarization following Dalton (2008) by calculating the standard deviation of the expert party positions generated in the CSES expert survey. Although this measure is available for a much smaller number of cases (89), we find very similar results with this approach.

The 'new democracy' variable also has a robust effect on left-right complexity as well, indicating the importance of established party systems in reducing left-right complexity. The change this variable results in large substantive changes in the dimensional complexity of left-right perceptions. This change is from 1.7 to 2 when comparing established and new democracies. Party system nationalization also has a similarly large effect. The dimensional complexity increases from 1.7 to 2.1 when comparing the low (5th percentile) and high (95th percentile) values of party system nationalization.

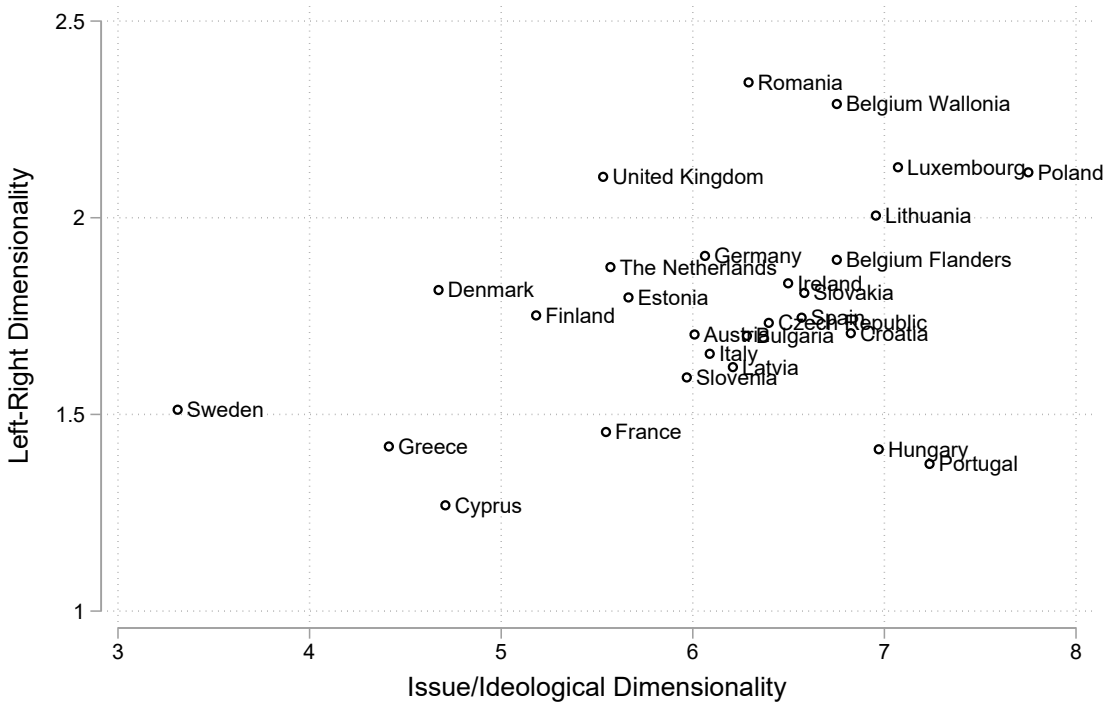
5 Extension: Relationship between left-right Complexity and Issue-based Ideological Dimensionality

As explained above, the left-right complexity we have discussed here is derived from responses to left-right placements of multiple parties and is not a deterministic function of the complexity of the *issue dimensions* present in a political system. For example, a party system might have salient economic and social dimensions that are not correlated, yet the left-right perceptions of party placements may be explained strongly by a single dimension. Across a range of issues, we can extract a latent measure of ideology that uncovers the dimensions of conflict across issues, as well as the degree to which each dimension explains the observed variance. This measures each dimension's underlying weight in explaining the array of voters' policy positions in the system– how well they overlap. To make this comparison, we use seven policy questions from the European Election Study (EES) 2014[12], as well as a left-right placement question in that survey similar to the one in the CSES. We can compare the dimensionality from left-right party placement and policy issues in 27 European countries.

First, we calculate the same Blackbox Transpose fit statistic used above for the left-

[12] http://europeanelectionstudies.net/

Figure 6: Issue/Ideology dimensionality vs left-right complexity (EES 2014)



right party placement in EES 2014. Second, we analyze 7 policy questions (state regulation and control of the market, redistribution of wealth, spending, civil liberties, immigration, EU integration, and environment) using the Blackbox scaling analysis (Poole, 1998; Saiegh, 2009; Poole et al., 2015). Blackbox scaling is identical in structure to Blackbox Transpose used above, with the exception that self placements on separate issue scales are treated as the stimuli, rather than various items being rated on the same scale. After recovering latent ideological dimensions from this approach, we compute the "effective number of dimensions" scores in the same way described above, producing a weighted index of each dimension's explanatory power via the explained sum of squared errors. The result is an issue-based measure of latent ideology dimensionality for the mass respondents. Figure 6 compares the two measures.

Overall we can see that left-right semantics can constrain the "natural" *policy* dimensionality of the political system, at least as defined by the ideological space captured by

the EES issue questions. The apparent tendency is for the highest left-right complexity to occur in cases where the latent ideology is also relatively high dimensional. This suggests that issue dimensions among the public raise the "baseline" for how much simplification the concepts of "left" and "right" can easily achieve. Among such cases, other factors would appear to mainly regulate whether the left-right concept results in an aggregate simplification, which we see occurring in a case like Portugal, but not in Romania.

6 Discussion

While left-right concepts provide a mechanism to simplify party positions and party competition space, these do not always capture a single concept. To assess this, we generate a measurement of the latent complexity of left-right perceptions based on fit statistics from scaling the party placement responses, which allows us to compare left-right complexity across countries and regions.

Using the Comparative Study of Electoral Systems (CSES), we examine the determinants of this dimensional complexity in a cross-regional sample, taking account of structural and institutional factors. As we have shown, in many countries, a single dimension of perception can not fully explain the left-right placement of parties. We find that this tends to be the case in less polarized systems, newer democracies with less established party systems, and less nationalized party systems.

Within a smaller sample of European countries covered by the 2014 European Election Survey, we are able to compare this to the issue space—the underlying dimensionality of latent mass ideology based on issue questions. Here, we find that the latent *ideological* complexity revealed by the issues in the respondent sample partly explains some of the baseline variance left-right complexity within this sample.

Our findings indicate that left-right heuristics vary in whether they "absorbed" the range of substantive conflicts as issue cleavages emerge in many cases. These concepts can

vary across citizens, such that these labels evoke more than one dimension of perception. Thus, although such survey responses appear structured as intrinsically unidimensional, the responses may reflect multiple dimensions of perception when responses across all party stimuli are considered. This can happen even when different concepts contributing to left-right, such as economic and social policy dimensions, are correlated.

These findings suggest that conclusions derived from applications of left-right perception data–such as party competition and congruence measures–can be affected by the complexity of left-right perception. Our findings especially suggest a reason to be cautious in comparing uses of left-right placements across newer and established democracies, but we also show that there are stark differences exist even among advanced democracies.

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