Legislative representation in a multilevel system: Mass-Elite Ideological Congruence in Brazil*

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Abstract

How well do legislative elites represent voters? Here, we examine voter-elite congruence in the context of Brazil’s federal system. We extend recent work on congruence with a study of voter-elite relationships using elite survey data from both the national congress and 12 Brazilian states from 2005-2014. We exploit the surveys’ common stimuli placing major parties and figures to estimate deputies and respondents’ ideal points on a common left-right scale using Bayesian Aldrich-McKelvey scaling. We show that, despite many barriers to ideological representation in Brazil, there is an overall congruence between voters and politicians’ ideological positions, and this is stronger for state deputies. However, while those indicating party support are better represented overall, the major right-wing parties deviated substantially from their supporters in the time under study. In our analysis considering the individual characteristics of deputies and voters, we further find that congruence was weakest for more educated deputies as well as for younger and more rural voters.

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Introduction

A great deal of research has examined whether political elites are successful as representative agents in aggregating voters’ preferences in elections. The ideological linkage between parties and government is central to the nature of political representation (Powell 2000; Huber and Powell 1994; Dalton and Anderson 2011). A core question within this topic is how ideologically close politicians are to their voters (Miller and Stokes 1963).

This voter-elite congruence may be distorted or disrupted by a variety of factors at the individual, party, and system levels. This might include matters related voters themselves, such as lacking the requisite knowledge to align with like-minded politicians (Jessee 2010; Lachat 2008; Kroh 2009) or related to politicians failing to represent those voters (Klingemann, Gancheva and Wessels 2017; Canes-Wrone, Brady and Cogan 2002; Rogers 2017). More broadly, the context can influence the ability of voters to identify their representatives (Carroll and Kubo 2018) as well as the incentives for politicians to represent them (Ferland 2018). For example, some work finds that more proportional electoral systems in advanced parliamentary democracies result in greater mass–elite ideological congruence (Huber and Powell 1994; Powell 2013). Others have shown important variation within countries, emphasizing, for instance, that elites align more with higher-income voters (Gilens, Phillips and Lax 2011; Gilens 2009). While voters in developing contexts tend to have less accurate left-right perception (Carroll and Kubo 2018), many scholars have found an overall pattern of ideological congruence in Latin America (Zechmeister and Corral 2013; Kitschelt et al. 2010; Saiegh 2015)—although this is stronger among more consolidated party systems (Luna and Zechmeister 2005). Among the less studied aspects of ideological representation is the role of federalism and subnational governments. Carroll and Kubo (2018) find, for example, that voters in federal nations have a systematically weaker ability to identify party positions. However, most studies of congruence tend to focus only on national-level representation, and there has
been little systematic accounting for subnational politics in representation outside of recent exceptions on the US (e.g., Tausanovitch and Warshaw 2013), in part due to data limitations. However, in federal nations like Brazil, the role of subnational governments touches upon virtually all aspects of politics. In Brazil, subnational politics has been widely shown to be at the core of competition for government resources (Ames 1995; Desposato and Scheiner 2008) and, consequently, for political careers (Samuels 2006; Desposato 2006). Subnational factors play a key role in accounts of the ideological weakness of Brazilian parties (Mainwaring 1991, 1999; Samuels 2003), implying that subnational effects are likely to exacerbate problems of ideological representation. Accounts of the precise nature of this impact vary. On the one hand, the independence of the actors in state political systems from the national arena is sometimes said to undermine the overall party system, by encouraging subnational factions (Desposato 2004; Mainwaring 1999). On the other hand, it is commonly thought that state politics in Brazil is organized around the opportunistic pursuit of resources and power, leading to incoherent parties even at the state level (Desposato and Scheiner 2008; Samuels 2003). Thus, whether the state-level elites are providing ideological representation to the mass electorate is an important question for Brazilian politics.

This study focuses on overcoming several methodological issues pertinent to examining ideological representation—specifically, congruence—in the Brazilian case. First, most work on congruence, usually focused on advanced democracies in Europe, uses expert or public perceptions of parties or their campaign messaging (i.e., manifestos) to provide the elite measures to compare to public preferences (Boonen, Pedersen and Hooghe 2017; Klingemann, Gancheva and Wessels 2017; Thomassen 2005; Klingemann 2009; Dalton, Farrell and McAllister 2011; Carlin, Singer and Zechmeister 2015). Some important exceptions, notably (Belchior 2013; Belchior, Tsatsanis and Teixeira 2016), have used elite surveys to link politicians’ views to voters, thereby establishing whether legislators individually and collectively represent their voters. This approach is particularly important in weaker party systems such
as Brazil, where the notion of parties serving as unified actors is less plausible, and
where individual deputies play a key role in shaping the de facto ideological profile
of parties. We, therefore, focus on elite surveys as a means to capture elite ideology,
aggregating from data derived directly from individual legislators and not the party
as a whole.

Second, to measure congruence, politicians at various levels must be measured
on a common scale along with voters. Joint scaling—obtaining latent properties of
measures from several different surveys’ data—is a typical way to obtain measures
for the linkage of politicians and voters (e.g., Gerber and Lewis 2004; Lewis and
Tausanovitch 2015; Clinton 2006; Saiegh 2015). We follow this approach by unifying
mass survey data with national and state-level elite survey data in Brazil. While the
survey data presents a considerable opportunity to compare preferences, using it in
this fashion requires addressing an important methodological issue in interpreting
left-right response data. Scholars studying mass-elite linkages often assume that
ideological positions based on “left” and “right” placements can be directly com-
pared, at least within a survey. This creates the problem of distortions created by
bias in the perception of each respondent concerning the left-right concept itself,
known as Differential Item Functioning (DIF) (Brady 1985, 1989). This results from
perceptual differences among respondents within a given survey, but is especially
problematic when, as in this study, there are such differences across respondents in
multiple surveys. To address biases in the perception of left-right stimuli, and to
facilitate “bridging” across surveys, we use Aldrich-McKelvey Scaling (Aldrich and
McKelvey 1977; Hare et al. 2015). This method allows us to adjust for bias in left-
right placements by using a set of common items rated by all types of respondents
(mass, national and state elites), which include presidential candidates and national
parties. We specifically make use of Hare et al. (2015)’s Bayesian Aldrich-McKelvey
approach, which handles the missing data necessarily created by sparse the matrices
inherent in joint scaling.

With these ideological scores obtained, we discuss two approaches to measuring
congruence, following recent literature. First, we examine the general “overlap” between the distribution of ideological preferences of elites and masses to assess the presence of bias. Second, we generate dyadic data that allows us to explore the correlates of incongruence more precisely.

We apply these measures to the question of how well state and national Brazilian elites have ideologically represented the mass electorate and identify the source of some possible distortions, using several voter and deputy characteristics. Overall, we find a quite high general congruence between the left-right positions of legislative elites and the mass electorate, but substantial exceptions with regard to mass-elite congruence between each party and its supporters. Most notably, supporters of right wing parties were substantially to the right of the deputies during this time.

Interestingly, state-level deputies appear to be slightly more aligned with citizens overall. In terms of individual characteristics, deputies that have more education tend to be the most distant from voters, while older and urban voters tend to have an advantage in ideological representation. While these findings are preliminary, we argue that our approach has the potential to contribute to our understanding of the ideological coherence of the Brazilian party system.

**Studying Ideological Congruence**

Since the classic work of Miller and Stokes (1963) on constituency-legislator representation, many studies have empirically examined how parties and politicians represent voters’ preferences focusing on the context of congruence between politicians and voters. In European democracies, a large literature deals with individual party-voter linkages and directly assesses congruence between parties and their voters on a left-right spectrum (Boonen, Pedersen and Hooghe 2017; Klingemann, Gancheva and Wessels 2017; Thomassen 2005; Klingemann 2009; Dalton, Farrell and McAllister 2011; Carlin, Singer and Zechmeister 2015). Meanwhile, much recent work is interested in the related question of preference gaps between types of voters
and elites in policymaking (Page, Bartels and Seawright 2013; Gilens 2009; Gilens, Phillips and Lax 2011).

There has been much less work on legislative congruence focused on developing countries and on the presidential systems of Latin America in particular. Three key exceptions contribute to our point of departure in this study. Saiegh (2015) uses elite and mass survey data to examine the congruence between voters and national elites across a range of Latin American countries. Boas and Smith (2014) examine descriptive representation at the national level in Brazil using various demographics, such as race. Lupu and Warner (2017) focus on Argentina and provide an analysis of ideological representation at the national level.

We examine congruence in several ways. First, we evaluate overall, system-level, congruence. While much work on the topic focuses on ideological distance between representatives and the majority of citizens, recent work by Golder and Stramski (2010) notes that proximity—the distance between means of mass and elite groups—fails to capture the overall degree of representation of interests within mass electorate or subgroups. We make use of an approach suggested by Golder and Stramski (2010) and Andeweg (2011) of a “many-to-many” congruence, based on comparing mass and elite distributions of responses, better captures the spirit of congruence envisioned by Miller and Stokes (1963).

Second, we are interested in establishing the degree to which parties and their supporters align (Giger and Lefkofridi 2014; Bos, Toshkov and Krouwel N.d.; Hölting 2017). Thus we consider the degree of partisan congruence – between parties’ state and federal delegations, on the one hand, and their supporters or voters on the other – by comparing the distributions of ideal points within these subsets.

Finally, while comparing aggregate distributions provides a useful general overall impression of bias, this idea can also be generalized to a statistical analysis using a dyadic approach, including distances between all individual mass and elite respondents, such as that employed by Boas and Smith (2014). This approach allows us to simultaneously consider voter and elite characteristics as possible sources of bias in
Electoral linkages in Brazil

Brazil is typical of the third-wave democracies in Latin America, where authoritarian governments and institutional instability characterized much of the twentieth century. However, Brazil constitutes a vast territory, with more than 200 million inhabitants distributed among 26 states and a capital district. The federal system also gives considerable powers to subnational governments and is marked by substantial socioeconomic inequalities between regions, especially between wealthier states in the Southeast and less developed states in the North and Northeast of the country. For this reason, Brazil allows us to examine the ideological congruence between representatives and voters in a party system where fully nationalized ideological competition has not been the norm.

In addition, existing literature implies that weak ideological congruence may exist between politicians and voters in Brazil for several reasons. First, politics is highly candidate-centered, in part because of an open-list proportional system to elect both national and state deputies. This system is widely argued to encourage individual competition among copartisan candidates (Carey and Shugart 1995; Ames 1995b). In this system, seats are allocated to electoral lists, but distributed among the candidates with the highest votes within the lists. In this way, large numbers of candidates from the same list compete with each other (Ames 1995b). With this intraparty competition, candidates organize their campaigns and do not rely on their parties for electoral resources. Thus, since parties lack control over the electoral process, ideology is thought to play a weaker role to voters in legislative elections in Brazil, relative to candidates’ behavior, characteristics, or reputation. The personalization of politics may further vary due to the malapportionment of the Chamber of Deputies (Samuels and Snyder 2001). In states like Roraima, each national deputy represents about 40,000 voters, while in São Paulo, this is about 450,000, which may or may
not encourage broader representation Ames (2002). For these reasons and others, the electoral system may hinder assemblies tendency to reflect the preferences of their voters in some states, while facilitating the election of legislators representing minority groups in others.

Another factor linked to the electoral system is the high party fragmentation in the country. To win seats, parties that run candidates in legislative elections need to get more votes than the electoral quotient. For those parties that cannot reach this threshold, the electoral system allows them to form electoral coalitions (Calvo, Guarnieri and Limongi 2015). As long as small parties have attractive candidates and run under an alliance, they can win seats with the support of votes won by their coalition partners. As Brazil has more than 30 registered parties, elections usually involve electoral coalitions with several parties, often with distant ideological platforms, which facilitates the election of small parties with ideological profiles likely unknown to voters.

Third, and most directly, the Brazilian party system is often characterized as having mostly non-programmatic parties. With the partial exception of the Brazilian Workers Party (PT)–the major left-wing party founded by the organized labor and progressive intellectuals that held the Presidency from 2003 to 2016 (Samuels 2004)–most parties are not thought to have a core of ideological supporters, and party identification is generally weak (Mainwaring 1999; Samuels 2006). Consistent with this view, legislative candidates both at the national and state levels often employ non-programmatic electoral strategies to win votes, ranging from recruiting local brokers to offering employment and resources to individuals and groups of voters Samuels (2003); Ames (2002). In addition, party-switching remains common in Brazil. ¹ This is often seen as a strategy to pursue resources for reelection prospects (Desposato 2006). Clearly, these patterns suggest a strong potential for parties to be composed of members with little ideological connection to their electorates. While

¹For example, in 2018 alone, about 80 out of 513 federal deputies have switched parties before the end of their mandates.
some work has attempted to find evidence of greater programmatic consistency (Hagopian, Gervasoni and Moraes 2009), other work has suggested little overall growth in the degree of ideological content among parties (Lucas and Samuels 2010).

In summary, individual competition between candidates, party fragmentation, and widespread non-programmatic politics may prevent voters from electing representatives with ideological views similar to theirs. Moreover, as the previous discussion also highlights, there are good reasons to expect that the ideological congruence would vary between states and the level of representation—the national chamber and state assemblies. Given the litany of challenges to ideological representation identified in the literature, investigating the extent to which the Brazilian party system has produced congruence between legislators and voters remains important, and it is particularly crucial to take into account state assemblies in answering this question as potential mechanisms for this representation.

**Studying ideological congruence in Brazil**

**Data**

To analyze the ideological congruence between politicians and voters in Brazil, we make use of an original dataset that combines information from several surveys of national, state legislators and voters between 2006 and 2014. The legislative surveys were conducted face-to-face by the Center for Legislative Studies (CEL) from UFMG, including representative samples of national deputies elected in 2002, 2006, and 2010; and state deputies in twelve Brazilian states. The twelve state legislative surveys cover all regions and vary in demographic and economic backgrounds: Bahia, Ceará, and Pernambuco (Northeast); Tocantins and Pará (North); Goiás and Mato Grosso (Central-west); Rio de Janeiro, São Paulo, and Minas Gerais (Southeast); Santa Catarina and Rio Grande do Sul (South). The samples in each state were also drawn to be representative of the chambers as a whole. That is, interviews are
based on subsets but designed so that the final samples would reflect as close as possible characteristics random samples of national and state deputies—in the latter, in the states the survey was carried out (Nunes 2012). For our purpose, this also has the advantage of using the same methodology to survey both national and state deputies.

Information on voters is based on three waves of the Comparative Study of Electoral Systems (CSES) in Brazil. In this case, surveys were conducted just after national and state elections in 2006, 2010, and 2014, and are representative of the Brazilian voting-eligible population. This is useful because it contains questions requesting voters to position themselves, parties, and political figures all on a common left-right scale ranging from 0 to 10. A similar question, including common questions on parties and figures, is also available in each of the legislative surveys we employ. We exploit this feature in order to be able to compare politicians and voters’ ideological positions. Table 1 reports information on each of the seven surveys included in the final dataset, including the dates and number of observations, as well as the means and standard deviation of the raw self-reported ideological position of respondents on the ten-point scale. Taking these descriptive statistics at face value, it would appear that that deputies are systematically more to the left in the ideological spectrum than Brazilian voters. However, because of the definitional ambiguity of the terms, these data also suffer from the lack of direct comparability within and between surveys in terms of perceptions. We attempt to address this problem in the next section.

Measurement strategy

Naturally, an important challenge for comparing mass and elite preferences has been obtaining comparable estimates of voters’ and elites’ policy positions (Lewis and Tausanovitch 2015; Tausanovitch and Warshaw 2013). A significant problem for comparing ideological positions among politicians and voters is the phenomenon of
Differential Item Functioning (DIF). For various reasons, respondents may interpret ideological scales in different ways, distorting distances between stimuli—or even ordering them in an opposite fashion. A typical example of this problem is cases when respondents with radical ideological views classify themselves as moderates and moderates as extremist, pushing stimuli to the endpoints of the scale (Hare et al. 2015). In the presence of this problem, comparing raw self-reported ideology of politicians and voters—or even among groups of voters—may lead to measurement error.

Our measurement strategy to deal with DIF problems consists of using the common stimuli among respondents as “bridges” to correct their distortion and bias parameters. This allows us to get bias-corrected estimates of their ideal points. Specifically, as all questionnaires include questions on the position of the main Brazilian parties and some political figures, such as presidential candidates and former presidents, we use these as inputs to implement Bayesian Aldrich-McKelvey scaling. Assuming that the respondent $i$ placement of the stimuli (parties and political figures) $j$ is a linear combination of the true position of $j$ and the bias and distortion parameters, we can recover the true stimuli positions with the following model:
\[ z_{ij} = \alpha_i + \beta_i \delta_j + u_{ij} \]  

(1)

Where \( \alpha \) estimates the ‘shift’ that respondent \( i \) applies to stimulus, pushing them away or toward to the extremes of the scale; \( \beta \) (sometimes called ‘weight’) estimates the distortion in the scale, where negative values indicate that respondent \( i \) places the stimulus opposite where they are estimated to be; and \( u_{ij} \) is an error term with mean zero and positive variance. In the same way, \( z_{ij} \) is the raw placement of the stimuli \( j \) made by respondent \( i \), while \( \delta \) recovers the true position of the same stimuli. Using a Bayesian simulation approach, we can solve for \( \alpha_i, \beta_i, \) and \( \delta_j \) simultaneously and, then, using the first two parameters to estimate the true self-placement of respondent \( i, x_i, \) in a common basic space: 

\[ x_i = \frac{z_{i(\text{self})} - \alpha_i}{\beta_i} \]  

(5)

We estimate the model using the Bayesian approach described by Hare et al. (2015). The main benefit of using this Bayesian approach is that missing data can be handled by the process, which is not possible in traditional implementations of Aldrich-McKelvey scaling (Poole et al. 2016; Aldrich and McKelvey 1977). For stimuli positions, normal priors are assumed (i.e., \( \delta_j \sim N(0, 1) \)). We also use uninformative priors for the individual distortion parameters.\(^3\)

\(^3\)Specifically, the priors are specified as follows:

\[ \alpha_i \sim U(-100, 100) \]  

(6)

\[ \beta_i \sim U(-100, 100) \]  

(7)

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\(^2\)The placement of the stimuli \( j \) by respondent \( i \) is assumed to be distributed as follows:

\[ z_{ij} \sim N(\mu_{ij}, \tau_{ij}) \]  

(2)

\[ \mu_{ij} = \alpha_i + \beta_i \delta_j \]  

(3)

\[ \tau_{ij} = \tau_i \tau_j \]  

(4)
Identification is achieved by constraining the position of two stimuli in the left and right extremes of the scale. In particular, we constrained the position of the leftist PT stimulus to lie between -1.1 and -0.9 and Brazilian Democrats (DEM), usually known to be the farthest right large party, to lie between 0.9 and -1.1.\(^4\) To estimate the model, we use MCMC simulations\(^5\).

We use these bias-corrected self-placements of mass and elite respondents in our analysis below of the ideological congruence between politicians and voters in Brazil.\(^6\)

## Results

### The congruence between politicians and voters

We begin by analyzing the extent to which deputies in Brazilian assemblies share the ideological preferences of voters in general. Figure 1 plots the density distribution of corrected ideal points of national and state deputies together, in black, and voters in gray. In general, the pattern suggests that politicians and voters have remarkably similar ideological distributions overall, suggesting that the Brazilian party system lacks any consistent, systematic bias. However, there is some misalignment between deputies and voters, as the former are located somewhat more to the left of voters, even with the bias-corrected data. Finally, we note that the overall distribution of voters’ ideal points shows that the electorate is somewhat bimodal, indicating a degree of polarization rather than entirely a centrist clustering pattern.

\(^4\)Note that these constraints do not affect the respondent ideal points for respondents associated with either party, as these constraints refer only to the common stimuli used as a benchmark for bias adjustment. These stimuli estimates are not directly used in our analysis.

\(^5\)This is done via the JAGS (i.e., Just Another Gibbs Sampler) in the package \texttt{rjags}, running two chains with 50000 iterations as a burn-in period, using the summary of other 2500 iterations to the analysis. Following the best practices, we examine the chains using Gelman-Rubin diagnostic and by reviewing the unimodality of the posterior distributions. Both confirm that the chains achieved convergence.

\(^6\)The recovered positions of the stimulus are largely similar to the ones for national deputies alone estimated by \textit{Zucco (2009)}, corroborating the face validity of our measure of ideology to study congruence between politicians and voters in Brazil. See the appendix for a discussion of the face validity of the estimates.
As noted above, to examine ideological congruence in Brazil in more detail, we must compare the distributions of political preferences. Because a comparison of means or medians fails to account for the potential for individuals to be represented by the overall distribution of elite preferences, we employ a “many-to-many” measure of congruence to compare politicians’ and voters’ ideological preferences. The measure we employ first is a straightforward notion of “overlap.” Specifically, given the density function of the distribution of ideological positions of deputies, i.e., \( f(\text{deputies}) \) and voters, i.e., \( f(\text{voters}) \), in Brazil, we calculate the overlap as the area lying under both of the density curves:

\[
\Delta(\text{deputies, voters}) = \int \min\{f(\text{deputies}), f(\text{voters})\} \, dx
\]

where \( \Delta \) is the congruence coefficient ranging from 0 to 1, where one 1 indicates perfect overlap. This metric allows us to measure the ideological congruence between our samples of deputies and voters, reported in Table 2. In line with the previous plot, we can see that ideological congruence is overall very high in Brazil. In both

\footnote{We use the \texttt{R} package \texttt{overlap} to estimate the overlap between the density functions.}
Table 2: Overlap between deputies and voters’ ideal points

<table>
<thead>
<tr>
<th>Voters</th>
<th>All states</th>
<th>12 states (state survey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National and state deputies</td>
<td>0.859</td>
<td>0.865</td>
</tr>
<tr>
<td>National deputies</td>
<td>0.822</td>
<td>0.809</td>
</tr>
<tr>
<td>State deputies</td>
<td>0.886</td>
<td>0.894</td>
</tr>
</tbody>
</table>

the full sample and the 12 states included in the CEL surveys of state deputies, the estimated congruence between deputies and voters is equivalent to 0.85. On the other hand, national deputies alone appear to have ideological positions slightly more distant to that of voters.

**Ideological congruence by party**

So far, we have analyzed the aggregate ideological congruence between deputies and voters in Brazil. In this section, we investigate in more detail the five biggest parties in Brazil: Workers Party (PT), the biggest in the center-left that is also considered the most programmatic in the country; the PMDB, a centrist party that took part in every government coalition since re-democratization; DEM and PP, both center-right parties rooted in the Brazil’s Northeast and South, respectively; and the PSDB, the main PT’s national contender on the center-right between 1994 and 2014. PT and PSDB also had the country’s Presidency between 1994 and 2016, with the support of the PMDB.

In Figure 2, we plot the density distributions of ideal points of deputies from each of those parties, as well as their party supporters (i.e., voters that declared feeling close to them) and non-supporters.
We see that PT supporters are clearly better represented than their voters both for state and federal deputies. While the left-wing PT represents well its identified supporters and has a very narrow variance, it is less congruent with its voters overall, which are dispersed and more centrist. Meanwhile, the center-right PSDB and far-right DEM show an opposite pattern, representing its overall voter base but highly incongruent with its much more right-wing group of self-identifiers. Similarly, the PMDB differs more from its highly dispersed and relatively conservative supporters
than voters. These patterns are further verified in a statistical analysis shown in the appendix.

While providing a useful overview of the data, this approach has two major limitations. First, it does not provide any estimates of uncertainty by which we can distinguish key factors, and, second, it does not allow us to compare subgroups of deputies and voters easily. To address these limitations, we follow Lupu and Warner (2017) and Boas and Smith (2014) and adopt a more flexible approach to study elite-voter congruence: dyadic analysis. As is common in other fields of research, this method consists of comparing all possible pairs of observations in our sample, in this case, all deputy-voter dyads. In this sense, this approach mimics the “many-to-many” congruence comparison used above and in previous studies – but has the advantage of evaluating the statistical properties of congruence the evaluation of the role both mass and elite respondent characteristics, as well as common characteristics between the two. Notes that this approach, however, captures overall deviations, and does not distinguish between left and right divergence.

We estimate dyadic models using random-effects. As a first step, we created a new dataset with all the unique pairs between deputies and voters in our sample. Then, we calculate a measure of the ideological distance between both that is equal to the absolute distance between their ideal points. To ease the interpretation of results, we rescaled this variable to the unit interval, thus making its interpretation straightforward: values close to 0 indicate a deputy-voter pair in which the two are on opposite extremes of the left-right ideological space, where values close to 1 indicate the deputy-voter have nearly identical ideal points. In practice, the observed mean distance is only about .06. With this dependent variable, we estimate the following equations:

\[ Y_{ij} = \alpha_i + \alpha_j + \beta X_{ij} + \epsilon_{ij} \]  \( \text{(9)} \)
\[ \alpha_i \sim N(0, \sigma^2_{\alpha_i}) \] (10)

\[ \alpha_j \sim N(0, \sigma^2_{\alpha_j}) \] (11)

\[ \epsilon_{ij} \sim N(0, \sigma^2) \] (12)

where \( \alpha_i \) and \( \alpha_j \) are random effects for voters and deputies, respectively; \( X_{ij} \) is a matrix of independent variables used to compare subgroups of deputies and voters; and \( Y_{ij} \) is our dependent variable, measure for each pair of deputy-voter. Figure 3 plots the results of a model, including all the data and several covariates relating to deputies, voters, and pairs. Since the dependent variable is a distance, positive values indicate less congruence, and negative values indicate more congruence. As of this writing, we can currently include elite characteristics of state deputies such as gender, age, education, and income. For voters, we include age, gender, education, income, and whether the respondent identifies as a party supporter for the party of the elite respondent, among others. Finally, we include two dyad-level variables, \textit{Same state} and \textit{Same Gender}, indicating that both deputy \( j \) and voter \( i \) share the same state or gender.

First, unsurprisingly if reassuringly, the results show that legislators, in general, have more similar preferences to their party supporters (i.e., voters that declared feeling close to the party of the deputy \( j \)) compared to non-supporters.

More interesting is the corroboration of the general pattern noted above, that state deputies are, on average, more congruent with voters’ ideological preferences than national deputies. This finding supports the idea that the state level may be more of a focus of representation and responsiveness than typically thought. Somewhat surprisingly, however, this tendency is not higher in dyads where the deputy is within the same state. This suggests that there are not unique ideological variants
within states that correspond better to citizens from those states, despite that state deputies as a whole have an ideological distribution more congruent with voters.

With regard to deputy characteristics, we find that only one of them, having a college degree, has a positive and significant effect, indicating that more educated national deputies are somewhat less representative voters. This finding suggests that relatively more elite deputy backgrounds are associated with deviations from voters. However, it is noteworthy that no effect is found with regard to deputy income. Several aspects of voters’ characteristics are consistently relevant. Specifically, older voters and urban voters are better represented by legislators. Interestingly, non-white voters were slightly better represented at this time as well.

Figure 3: Estimates of ideological distance between deputies and voters

[Graph showing ideological distance estimates for various characteristics]
To incorporate partisan elements into the dyadic approach, we use a simplified set of variables from the model above and include four party variables for voters and deputies, focusing on the two major parties at the time, PT and PSDB. In Figure 4, we show the coefficients from this model. The results verify that the supporters of PT have much greater congruence than those of PSDB in general, confirming further the finding shown in Figure 2. Interestingly, this is driven mainly by the voter side for PSDB, meaning that the PSDB deputies were not especially incongruent with voters in general, yet their own supporters systematically lacked congruent representation. For PT, by contrast, there was a higher degree of congruence both for dyads with PT deputies (relative to other parties) and for dyads with PT supporters (relative to other voters).

![Figure 4: Ideological congruence in Brazil](image)

To explore the variation across states, we next disaggregate the data and examine state subsamples. In Figure 5, we run separate models for each state focusing on only...
two of more influential factors above – party supporter and state deputy – including only deputy-voter pairs (national and state) in each of the 12 states surveyed in the CEL’s state legislative questionnaire. The intercepts of the models indicate the average distance in each state. There is variation across states, but many are nearly the same as the 0.05 mean dyadic distance seen at the national level. The general pattern of state deputies being more ideologically congruent is present only in certain states, and in one state (Tocantins) is even fully reversed.

The seemingly straightforward party supporter effect also varies considerably, being extremely strong in some states (e.g., Bahia). In two (Mato Grosso and Goias), remarkably, deputies are no closer to their supporters than they are to other respondents. These cases are most in line with the conventional expectations of generally weak ideological foundations of Brazilian parties.

Figure 5: Ideological congruence by state in Brazil
Discussion

We take a first step toward examining voter-elite congruence in the multi-level context of Brazil’s federal system. We extend recent work on congruence by including an unprecedented amount of elite survey data from 12 Brazilian states into a unified study of voter-elite relationships. Exploiting the fact that these surveys include questions asking respondents to place major Brazilian parties and figures and themselves in a left-right ideological scale, we are able to obtain estimates of deputies and respondents’ ideal points on a common scale.

We show that even in the fragmented Brazilian party system, voters and politicians’ ideological positions are largely congruent overall, and particularly between voters state deputies. However, we find that this is less clear within the major parties. While the left-wing PT represents well its identified supporters and has a very narrow variance, it is less congruent with its voters overall, which are dispersed and more centrist. Meanwhile, the center-right PSDB and far-right DEM show an opposite pattern, representing their overall voter bases but highly incongruent with its much more right-wing group of self-identifiers. Similarly, the PMDB differs more from its highly dispersed and relatively conservative supporters than voters.

In our dyadic analysis, we offer some preliminary results regarding some of the specific determinants of deviations from congruence. We again verify that state deputies are less distant from voters and show that party supporters are closer on average. However, we also find that higher educated are among those least congruent with voters and that older and urban voters are the best represented. In addition, the dyadic analysis further confirms that PSDB supporters were systematically ideologically unrepresented.

As a whole, while we find a relatively representative system at both the state and national levels, our results should not be taken to indicate a strong ideological consistency in the nature of party representation, and especially not one that voters would necessarily recognize. In general, there was a leftward bias relative to voters
in the time under study. In particular, this appears to have been driven by two patterns visible when taking into account parties: those who voted PT (but did not identify as PT), as well as those who identified with the largest right-wing parties, had systematically weaker congruence. In future versions of this work, we will examine the possibility that this led to measurable discontent among these groups and possibly facilitated the dealignment of the party system in 2018.

At this stage in this project, we have focused mainly on developing the infrastructure to incorporate the multi-level Brazilian context into the study of congruence and reporting descriptive patterns of this exercise. In future iterations of this paper, we will add a fuller array of covariates for the dyadic analysis, with the possibility of obtaining a comprehensive evaluation of possible characteristics regulating congruence.
References


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Appendix

Question wordings

We present the specific survey question wordings used to obtain the ideological self-placements and placements of political stimuli from elites and voters below. Despite minor differences in word choice and details provided, the surveys we include in our sample employed similar questions to obtain ideological placements. As mentioned in the main text, however, the major difference between CEL and CSES is that the former uses a scale from 1 to 10 and, the latter, from 0 to 10. Following Saiegh (2015), we transformed the CSES responses to range from 1 to 10, recoding all 0 to 1.

- **Deputies (CEL state and national deputies):** When one talks about politics, expressions like left and right are sometimes used. In a scale where 1 means left and 10 means right, where would you place the following political parties? [a card was used to indicate the parties]

- **Deputies (CEL state and national deputies):** Now, taking into account your own political preferences, where would you place yourself in the scale where 1 means left and 10 means right?

- **Voters (CSES 2006):** In politics people sometimes talk of left and right. Where would you place the [party] on a scale from 0 to 10 where 0 means the left and 10 means the right?

- **Voters (CSES 2006):** ... And continuing thinking about left and right, where would you place yourself on this scale (where 0 means the left and 10 means the right)?

- **Voters (CSES 2010 and 2014, translated from the original in Portuguese):** In politics people sometimes talk of left and right. In a scale where 0 means left and 10 means right [a card with the scale was used by the interviewer], I would like that you use this scale to tell whether each one of the political parties I’m going to cite to you belongs to the left or to the right. In case I cite a political party you don’t know, you can tell me that. So, how do you classify the following parties.

- **Voters (CSES 2010 and 2014, translated from the original in Portuguese):** ... And continuing thinking about left and right, where would you place yourself on this scale (where 0 means the left and 10 means the right)?

Political stimuli locations

As a result of the Bayesian Aldrich-McKelvey application, we are able to estimate the location of the stimuli used to place elites and voters in a common space. In Figure 6, we plot these stimuli estimated locations and their 95% confidence intervals. Reassuringly, the order of the stimuli has great face-validity, clearly distinguishing

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8 Note that the CEL’s surveys consistently used the same wordings in each one of its waves both for national and state deputies.

between center-left parties such as PT and PDT (Democratic Labour Party) and center-right ones, such as DEM and PP. In addition, one can clearly see that the placements of former presidents Lula and Dilma Rousseff overlap with that of PT.

Figure 6: Stimuli location

Validation of ideological estimates

Even though the stimuli location we presented in Figure 6 adds to the evidence that our BAM exercise was able to recover unbiased estimates of elite and voters’ ideal points, here we conduct a different validation test. The widely-cited work of Zucco (2009) uses a different approach, combining survey and legislative roll call data, covering a different period (2007-2010). Here, we compare the estimated locations of Brazilian political parties of Zucco (2009) to our own in a scatter plot, shown in Figure 7. There is a positive relationship between the two classifications, despite the different approach.
Figure 7: Correlation between BLS and CSES/CEL stimuli locations
Table 3: Elected and surveyed national deputies by party in the sample

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>16.2</td>
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<td>0.8</td>
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Elite sample

Figure 8: Elected and surveyed state deputies by party in the sample

Descriptive statistics

Dyadic analysis by party

Here, we explore the statistical strength of the patterns visually described in Figure 3. We once again use our dyadic approach to investigate the ideological congruence of deputies and voters in the three largest parties, each of which provides sufficient data to do so. Here, we are comparing all voters solely to the deputies from the three parties in question (PT, PMDB, and PSDB) to see the variance in the performance of the supporter variable from our earlier dyadic analysis. We see clearer evidence of the pattern indicated above by Figure 3: PT supporters are clearly better represented than their voters, while PSDB (and to a slight extent, PMDB) actually represents voters overall better than they represent their own identified
Table 4: Descriptive statistics

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<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Pctl(25)</th>
<th>Pctl(75)</th>
<th>Max</th>
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<tbody>
<tr>
<td>Ideal points (deputy)</td>
<td>8,013,616</td>
<td>-0.43</td>
<td>1.22</td>
<td>-15.03</td>
<td>-0.96</td>
<td>0.13</td>
<td>4.82</td>
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<td>Self-reported ideology (deputy)</td>
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<td>4.58</td>
<td>2.10</td>
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<td>3.00</td>
<td>6.00</td>
<td>10.00</td>
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<td>Female (deputy)</td>
<td>8,209,968</td>
<td>0.11</td>
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<tr>
<td>Age (deputy, log)</td>
<td>8,209,968</td>
<td>3.91</td>
<td>0.23</td>
<td>3.09</td>
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<td>4.06</td>
<td>4.60</td>
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<td>Top income (deputy)</td>
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<td>0.00</td>
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<td>0</td>
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<td>State deputy</td>
<td>3,654,078</td>
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<td>1.46</td>
<td>-9.39</td>
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<td>0.78</td>
<td>9.61</td>
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<td>5.00</td>
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<tr>
<td>Self-reported ideology (voter)</td>
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<tr>
<td>Female (voter)</td>
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<td>3.63</td>
<td>0.41</td>
<td>2.77</td>
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<td>3.97</td>
<td>6.91</td>
</tr>
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<td>0.15</td>
<td>0.36</td>
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</tr>
<tr>
<td>Top income (voter)</td>
<td>8,209,968</td>
<td>0.11</td>
<td>0.31</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
<td>College (voter)</td>
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<td>Highschool (voter)</td>
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<td>Union member (voter)</td>
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<td>1</td>
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<td>0.48</td>
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<td>0.06</td>
<td>0.00</td>
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<td>1.00</td>
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</table>
We next examine the congruence coefficient by party. Here we take the same approach, looking at each party and the voters for that party, now examining two smaller parties, DEM and PP. Here we can measure the ideological congruence between the samples of deputies and voters within each of these parties, which is reported in Table 2. First, we note that here we see a clear variation in the extent to which voters are represented by their own party. The traditional major parties, PSDB and PT, highlighted in the figure above, have much lower overlaps relative to the other parties, even the ideologically ambiguous PMDB.

<table>
<thead>
<tr>
<th>Party</th>
<th>National Deputies</th>
<th>State Deputies</th>
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</thead>
<tbody>
<tr>
<td>PT</td>
<td>0.604</td>
<td>0.609</td>
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<tr>
<td>PMDB</td>
<td>0.761</td>
<td>0.744</td>
</tr>
<tr>
<td>PSDB</td>
<td>0.565</td>
<td>0.62</td>
</tr>
<tr>
<td>DEM</td>
<td>0.813</td>
<td>0.852</td>
</tr>
<tr>
<td>PP</td>
<td>0.707</td>
<td>0.578</td>
</tr>
</tbody>
</table>

**Effects of Missing data**

Since our dyadic sample contains a considerable number of missing observations in the dependent variable of ideological distance, we conduct a robustness test to check whether this drives our results. To that end, we inputted extreme values (0

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10While the state deputy effect seems inconsistent with the negative coefficient seen in the larger sample, note that here the nature of the sample makes this finding more difficult to obtain due to the baseline being voters for any party
and 1, the maximum and minimum ideological distances recorded in our data) and ran our full random-effects model with covariates.

Figure 10: Estimates of ideological distance between deputies and voters: Extreme bounds on missing