# Voter Expectations of Government Formation in Coalition Systems:

# The Importance of the Information Context

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## Abstract

Can voters in multi-party systems predict which coalition will form the government with any degree of accuracy? To date, studies which explore voter expectations of coalition formation have emphasized individual level attributes, such as education, but the complexity of the environment at the time the coalitions are forming should also be consequential in enabling (or handicapping) voters in forming expectations. We examine the relative effects of individual level attributes (e.g. education, cognitive mobilization) versus contextual factors (e.g. information availability) in 19 German state elections and 3 German general elections between 2009 and 2017. We find that the ease of identifiability of alternative future governments varies significantly across multi-party systems. We find that respondents are more likely to predict governments that they would like to see in office, that have a higher probability of receiving a majority of seats, and that consist of ideologically proximate parties. Combining survey data with a novel indicator of coalition signals, measured through a quantitative text analysis of newspaper coverage, we also find that voters consider positive pre-election coalition signals when predicting the government. Finally, we find that the information environment is much more relevant for correct coalition predictions than individual-level characteristics of respondents. While individual attributes do influence predictive ability, these factors are strongly dominated by the context in which the prediction is taking place. The information environment has by far the largest effect on predicting coalition outcomes. Our results have implications for the literature on strategic voting in multiparty settings, as well as the literature on accountability.

# Introduction

Are voters in multi-party systems good at predicting which coalition will form the government post-election? What factors help improve – or blunt – their accuracy? Representative democracy rests on the assumption that voters will have some sense of which government will form or, at a minimum, what the most likely alternatives are (Blais et al. 2006; Golder 2005; Powell 2000; Armstrong and Duch 2010). Since voters' expectations influence their vote choice the question about predictive accuracy is of relevance to strategic voting in multi-party systems (there is a sizable literature on strategic voting – see e.g. Aldrich et al. 2018; Gschwend & Meffert 2017; Irwen & Van Holsteyn 2012 for recent reviews). It is also of relevance to citizens who have an interest in knowing what policy outcomes will be pursued after the election (Armstrong & Duch 2010: 309). It is helpful, especially if strategic voting is a possibility, for voters to develop accurate expectations over what government will form (Meffert & Gschwend 2010, 2011; Meffert et al. 2011).

In coalition systems, forming expectations over who will be in government is more difficult for voters than in two-party contests. To date, studies of voters' coalition expectations have tended to emphasize individual voter level attributes and cognitive resources such as education or interest in politics (see e.g. Rasmussen et al. 2018; Meffert & Gschwend 2010, 2011; Meffert et al. 2011). While individual attributes are undoubtedly important, in this paper we argue that it is also the case that contextual factors, such as the availability of information, are likely to play a role. There are reasons to think that elements of the situation at the time the coalitions are forming should also be consequential. Put simply, in some situations it is easier for voters to form accurate expectations than under other circumstances. In situations where there is lots of information about the coalition actors, or where there are relatively few actors with stable vote shares, we might expect that observers would find it relatively easy to make correct predictions. But there are also contexts where there is less information (e.g. about party

intentions or polling performance) or where the party actors are changing (e.g. where aggregate vote shares are volatile – perhaps because of the entry of a new party).

When it comes to forming accurate expectations about which coalition government will form then one question becomes not whether these situational factors have an effect but whether they or individual level cognitive attributes (education, interest etc.) are ones that mostly shape the accuracy of voter expectations.

Our argument is that it is contextual or situational factors which dominate the formation of expectations: some coalitions are formed in situations where voters find it much easier to form accurate predictions than others, regardless of the individual's cognitive resources. There are times when the information environment is simply too sparse or too changeable for individuals to be able to make accurate predictions. On the other hand, there are times of stability and high information where it becomes much easier for voters to make accurate predictions.

The following study identifies what those situational factors are, and the extent to which they impact the expectations of voters relative to individual level attributes. We exploit the institutional similarity across the German states (Snyder 2001; Bowler et al. 2016; Hobolt & Hoerner 2020) to examine voter accuracy in coalition predictions across a range of coalition situations. Comparison across national elections will, necessarily, involve comparison across more than simply coalitional politics but will also involve comparison across institutional and cultural contexts. For instance, there will be variation in the electoral system used which will, in turn, affect the overall degree of proportionality, the presence or absence of legal thresholds varies by country and the party systems themselves will differ substantially (e.g. in terms of the number and size of electoral competitors or the presence of uncoalitionable parties). Additionally, countries will vary in terms of their economic development, democratic stability, and average educational attainment. A sub-national research design allows us to hold constant these potentially confounding factors and, at the same time, increase both the number of cases

and variation in coalitional context (see e.g. Bowler et al. 2016; Snyder 2001). We therefore analyze representative surveys conducted in 19 state elections and 3 general elections in Germany between 2009 and 2017. We combine these surveys with pre-electoral coalition signals in the media and aggregated pre-election opinion polls, which allows us to examine the information environment facing voters across a range of circumstances.

Our study draws two broad conclusions. First, many voters are able to make successful predictions. For example, arithmetically impossible coalitions or coalitions of ideologically distant parties are much less likely to be chosen as the predicted government. Second, the main drivers of the accuracy of voter predictions are indeed situational rather than individual level attributes. There are simply some settings in which voters find it easier to form expectations than others. The availability of opinion poll information, for example, helps voters to predict which government will form. Coalition signals by political parties also provide information that voters use in sensible and straightforward ways, in line with the kinds of ways we see in Fortunato et al. (2016). These points hold despite strong and robust evidence of "wishful thinking" on the part of individual voters when predicting which government will form. Second, the analysis of 22 elections enables us to disentangle the importance of the information environment and individual-level attributes. We find strong and robust evidence that the information environment, for instance election-specific aspects, the probability of a parliamentary majority, pre-electoral coalition signals, and electoral volatility, increases the probability that a respondent predicts the correct government, whereas individual-level attributes do not have a significant or substantive influence on correct government prediction. Our findings have important implications for assumptions of strategic voting in multiparty settings and, more generally, for the literature on democratic accountability.

# Voting in multi-party systems: How do voters predict who will be in government?

Compared to two party systems, multi-party government presents challenges for voters, and models of voting. One line of research relates to the question of who should be held responsible for government policy (see e.g. Fisher & Hobolt 2010; Powell 2000). A related line of research concerns the question of whether voters have the capacity to cast a ballot for a preferred policy outcome, even if that means not voting for their most preferred party (e.g. Kedar 2005; Bargsted & Kedar 2009).

Voters may want to hold an outgoing political party to account by punishing them at the polls, but if they do not know whether or not that party is part of a likely future government the voter may end up voting for one of their likely coalition partners, thereby rewarding them indirectly (e.g. Fisher & Hobolt 2010). As Blais et al. note:

> "In order to vote rationally, the voter needs to determine what coalitions are possible, ascertain their probability and anticipate the policy compromises that will be made in each case" (Blais et al. 2006: 692).

Within this literature it is often anticipated that voters will be able to form accurate expectations about which government will form. For example, voters need to need to have a sense of likely government formation in order to vote strategically in coalition settings (Armstrong & Duch 2010; Bowler et al. 2010; Debus & Müller 2013, 2014; Lago 2008; Meffert & Gschwend 2010, 2011; Meffert et al. 2011). For a given expectation of which coalition is likely to form, voters may shift their votes in order to help that coalition win, or to move the median policy position of the coalition (Bargsted & Kedar 2009; Duch et al. 2010; Indridason 2011b; Meffert et al. 2011). In the Israeli election in 2003, for example, it was found that: "voters' views about the coalitions that could be formed after the election had an independent effect on vote choice, over and above their views about the parties, the leaders and their ideological orientations" (Blais et al. 2006; 691). So, some evidence suggests that

expectations inform voter behavior. But the evidence on expectations is often drawn from settings in which the context is fixed i.e. a single national election where there is a great deal of information and the coalition context is well known and well publicized. In such settings, most models of voter decision-making and strategic choice understandably emphasize individual level attributes, such as education, as factors which help voters form accurate expectations (e.g. Meffert et al. 2011; Irwin & Van Holsteyn 2012; Meffert & Gschwend 2010, 2011; Meffert et al. 2011).

A focus on individual level attributes necessarily downplays attributes of the context which will make it easier (or harder) for voters to make accurate predictions. It may be that the capacity of voters to develop expectations and vote strategically does not depend solely upon cognitive attributes of the voter herself but also depends upon the context in which the voter is located: some settings facilitate expectations more readily than others (see e.g. Lago 2008; Armstrong & Duch 2010; Fortunato et al. 2016; Debus & Müller 2014).

But if we are to emphasize the role of context, what kinds of contextual factors will make it easier or harder for voters – regardless of individual cognitive attributes – to make accurate predictions? We focus on two broad categories of the information environment in a given coalitional setting: the amount of information available to voters and the stability of the political situation. Voters need information in order to be able to form reasonable expectations, where information exists e.g. through polling and/or through such devices as pre-election coalition signals, voters will respond and, consequently, make more accurate predictions. But some coalition situations are more volatile than others: vote shares of parties may change during an election and, in consequence, will change coalition possibilities. In such volatile settings all voters will have a harder time forming accurate expectations. In brief, we would expect voters to do better predicting coalition outcomes in situations where information is plentiful and vote shares stable. Voters will do worse where information is sparse and vote shares are unstable. Our expectation is that these situations will make it easier (or harder) for

all voters to develop accurate expectations, which means that these kinds of situations will have bigger consequences for levels of accuracy than will individual voter attributes.

We can turn these broad expectations into more specific hypotheses that provide an account of the relationship between context – the coalition bargaining situation in front of voters – and the capacity of voters to make accurate predictions. Even with our emphasis on context, the natural starting point, as it is with most models of voter choice, lies in the properties of individual voters themselves. Individual level factors which shape expectations are also the most straightforward to develop since we would expect cognitive resources at the level of the individual to be key in helping voters form expectations. We know, from the careful work of scholars such as Meffert, Gschwend, Debus, Müller, and others, that individual levels of interest, knowledge, and education will be important in shaping expectations in straightforward ways: i.e. the more interested and knowledgeable the voter the more accurate the expectations (Meffert & Gschwend 2010, 2011; Meffert et al. 2011). Meffert et al. (2011) provide a good basis from which to begin since they develop a series of sensible hypotheses relating to expectation formation at the individual level. The insights provided by these individual level models will therefore form our baseline model of expectations. H0 is that accurate coalition expectations will be related to individual measures of cognition and information processing. We would expect, for example, factors such as a high level of interest in the election, high levels of education and age, the latter a measure of experience with the system, help voters form accurate expectations.

But, we argue, these individual level attributes are not always sufficient in helping voters form *accurate* expectations. Even highly educated, politically interested older voters will struggle in certain contexts. We argue that information about the coalition situation – the context in which the coalition is forming – allows voters to make better predictions. At election time, there is often some polling evidence or some examples of news coverage that will help shape voter expectations (Stoetzer & Orlowski 2020). In national elections, of course, this kind

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of information is plentiful but is much less plentiful in sub-national elections and so we can expect to see a wide variation in the amount of information available to voters from state to state. Nevertheless, when such information is available, we would expect voters to respond if they think a party has a high probability of gaining a majority of seats in the upcoming election; respondents should be more likely to predict this coalition.

> **H1 (Probability of a Majority/Public Support)**: Coalitions are seen as being more likely to form if the coalition option has a high probability of gaining a majority of seats, as revealed in pre-election polls.

But polling information is only part of the relevant informational context that will help shape which government will form. Often the government is formed only after extensive discussion between parties. As Golder notes: "As a result, the lines of accountability are blurred and it is unclear how well voter preferences are reflected in the government that is ultimately formed" (Golder 2005: 646). Pre-electoral coalition agreements represent a response to this situation by identifying government alternatives and allowing the electorate to register support for them and, as a result "electoral coalitions may increase democratic transparency and provide coalition governments with increased legitimacy and stronger policy mandates" (Golder 2006: 194). In part because of this usefulness, pre-election coalitions are quite common. Golder notes that in 292 elections 44 per cent had at least one pre-electoral coalition (Golder 2006: 194; see also Ibenskas 2016; Gschwend et al. 2017). Of course, for pre-electoral coalition agreements to work in this way, voters need to realize that these agreements are in place. The degree to which voters are aware, and act upon, pre-election agreements is thus important to those questions. If there are pre-election coalition agreements or coalition signals (Golder 2006; Gschwend et al. 2017) we would expect to see greater certainty among voters about that particular coalition forming – conditional on election results. Thus, if the media report more often about the likelihood of two or more parties forming a coalition post-election

or signaling the willingness to cooperate, we expect that voters react to this and incorporate pre-electoral coalition signals into their government predictions.

> **H2 (Pre-electoral Coalition Signals)**: Coalitions are seen as being more likely to form if media coverage signals cooperation between parties.

Other factors that affect the likelihood of a given coalition forming will relate to interactions between the parties within potential coalitions and the likelihood of being able to come to an agreement. Within the coalitions literature a standard expectation is that parties ideologically closer to each other will be more likely to form a coalition than ones which are ideologically distant (see e.g. Martin & Vanberg 2003; Debus 2009; Debus & Müller 2014; Indridason 2011a; Bowler et al. 2020). We expect voters in coalition systems to see things in a similar way:

> **H3 (Ideological Distance)**: Coalitions are seen as being more likely to form if the parties are ideologically close to each other.

Up until this point, our hypotheses have stressed the ways in which the information environment may assist or hinder voter attempts to form expectations. But there are also ways in which real-world voters do not always seamlessly update expectations. Along with Meffert et al. (2011), therefore, we would also expect those voters who have more intense party preferences to be more willing to engage in "wishful thinking" and be less open to the influence of polling and other sources of information. Consequently, wishful thinkers are less likely to form accurate expectations. A respondent who has one desired government might select this government as the predicted coalition. Yet, this coalition is less likely to form, as some of the "wishful thinkers" might not be rational in their prediction (Searles et al. 2018).

> **H4 (Wishful Thinking)**: A respondent's desired government has a higher probability of being identified as the predicted coalition.

Finally, political parties are the building blocks of coalitions and the party system provides the collection of building blocks from which coalitions are chosen. As Debus and Müller point out, in some circumstances, voters learn what coalitions may form because those coalitions have formed frequently in the past (Debus & Müller 2014). A party system that is changing will upset such learning. New party entrants, for example, will introduce new coalition possibilities and necessarily take votes away from existing parties. Changing party systems allow for less "coherent voter preferences and [less] predictable electoral alignments" (Tavits 2008: 549).

A straightforward expectation, thus, is that voters should have an easier time choosing who will be the government when the party system is stable than when it is changing and new parties are entering the legislature.

> **H5 (Volatility)**: Voters are more likely to make accurate predictions when the party system is stable and less likely to make accurate predictions when the party system is volatile.

Taking these hypotheses together they make the case that voters will have an easier time forming accurate expectations when information is plentiful (through polls or coalition signals) and party vote shares are relatively stable. The literature to date has emphasized individual level factors and so the default expectation will be that – in any comparison of effects between individual and contextual factors – it will be the former which will weigh more heavily. Yet, as we have argued, there are some contexts in which individuals may find it hard to develop expectations and contexts in which many will find it easier. We expect that the effects of context will be at least as consequential as individual level attributes.

# Data and measurement

*Data*

To date, most of the evidence which speaks to the question of voter expectations and strategic voting in coalition systems has emphasized the role of individual level attributes, in part because of limited variation in coalition negotiation situations. A national election, for example, will present the same case to all respondents. We therefore analyze 19 surveys conducted prior to Land elections between 2010 and 2017, as part of the German Longitudinal Election Study, to allow us to compare across coalition situations.[1] To compare how coalition predictions in lower information environments differ from information rich first-order elections, we contrast the findings with coalition predictions prior to the 2009, 2013, and 2017 German federal elections.

Table 1 provides an overview of the data used in this paper, displaying the number of respondents who made a coalition prediction, the number of polls used for simulating election results, and the number of coalition options to be evaluated, in terms of their likelihood of becoming the government after the election. The federal pre-election studies consist of around 2,000 respondents, each of whom completed a computer-assisted personal interview. For the subnational elections we have between 429 and 579 respondents who predicted a government.

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[1] The GLES administered pre-election studies prior to all Land elections since 2011, with the exception of Bremen and Hamburg in 2011 and 2015. The GLES surveys and alternative surveys for these states (see e.g. Bowler et al. 2018) were conducted after election day. We also had to exclude the election in Saxony-Anhalt (2016) because the coalition to be formed (CDU, SPD, Greens) was not part of the choice set in the survey. Therefore, respondents had no chance to predict the correct coalition.

*Table 1: Elections included in the analysis*

| Year | Election | Respondents | Missing prediction | Missing prediction (%) | Government options | Polls |
|------|----------|-------------|--------------------|------------------------|--------------------|-------|
| 2009 | Federal Election | 2173 | 508 | 23.4% | 8 | 52 |
| 2010 | North Rhine-Westphalia | 572 | 34 | 5.9% | 10 | 18 |
| 2011 | Baden-Württemberg | 562 | 44 | 7.8% | 10 | 20 |
| 2011 | Berlin | 615 | 30 | 4.9% | 10 | 24 |
| 2011 | Mecklenburg-Western Pomerania | 562 | 38 | 6.8% | 10 | 8 |
| 2011 | Rhineland-Palatinate | 565 | 34 | 6% | 10 | 14 |
| 2011 | Saxony-Anhalt | 580 | 41 | 7.1% | 10 | 3 |
| 2012 | North Rhine-Westphalia | 506 | 47 | 9.3% | 5 | 19 |
| 2012 | Schleswig-Holstein | 661 | 82 | 12.4% | 5 | 9 |
| 2013 | Bavaria | 532 | 15 | 2.8% | 10 | 12 |
| 2013 | Federal Election | 2003 | 111 | 5.5% | 6 | 51 |
| 2013 | Hesse | 529 | 24 | 4.5% | 7 | 6 |
| 2013 | Lower Saxony | 543 | 94 | 17.3% | 5 | 14 |
| 2014 | Brandenburg | 507 | 10 | 2% | 8 | 6 |
| 2014 | Saxony | 503 | 12 | 2.4% | 10 | 10 |
| 2014 | Thüringen | 504 | 11 | 2.2% | 8 | 2 |
| 2016 | Baden-Württemberg | 512 | 9 | 1.8% | 8 | 15 |
| 2016 | Mecklenburg-Western Pomerania | 500 | 4 | 0.8% | 9 | 6 |
| 2016 | Rhineland-Palatinate | 512 | 15 | 2.9% | 8 | 12 |
| 2017 | Federal Election | 2179 | 261 | 12% | 8 | 51 |
| 2017 | North Rhine-Westphalia | 521 | 4 | 0.8% | 8 | 14 |
| 2017 | Schleswig-Holstein | 512 | 8 | 1.6% | 8 | 5 |

***Note***: *"Respondents" refer to the total number of respondents per election study, "Don't know/No answer" lists the number of respondents who did not make a government prediction, "No prediction (%)" calculates the percentage of respondents without a valid coalition prediction, "Government options" counts the maximum number of governments to be evaluated by respondents (i.e. the "choice set' for the conditional logistic regressions), and "Polls" lists the number of opinion polls used to simulate seat shares and the effective number of parties.*

### *Dependent variable*

Our dependent variable is *Predicted Government.* Across all elections only one single-party government (CSU in Bavaria 2013) was formed. Therefore, we use the terms coalitions and governments interchangeably, although single-party governments are theoretically possible.

The question wording of the items about predicted governments varies across surveys. Three state election surveys and the 2017 federal election study employ an open format ("Which party or parties will form the government?"), four surveys use a closed format that

lists potential governments and voters can select one or more of these as their predicted government.[2] The remaining election studies use a continuous item instrument that asks respondents to estimate the probability (rescaled from 0 to 10) that each of the coalition possibilities will be in government after the election. Importantly, for the second and third question format, respondents may have multiple predicted governments and we allow for this in the main models. If a respondent ranks the probability for one particular coalition is higher than all other potential governments, this respondent has expressed one preferred government. Another potential issue with the continuous coalition format relates to the observation that many respondents assigned the same probability of governing after an election to two or more coalitions. We take these differences into considerations by using three specifications of the dependent variable (1: selecting only respondents with one predicted coalition; 2: for respondents with more than one prediction, randomly sampling one of the options; 3: including respondents with more than one prediction multiple times in the regression models). As we show in Figure 2 below, the predictions, understandably, become less accurate when we allow for more than one prediction. We use the binary measure *Correct Prediction* to test the accuracy of coalition predictions. The variable indicates whether or not a respondent's predicted government was formed after the election.

***Independent variables***

*Coalition Signals in Newspapers*: Turning to the measurement of the four key independent variables, one of the main factors of interest is the way in which parties may signal their intentions to each other and, hence, to voters. *Coalition Signals in Newspapers* is a variable that counts the number of times each coalition option has been mentioned in German print and

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[2] Unfortunately, these four surveys do not contain items on the desired government. While we can calculate the correct predictions, we cannot test "wishful thinking" effects for these four election. Yet, the *Ideological Distance Government and Respondent* variable – an alternative measure for a desired government – can be constructed for all 22 elections and leads to the same conclusions as the *Desired Government* dummy.

online newspapers in the two years prior to an election. We use the time-window of two years prior an election for two reasons. First, parties indicate cooperation throughout the entire legislative cycle, not only immediately prior to elections. Moreover, longer time-spans allow for mentions in newspapers, especially for smaller German states that do not receive much coverage. This should result in more precise estimates. We use all German online and print newspaper articles available on LexisNexis, resulting in a text corpus of over 15,980 articles that mention at least two parties and a term indicating a coalition or cooperation. Each newspaper article is classified either as news about the federal level or one of the 16 states using the semi-supervised geographical news classifier *Newsmap* (Watanabe 2018) in combination with the *quanteda* R package (Benoit et al. 2018). We apply dictionaries to all 760,0000 sentences and check whether the sentence indicates the willingness of two parties to govern together or co-operate. In over 19,800 sentences the dictionary-based approach detected at least two parties or the name of a coalition and a word indicating cooperation. A higher aggregated value implies that the media portrayed this party combination as potential coalition partners. To make the measure comparable across elections, we rescale the variable to a 0–100 scale for each election. A value of 0 means that potential coalition partners have not been mentioned at all in the two years prior to an election; a value of 100 implies that all mentions were devoted to the same government option. The classification process is described extensively in the SI Section B.

Validation is crucial when conducting quantitative text analysis. In order to test whether the measure derived from the quantitative analysis of texts provides meaningful estimates of coalition signals, we compare our measure to an existing classification of pre-electoral coalitions. Best (2015) hand-coded the signals for all coalitions in German state elections between 1990 and 2012. 58 election-coalition options are part of our survey data and also included in Best (2015). We match the human classification with our continuous measure and run a linear regression with our *Coalition Signals in Newspapers* as the dependent variable.

The manually coded classes (negative signal, neutral, alternative pre-electoral coalition, desired pre-electoral coalition) serve as the independent variables.

*Table 2: Validating the text-based measure of Coalition Signals in Newspapers*

|  | **Model 1** |
| --- | --- |
| Coalition signal: Negative coalition signal | 6.03 (3.63) |
| Coalition signal: Neutral coalition signal | 7.34 (3.14)[*] |
| Coalition signal: Alternative pre-electoral coalition | 16.49 (5.74)[**] |
| Coalition signal: Desired pre-electoral coalition | 21.77 (3.41)[***] |
| $R^2$ | 0.51 |
| Adj. $R^2$ | 0.48 |
| Num. obs. | 58 |

[***]$p < 0.001$; [**]$p < 0.01$; [*]$p < 0.05$

The regression in Table 2 shows that *Negative* coalition signals have the lowest value, followed by *Neutral* and *Alternative* coalitions. *Desired pre-electoral coalitions*, as coded by Best, have by far the largest explanatory effect, indicating that our newspaper-based measure of positive coalition signals is a good proxy. The order of coalitions, as well as the significant differences, exactly mirror our prior expectations. Moreover, even though the sample consists of only 58 coalition options, the dependent variable's variance explained through the manually coded coalitions ($R^2$) amounts to 0.51. This good model fit and the close correspondence of the automated coding and the qualitative human assessment of the same coalitions gives us confidence in the validity of our novel measure of coalition signals. Admittedly, this measure merely serves as a proxy for pre-electoral coalition signals instead of providing a classification of coalition signals. However, our approach points to the usefulness and potential of classifying coalition signals from political text or newspapers.

*Probability of a Majority*: A second factor of interest to our argument is the way in which voters may respond to polling information. Here our focus on sub-national politics provides an advantage because of the considerable variation in the availability of polling

information across states. The measure *Probability of a Majority* is based on the aggregation of pre-election polls published for the respective Land election, using the simulation method recently introduced by Bender and Bauer (2018). We use 184 state election polls conducted in the year prior to the start date of each survey, and 154 polls published in the last six months prior to the federal elections. On average, we have around 10 opinion polls per state election and 50 per federal election.[3] Using the party level survey results we pool all the relevant surveys and apply the algorithm by Bender & Bauer (2018) to estimates of seat shares for each party.[4] These seat shares are then used to calculate the Bayesian posterior probabilities that a given coalition obtains a majority of seats. For more detailed information on the simulations, see the Appendix.[5] This approach allows us to have an estimate of how election polls signal the probability that a coalition will be formed based on the information that voters have prior to casting their ballot. We view these probabilities as important information that will affect voters' predictions.

*Perceived Distance Between Parties*: We measure the ideological composition of a potential government as the absolute *Perceived Distance Between Parties* between the two most extreme coalition parties, calculated separately for each election and respondent. For single-party government options, we assign a value of 0, as there is no ideological distance between parties (assuming that parties are unified actors). If a respondent does not evaluate the left-right positions of one of the parties or coalitions, we use the average ideological distance based on all respondents in the respective election that evaluated the coalition option. In SI

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[3] We scraped all available Land election polls from https://wahlrecht.de, a website that collects all election polls published by major German polling institutes.

[4] Parties that do not receive more than five per cent of the votes in the aggregated simulated elections are excluded from the seat distributions. This step is necessary because of the five percent threshold that exists in all state parliaments and the Bundestag.

[5] The probability for each coalition equals the percentage of the simulations a coalition would obtain sufficient seats for a majority. Probabilities (depending on which parties are estimated to be represented in parliament) for the following governments were predicted: (1) CDU/CSU; (2) CDU, SPD; (3) CDU, FDP; (4) CDU, Greens; (5) CDU, FDP, Greens; (6) SPD; (7) SPD, Greens; (8) SPD, FDP, Greens; (9) SPD, Left; (10); (11) SPD, FDP; (12) SPD, Left, Greens; (13): CSU, Free Voters; (14) SPD, Greens, Free Voters; (15) CDU, AfD.

Section I, as a robustness check, we also test an alternate measure of this variable, based on Wordscores positions (Bräuninger et al. 2020). The results remain unchanged.

*Desired Government*: Our final key independent variable, *Desired Government* captures "wishful thinking". This is a measure which helps to assess how resistant voters are to the kinds of information we have discussed so far. The hypotheses we have advanced so far emphasize the way in which voters may be able to update expectations. But some voters may not be open to updating and instead see what they wish to see. Hence the inclusion of a wishful thinking measure. If the predicted government equals the desired government, we assign a value of 1, and 0 for the coalitions that are not desired. As an alternative measure we calculate the absolute difference between the left-right position of a coalition, measured through the average placement of the parties on a left-right scale (aggregated across all respondents in a survey) and the respondent's left-right self-placement (*Ideological Distance Government and Respondent*). If the "wishful thinking" effect holds, a respondent should be more likely to predict a government that is proximate to her own left-right position.

*Incumbent Government* is included as a contextual control variable and indicates whether a coalition option is the incumbent government at the time when the survey was conducted. This variable also captures, in part, voters' proclivity to learn from coalition patterns (Debus & Müller 2014) and predict outcomes based on the information that is most accessible to them (Zaller 1992).

## Modelling strategy

We employ a conditional logit regression approach to model coalition selection opportunities (McFadden 1974). Conditional logit models have been used widely in predicting government formation or coalition expectations (e.g. Martin & Stevenson 2001, 2010; Gross & Debus 2018). Each government mentioned by at least one respondent in an election is part of a "choice

set' which comprises the government to be formed after the election. The government(s) predicted by a respondent receive(s) a score of 1, while a value of 0 is assigned to all other coalition options. The conditional logit approach allows us to take into considerations differences between the choice set on the level of respondents and government options. Note that the choice set varies for each election. For instance, some surveys did not ask whether a particular single-party government or an unusual three-party government would be formed. The choice set for the elections ranges from 5 to 10 government options depending on the pre-election survey.

For the analysis of correct predictions and missing predictions, we run multilevel logistic regressions with random effects for each election and the type of question about the coalition prediction. Moreover, we run random forest algorithms (Breiman 2001; Liaw & Wiener 2002) to assess the importance of the information environment and individual-level attributes for the correct prediction of the coalition.

# Results

We divide the results section into three parts. First, we provide descriptive evidence about variation in coalition predictions in the German states and on the federal level and list the most frequently predicted coalitions for each election. Second, we estimate which of the factors, that vary across the choice set, is more likely to make a respondent predict that a particular government will be formed. Third, we analyze which voters are more likely to predict the government formed after an election, and compare individual-level characteristics to contextual factors of the election.

### How often do voters get it right? Descriptive evidence

First, we investigate how often voters predict the correct government. Figure 1 displays the accuracy of coalition expectations across the surveys in our sample i.e. the proportion of respondents whose predicted government also was the government formed after the election. As can be seen, there is wide variation in voter accuracy across the states, with almost 80 per cent of respondents correctly predicting the outcome in Mecklenburg-Western Pomerania in 2016 but only 3 per cent forecasting the Brandenburg government of 2014 accurately. Average responses across the states, even within the same state, vary substantially. At the very least, this implies that a purely individual level model i.e. one that models expectations only as a function of voter attributes (knowledge, motivation, and so on) is likely incomplete. A related point is that, for the most part, accuracy seems quite low – the samples have figures that are typically below 30 per cent.

*Figure 1: Percentage of correct coalition predictions in each election. The horizontal bars show 95 per cent bootstrapped confidence intervals based on 1,000 resamples with replacement.*
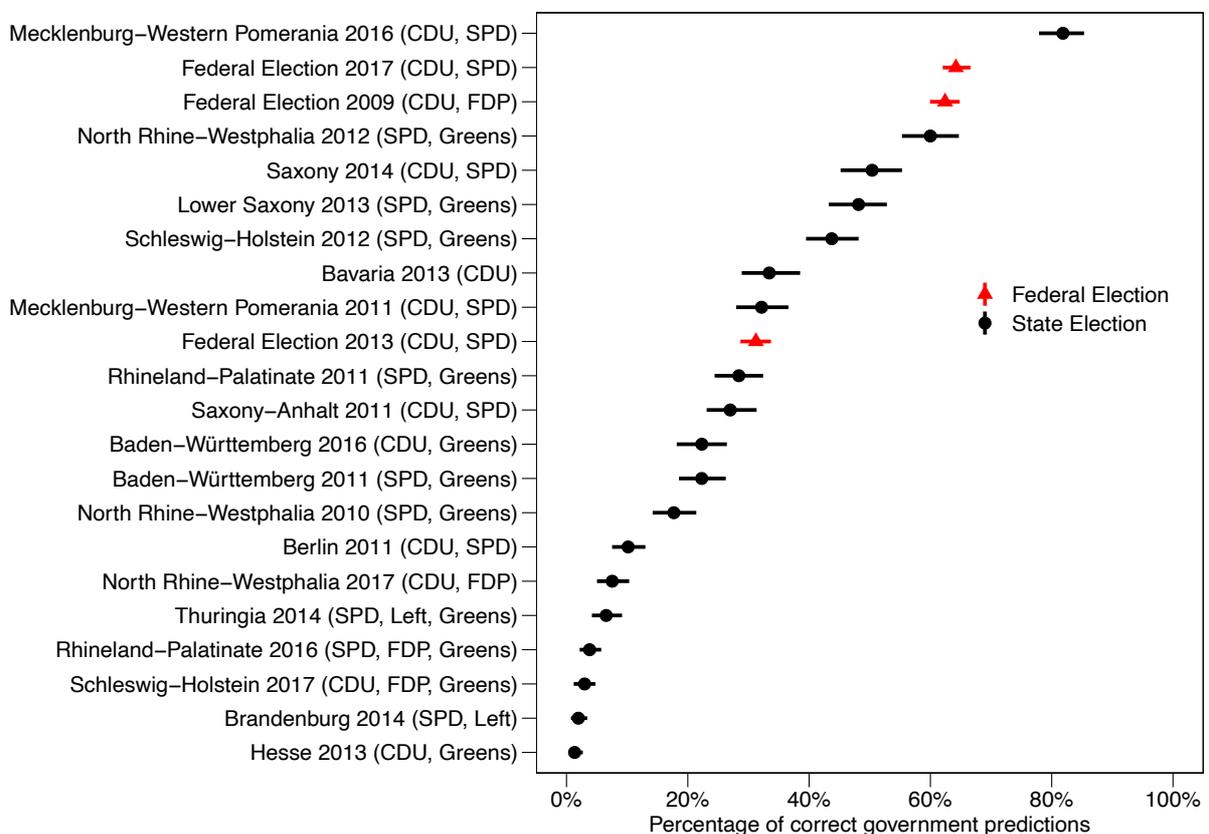
Figure 2 displays the percentage of correct predictions, pooled for all state and federal elections. If more than one government prediction is permitted, the percentage of correct predictions lies at 17 per cent, and rises up to 28 per cent if we only consider respondents who made a single prediction. For the federal elections, we observe much higher proportions of correct predictions across all three measurements, ranging between 38 and 50 per cent. These high figures are driven by the elections in 2009 and 2017, in which more than six out of ten survey respondents predicted the correct coalition.

*Figure 2: Percentage of correct coalition predictions, pooled across all Land elections. The horizontal bars show 95 per cent bootstrapped confidence intervals based on 1,000 resamples with replacement.*
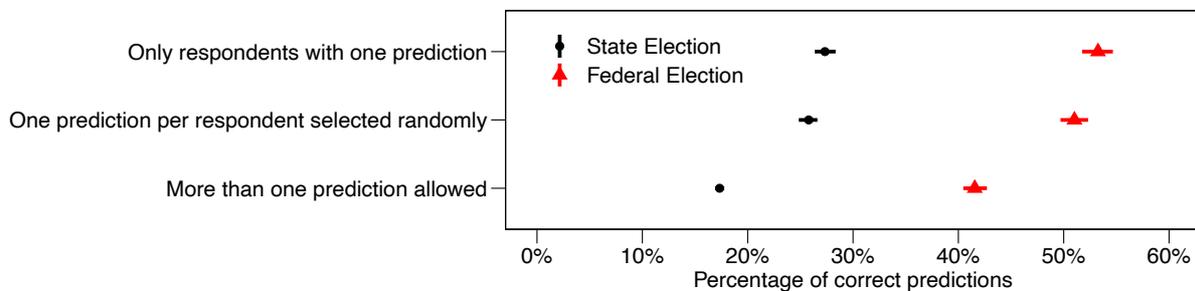


Figure 3 plots the three most frequent government predictions for each of the elections. In 36 per cent of the elections (8 out of 22) the most frequently predicted coalition was also formed after the election. In 5 out of 22 elections (22 per cent), the governments formed after the election was not part of the three most frequently predicted governments. In the federal elections of 2009 and 2017, the winning coalition was by far the most frequently predicted one, with differences of over 40 percentage points compared to the second most frequently predicted coalition. Overall, the descriptive statistics highlight that respondents' predictive ability is much lower for state, than for general elections. Moreover, we observe considerable differences across elections.[6]

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[6] In SI Section C of we examine whether there are question wording effects.

*Figure 3: Proportions of the most frequently predicted governments for each election. Red triangles indicate the government formed after the election.*
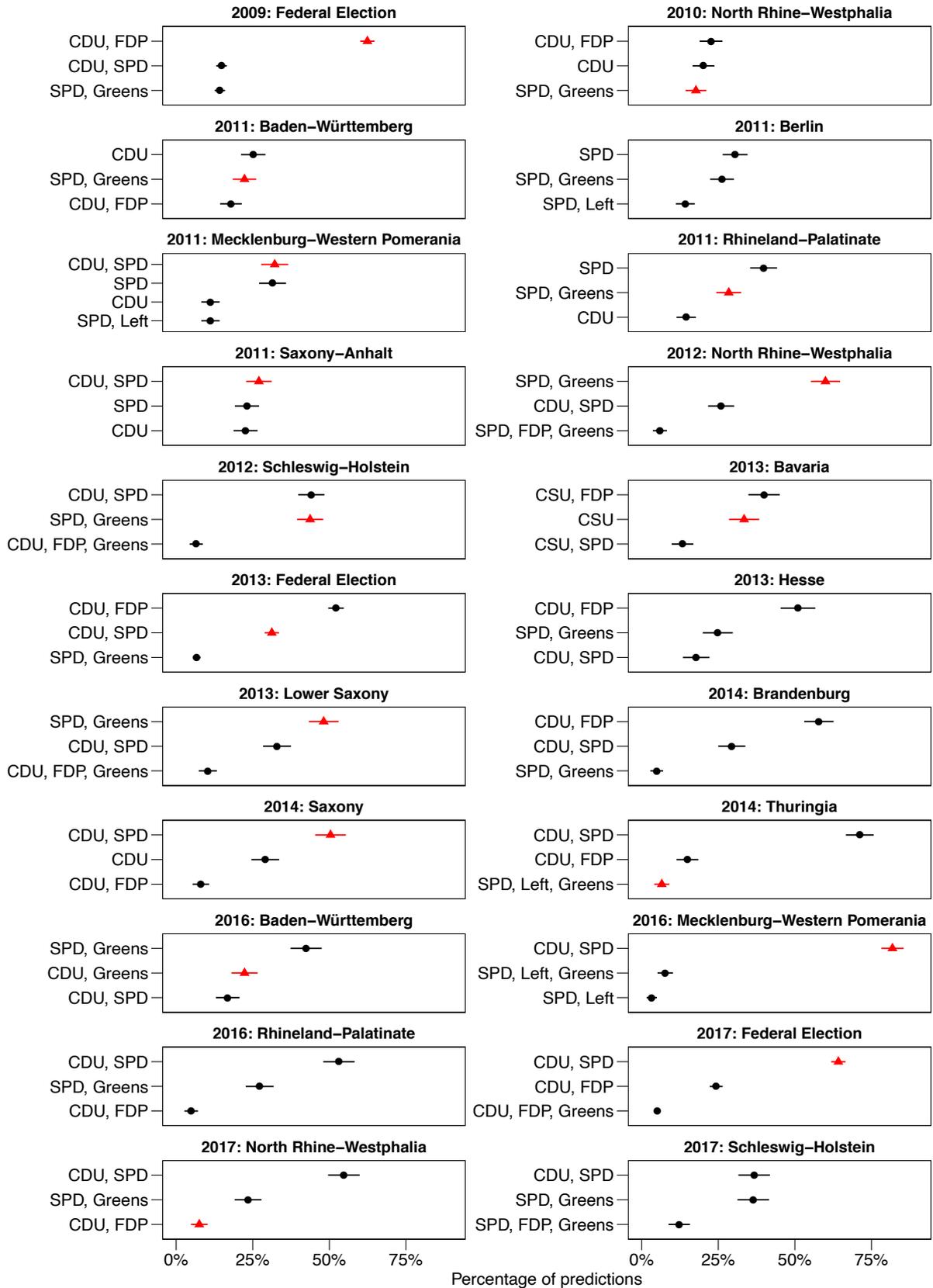
### *What drives coalition predictions?*

Next, we analyze which coalition of the choice set is more likely to be predicted as the government, using conditional logistic regressions. A positive (negative) coefficient indicates that a higher value of one dependent variable correlates with a higher (lower) chance of this option being selected by a respondent.[7] First, we report results for all election surveys that contain the *Desired Government* variable. Figure 4 plots the coefficients and 95 per cent confidence intervals.[8]

*Figure 4: Predicting which government option is selected as the predicted government from the choice set of all governments. The coefficients are derived from 18 models, one for each election in the sample that includes information on the desired government.*
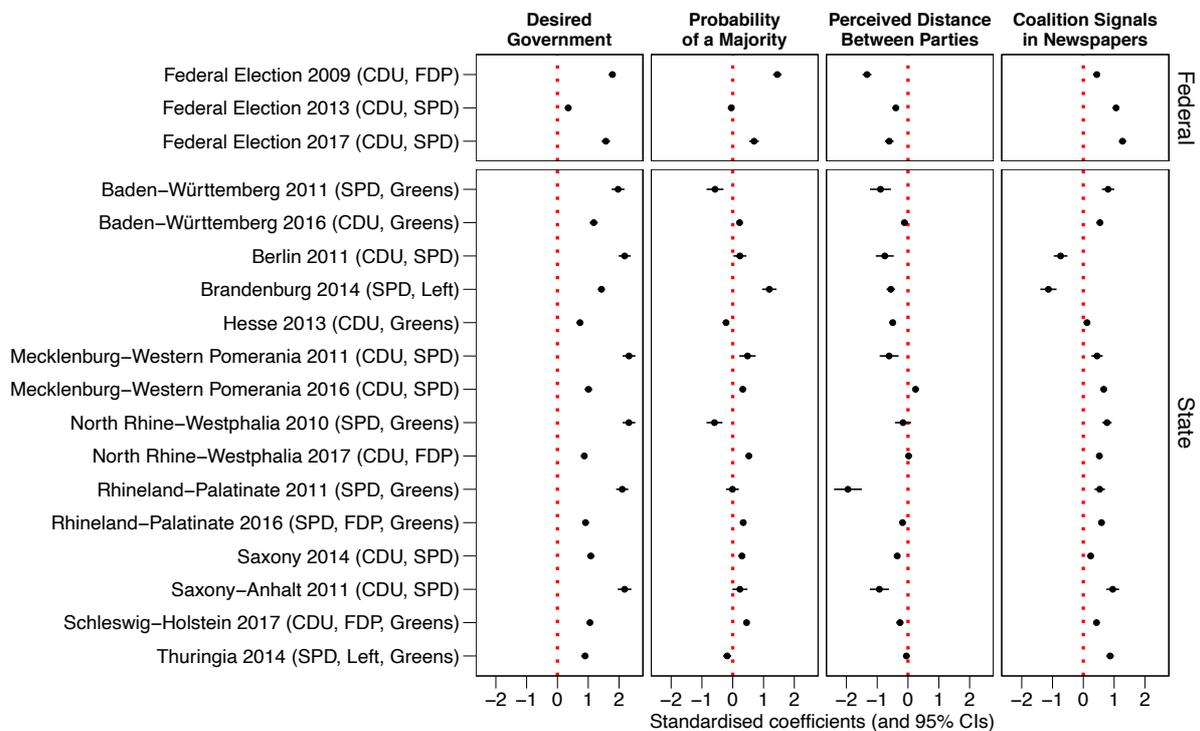


**Note**: *If a confidence interval does not cross the dotted vertical lines at 0, the coefficient is statistically significant at the 95 per cent level.*

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[7] We standardise continuous variables by subtracting their means (at the relevant election) and dividing by two times their standard deviations (at the relevant election). This procedure makes it easier to compare the effects with the binary variables (Gelman, 2008).

[8] In these models we exclude *Incumbent Government* due to multicollinearity issues with *Coalition Signals in Newspapers.* Incumbent coalitions are naturally mentioned more often in news outlets than other possible governments.

The *Desired Government* variable (left-hand panel of Figure 4) is positive and statistically significant across *all* federal and state elections. The coefficients in the left-hand panel reveal that federal elections do not seem to have higher levels of wishful thinking than state elections. The main results stay the same when we use the measure of the ideological distance between the respondent and the respondents' ranking of the predicted government options as a measure of wishful thinking (Figure A 5). Using this variable, instead of the dummy measure of wishful thinking (*Desired Government*), increases the number of elections from 18 to 22.[9] A larger distance between the respondent and the government option has the expected negative (and statistically significant) coefficient in 20 out of 22 elections, offering further support for wishful thinking dynamics in coalition formation expectations. This is a pattern consistent with the findings of earlier studies that focused on the individual level drivers of voter predictions.

Turning to the *Probability of Majority* (second panel), 10 out of 18 elections show the expected positive coefficients. In those elections, respondents were more likely to predict a government with a higher probability of having a majority of seats. Looking at our measure of the perceived *Ideological Distance Between the Parties*, we observe a negative and significant effect in all but two elections (third panel). Respondents usually do not predict a government consisting of parties they perceive as ideologically distant. Finally, *Coalition Signals in Newspapers* (right-hand panel) variable has the expected positive coefficient in all but two elections. Given that the measure of coalition signals, derived from the automated analysis of newspaper coverage, contains some noise, the significant coefficients across almost all elections can be seen as conservative estimates of the impact of pre-electoral coalition signals

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[9] The following election studies do not contain the *Desired Government* variable but include the items necessary to construct the absolute distance between respondent's left-right position and the average left-right position of the government option: Bavaria 2013; North Rhine-Westphalia 2012; Schleswig-Holstein 2012; Lower Saxony 2013. Only in Bavaria in 2013 (only single-party government) does the coefficient fail to reach statistical significance.

on coalition prediction. Overall, these results offer strong support that wishful thinking, a rational assessment of arithmetically realistic coalitions, parties' coalition signals in the media, as well as perceived ideological distances exert an influence on coalition predictions.

The result that the probability of achieving a majority has a negative coefficient in four of the 18 elections is slightly puzzling and may point to the existence of an interaction between chance and willingness to form a coalition. That is, some of the government combinations might have a mathematical majority of seats but are very unlikely to form.[10] To explore this possibility we created a measure of the willingness to form a coalition. We count the occurrences of coalitions following all 106 land elections between 1990 and 2017 (see SI Section I). Coalitions that have been formed after at least five elections are coded as "common" options that demonstrate that parties are willing to form a joint government on the state level. Six of our government options are coded as commonly occurring coalitions. We interact this measure with the standardised measure of probability of majority and report the coefficients for all models in Figure A 7. Unsurprisingly, previously formed coalitions on the state level are more likely to be predicted by respondents. The interaction between common coalitions and the probability of having a majority has a statistically significant negative coefficient in just one election (Saxony-Anhalt 2011), suggesting that respondents are indeed more likely to predict coalitions that have a high probability of obtaining a majority of seats *and* have been formed in the past.[11]


*Individual and context-specific explanations for accurate predictions*

Meffert et al.'s (2011) study shows that various individual-level variables influence the accuracy of electoral expectations. Our harmonized dataset of election studies enables us to go

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[10] We thank one of our anonymous reviewers for raising this point.
[11] In SI Section F and G, we report and interpret the coefficients for aggregated models for all federal and state elections. The direction of coefficients corresponds to the evidence from the election-specific analyses.

beyond individual-level factors and include election-specific variables which capture the informational context facing voters. We run logistic regressions with a binary dependent variable that takes the value 1 (0) if the predicted coalition equals (does not equal) the coalition formed after an election. As noted above in our discussion of $H_0$, we include standard *Interest in the Election* (as a continuous variable ranging from 0 to 4), *Education* (a binary variable coded 1 for Abitur or higher), *Age* (6 category variable), *Gender* and *Income* (a continuous variable ranging from 0 to 10). The contextual variables are the *Wishful thinking* dummy, the *Probability of a Majority* for the predicted coalition, whether the selected option was the *Incumbent* government, and the *Type of Election* (federal vs. state election). We also add *Pedersen's Volatility Index* (Pedersen 1979), measured using the aggregated opinion polls, to capture volatility and uncertainty prior to an election (H5 above). Higher values imply more vote switching between parties, which should decrease the accuracy of predictions. In the main analysis, we only focus on respondents who made exactly one prediction but our results remain similar when we also include the respondents who made more than one prediction although the overall accuracy of predictions decreases, suggesting that respondents who make more than one prediction might be either guessing or answering the survey item randomly.

Model 1 of Table 3 presents a baseline model that only includes measures of the individual-level characteristics of respondents. Wishful thinking (*Desired Government*) has the expected negative coefficient: respondents who select their preferred government as the coalition that will form are less likely to predict the correct coalition. We also observe that respondents with lower levels of education (i.e. *no A-Levels (Abitur)*) are less likely to make a correct prediction, and that male respondents are somewhat more likely to predict the correct coalition outcome. The coefficients for the remaining variables are small and insignificant.

Only considering contextual factors (Model 2) results in more substantive findings with better explanatory power. In general, we find that predictive accuracy in a *State Election* is

substantively and significantly lower than in federal elections.[12] When a coalition option is selected that has a larger *Probability of a Majority* of seats (as forecast in opinion polls), the prediction is, not surprisingly, much more likely to be correct. On the other hand, when *Incumbent* coalitions are chosen, we observe a negative coefficient. Importantly, the goodness of fit statistics of the contextual model outperform the individual-level regression model. Combining the individual and contextual variables (Model 3) does not change most coefficients for the contextual variables, but *Desired Government* changes to a positive coefficient once we include *Probability of Majority* in the regression model. Models 3 and 4 remove the random effects for each election, but add the election-specific measure of volatility (*Pedersen's Volatility Index*) instead, which has the expected negative coefficient: the more uncertainty and volatility before an election – estimated through the expected changes in vote shares between parties – the less likely a respondent predicts the correct coalition.[13] Model 4 repeats Model 3 but also includes respondents who predicted more than one government. While it increases the number of observations, the substantive conclusions remain unchanged.

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[12] A pattern that is consistent with an explanation in which state elections are seen as "second-order" (Reif and Schmidt, 1980).

[13] In Section E of the appendix we assess the drivers of "Don't know" responses.

*Table 3: Predicting correct government formation*

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Desired Government | -0.12* | | 0.32*** | 0.20*** |
| | (0.05) | | (0.06) | (0.04) |
| Interest in the Election: Not much (ref.: No interest at all) | 0.08 | | 0.02 | 0.01 |
| | (0.11) | | (0.14) | (0.06) |
| Interest in the Election: Medium | 0.03 | | 0.05 | 0.02 |
| | (0.10) | | (0.13) | (0.06) |
| Interest in the Election: Strong | 0.04 | | 0.06 | 0.12 |
| | (0.11) | | (0.13) | (0.07) |
| Interest in the Election: Very strong | 0.14 | | -0.00 | 0.09 |
| | (0.12) | | (0.15) | (0.08) |
| Education: No A-Levels | -0.20*** | | 0.12 | 0.06 |
| | (0.06) | | (0.07) | (0.05) |
| Gender: Female | -0.11* | | -0.10 | -0.01 |
| | (0.05) | | (0.06) | (0.04) |
| Age: 26-35 (ref.: 18-25) | -0.32** | | -0.27* | -0.04 |
| | (0.10) | | (0.12) | (0.07) |
| Age: 36-45 | -0.20 | | -0.12 | -0.04 |
| | (0.10) | | (0.12) | (0.07) |
| Age: 46-55 | -0.16 | | -0.16 | -0.04 |
| | (0.10) | | (0.12) | (0.07) |
| Age: 56-65 | -0.14 | | -0.14 | 0.02 |
| | (0.10) | | (0.12) | (0.08) |
| Age: 66 and older | -0.14 | | -0.17 | -0.10 |
| | (0.10) | | (0.13) | (0.08) |
| Income Government | 0.01 | | -0.03 | -0.01 |
| | (0.02) | | (0.03) | (0.02) |
| Prediction Question: Coalitions - Continuous (ref.: Coa. - Binary) | -2.53 | -0.17 | | |
| | (1.52) | (2.14) | | |
| Prediction Question: Government Parties - Binary | -1.50 | 1.72 | | |
| | (1.54) | (2.12) | | |
| Probability of a Majority | | 5.21*** | 4.79*** | 2.80*** |
| | | (0.12) | (0.12) | (0.05) |
| Incumbent Government | | -0.34*** | -0.39*** | 0.30*** |
| | | (0.08) | (0.08) | (0.05) |
| State Election | | -2.23 | -1.81*** | -1.08*** |
| | | (1.20) | (0.09) | (0.05) |
| Pedersen's Volatility Index | | | -0.16*** | -0.04*** |
| | | | (0.01) | (0.01) |
| Number of Predicted Coalitions by Respondent | | | | -0.04*** |
| | | | | (0.01) |
| AIC | 9334.17 | 6319.00 | 6625.91 | 18941.56 |
| BIC | 9455.09 | 6369.72 | 6761.05 | 19103.31 |
| Log likelihood | -4650.08 | -3152.50 | -3293.95 | -9450.78 |
| Num obs. | 9073 | 10352 | 9073 | 24041 |
| Num groups: Election | 18 | 18 | | |
| Num groups: Coalition Prediction Question | | | 3 | 3 |

***p < 0.001; **p < 0.01; *p < 0.05

The last question relates to the relative importance of information context and respondent-level characteristics. The model fit statistics in Table 3 suggest that individual-level variables do not add much explanatory power. The AIC and BIC values are much lower in

Model 2 than in Model 1. This suggests that contextual factors and variables relating to the government options have more explanatory power when it comes to correctly predicting coalition outcomes. In addition, we measure the relative importance of the explanatory variables using a random forest. Random forest algorithms estimate hundreds of classification trees to identify the variables that help to correctly predict a binary outcome (for a recent application to vote choice see Elkink et al. 2020). Our outcome of interest is whether or not a respondent predicted the coalition formed after the election. We run 1,000 decision trees and estimate the mean decrease in accuracy for each independent variable. Higher values imply that leaving out a variable reduces the predictive accuracy and thus suggests a higher importance.

Figure 5 reports the results from the random forest model. Model 1 uses the "Desired coalition" dummy as an indicator of wishful thinking. In Model 2 we use the left-right distance between a respondent and the selected government as an alternative measure of "wishful thinking". We only include respondents who made a single coalition prediction. The results highlight that the *Probability of a Majority* and whether a coalition was the *Incumbent Government* are the two most important variables for correct predictions. The election ID, party system volatility, and the election type (federal vs. state election) also increase the mean accuracy across the decision trees. The left-right distance between the respondent and the coalition in Model 2 has a higher importance than the "wishful thinking" dummy in Model 1. Importantly, the individual-level variables do not contribute much to the predictive accuracy. *Age*, *Income*, *Interest in the Campaign*, the variables measuring *Wishful Thinking*, *Gender*, and *Education* are usually the least important variables in the random forest algorithms. The regression results and the random forest classification both highlight that the information environment (contextual and coalition-specific variables) is a much better predictor than attributes of the respondents.

*Figure 5: Relative variable importance in random forest models*
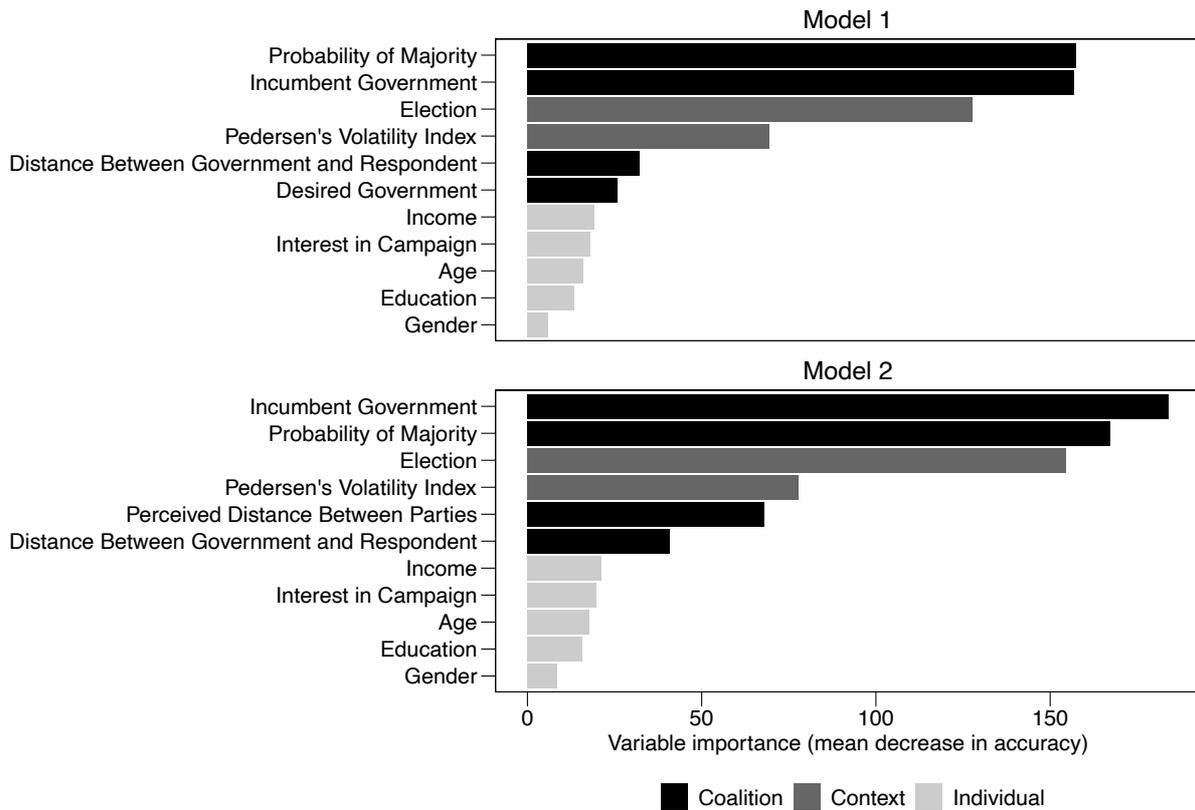


## Discussion

A voter's ability to look to the future and choose between alternative possible governments is fundamental to our conception of representative democracy and responsible government. But the choice between alternatives is not always clear cut, especially in multi-party systems ,where an ability to forecast election outcomes accurately is also relevant to models of voter choice. Patterns of political participation are shaped, amongst other things, by voters' expectations. Who a voter casts a ballot for, or to which party the voter chooses to donate money or for which party a voter decides to volunteer for at election time can be swayed by who the voter thinks will win power. Significant numbers of voters are strategic (Downs 1957; Cox 1997) and an ability to accurately predict election outcomes is key to their vote choice.

Searles et al. (2018) make an even broader point when they note that "false electoral predictions can undermine the perceived legitimacy of institutions and officials by affecting

whether electoral losers perceive their defeat as legitimate" (Searles et al. 2018: 889), with all that implies for someone's willingness to support opposition tactics within the legislature. Within the context of multi-party politics and coalition formation it is likely that voters are accustomed to a complicated relationship between election results and government formation. Nevertheless, if the government which results from an election ends up being unanticipated it is straightforward to expect that voters can question the system of how governments are formed. There are, then, broad consequences both for individual political action and, potentially also for governmental legitimacy, within voter expectations.

In terms of our results, we find that the predictability of alternative future governments varies significantly across multi-party systems. For example, arithmetically impossible coalitions or coalitions of ideologically distant parties are much less likely to be chosen as the predicted government. As previous work has shown, individual level attributes (e.g. education) are consequential, even though the strength of the relationship often depends on the modeling choice and selection of control variables. Second, we show the main drivers of the accuracy of voter predictions are related to the information context in which voters are embedded rather than individual level attributes themselves. There are simply some settings in which voters find it easier to form expectations than others and we can characterize these settings in terms of information availability and stability of the information environment. For example, the availability of opinion poll information has an effect as voters take parties' standing in the polls into consideration when predicting the government. Similarly, pre-election coalition discussions (more specifically media coverage of those discussions) are also seen to influence voter expectations.

This last point is consistent with a broad view of a "rational public' i.e. one that uses information in reasonable ways to draw reasonable conclusions about a political situation and act accordingly. This, in itself, is encouraging news for models which consider strategic voting in coalition contexts. On the other hand, the degree of error in voter predictions is such as to

cast doubt on the extent to which voters are able to accurately predict which government they are voting *for*. After all, we do also find considerable error in voter predictions. There is, for example, strong and robust evidence of "wishful thinking" when predicting which government will form and this is consistent, as we noted, with previous work. Voters are clear about which party they are voting for, and it may be still clear which parties and government they are voting against, but the evidence here shows that voters find it easier to know what they are voting for under some circumstances rather than others. That point is not so much a contribution to the literature on voter incompetence – after all, our main hypotheses speak to how voters respond to information – so much as a recognition that, sometimes, politics is hard to predict.

This paper examined sub-national elections in a highly consolidated, prosperous democracy, one with a traditionally stable party system (the recent rise of the AfD aside). But even here, we find that highly educated and interested voters, often find it difficult to forecast election outcomes. Extending the results to other national contexts may reveal the depth of this challenge in less auspicious settings. Overall, the paper underscores the importance of high quality information (e.g. opinion polls, extensive newspaper coverage) in the democratic process.

# References

Aldrich, J.H., Blais, A. & Stephenson, L.B. (2018). *The many faces of strategic voting: Tactical behavior in electoral systems around the world*. Ann Arbor: University of Michigan Press.

Armstrong, D.A. & Duch, R.M. (2010). Why can voters anticipate post-election coalition formation likelihoods? *Electoral Studies*, *29*(3): 308–315.

Bargsted, M.A. & Kedar, O. (2009). Coalition-targeted Duvergerian voting: How expectations affect voter choice under proportional representation. *American Journal of Political Science*, *53*(2): 307–323.

Bender, A. & Bauer, A. (2018). coalitions: Coalition probabilities in multi-party democracies. *Journal of Open Source Software, 3*(23): 606.

Benoit, K., Watanabe, K., Wang, H., Nulty, P., Obeng, A., Müller, S. & Matsuo, A. (2018). quanteda: An R package for the quantitative analysis of textual data. *Journal of Open Source Software, 3*(30): 774.

Best, V. (2015). *Koalitionssignale bei Landtagswahlen: Eine empirische Analyse von 1990 bis 2012.* Baden-Baden: Nomos.

Blais, A., Aldrich, J.H., Indridason, I.H. & Levine, R. (2006). Do voters vote for government coalitions? Testing Downs' pessimistic conclusion. *Party Politics*, *12*(6): 691–705.

Bowler, S., Karp, J.A. & Donovan, T. (2010). Strategic coalition voting: Evidence from New Zealand. *Electoral Studies*, *29*(3): 350–357.

Bowler, S., Bräuninger, T., Debus, M. & Indridason, I.,H. (2016). Let's just agree to disagree: Dispute resolute mechanisms in coalition agreements. *The Journal of Politics, 78*(4): 1264–1278.

Bowler, S., Gschwend, T. & Indridason, I.H. (2020). Coalition policy perceptions. *The Journal of Politics 82*(4): 1458–1473.

Bowler, S., McElroy, G. & Müller, S. (2018). Voter preferences and party loyalty under cumulative voting: Political behaviour after electoral reform in Bremen and Hamburg. *Electoral Studies 51*: 93–102.

Bräuninger, T., Debus, M., Müller, J. & Stecker, C. (2020). *Parteienwettbewerb in den deutschen Bundesländern.* 2nd edition. Wiesbaden: Springer VS.

Breiman, L. (2001). Random forests. *Machine Learning 45*(1): 5–32.

Cox, G. (1997). Making votes count. Strategic coordination in the world's electoral systems. Cambridge: Cambridge University Press.

Debus, M. (2009). Pre-electoral commitments and government formation. *Public Choice*, *138*(1–2): 45–64.

Debus, M. & Müller, J. (2013). Do voters' coalition preferences affect government formation? *West European Politics*, 36(5): 1007–1028.

Debus, M. & Müller, J. (2014). Expected utility or learned familiarity? The formation of voters' coalition preferences. *Electoral Studies*, *34*: 54–67.

Downs, A. (1957). An economic theory of democracy. New York: Harper & Row.

Duch, R.M., May, J. & Armstrong, D.A. (2010). Coalition-directed voting in multiparty democracies. *American Political Science Review*, *104*(4): 698–719.

Elkink, J.A., Farrell, D.M., Marien, S., Reidy, T., & Suiter, J. (2020). The death of conservative Ireland? The 2018 abortion referendum. *Electoral Studies, 65*: 102142.

Fisher, S.D. & Hobolt, S.B. (2010). Coalition government and electoral accountability. *Electoral studies*, *29*(3): 358–369.

Fortunato, D., Stevenson, R.T. & Vonnahme, G. (2016). Context and political knowledge: Explaining cross-national variation in partisan left-right knowledge. *The Journal of Politics*, *78*(4): 1211–1228.

Gelman, A. (2008). Scaling regression inputs by dividing by two standard deviations. *Statistics in Medicine 27*(15): 2865–2873.

Golder, S.N. (2005). Pre-electoral coalitions in comparative perspective: A test of existing hypotheses. *Electoral Studies, 24*(4): 643–663.

Golder, S.N. (2006). Pre-electoral coalition formation in parliamentary democracies. *British Journal of Political Science, 36*(2): 193–212.

Gross, M. & Debus, M. (2018). Gaining new insights by going local: Determinants of coalition formation in mixed democratic polities. *Public Choice, 174*(1–2): 61–80.

Gschwend, T. & Meffert, M.F. (2017). Strategic voting. In Arzheimer, K., Evans, J., and Lewis-Beck, M.S. (eds.). *The SAGE Handbook of Electoral Behaviour (Vol. 2)* (pp. 339–366). (pp. 339-66). The SAGE Handbook of Electoral Behaviour. London: SAGE.

Gschwend, T., Meffert, M.F. & Stoetzer, L.F. (2017). Weighting parties and coalitions: How coalition signals influence voting behavior. *The Journal of Politics*, *79*(2): 642–655.

Hobolt, S.B. & Hoerner, J.M. (2020). The mobilising effect of political choice. *European Journal of Political Research,* *59*(2): 229–247.

Ibenskas, R. (2016). Understanding pre-electoral coalitions in Central and Eastern Europe. *British Journal of Political Science,* *46*(4): 743–761.

Indridason, I.H. (2011a). Coalition formation and polarisation. *European Journal of Political Research*, *50*(5): 689–718.

Indridason, I.H. (2011b). Proportional representation, majoritarian legislatures, and coalitional voting. *American Journal of Political Science*, *55*(4): 955–971.

Irwin, G.A. & Van Holsteyn, J.J. (2012). Strategic electoral considerations under proportional representation. *Electoral Studies*, *31*(1): 184–191.

Kedar, O. (2005). When moderate voters prefer extreme parties: Policy balancing in parliamentary elections. *American Political Science Review,* *99*(2): 185–199.

Lago, I. (2008). Rational expectations or heuristics? Strategic voting in proportional representation systems. *Party Politics*, *14*(1): 31–49.

Liaw, A. & Wiener, M. (2002). Classification and regression by randomForest. *R News* 2(3): 18–22.

Martin, L.W. & Stevenson, R.T. (2001). Government formation in parliamentary democracies. *American Journal of Political Science,* *45*(1): 33–50.

Martin, L.W. & Stevenson, R.T. (2010). The conditional impact of incumbency on government formation. *American Political Science Review,* *104*(3): 503–518.

Martin, L.W. & Vanberg, G. (2003). Wasting time? The impact of ideology and size on delay in coalition formation. *British Journal of Political Science*, *33*(2): 323–332.

McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In Zarembka, P. (ed.). *Frontiers in Econometrics* (pp. 105–142). New York: Academic Press.

Meffert, M.F. & Gschwend, T. (2010). Strategic coalition voting: Evidence from Austria. *Electoral Studies*, *29*(3): 339–349.

Meffert, M.F. & Gschwend, T. (2011). Polls, coalition signals and strategic voting: An experimental investigation of perceptions and effects. *European Journal of Political Research, 50*(5): 636–667.

Meffert, M.F., Huber, S., Gschwend, T. & Pappi, F.U. (2011). More than wishful thinking: Causes and consequences of voters' electoral expectations about parties and coalitions. *Electoral Studies*, *30*(4): 804–815.

Pedersen, M.N. (1979). The dynamics of European party systems: Changing patterns of electoral volatility. *European Journal of Political Research*, 7(1): 1–26.

Powell, G.B. (2000). *Elections as instruments of democracy: Majoritarian and proportional visions*. New Haven: Yale University Press.

Rasmussen, S.H.R. & Nørgaard, A.S. (2018). When and why does education matter? Motivation and resource effects in political efficacy. *European Journal of Political Research*, *57*(1): 24–46.

Reif, K. & Schmitt, H. (1980). Nine second-order national elections: a conceptual framework for the analysis of European Election results. *European Journal of Political Research, 8*(1): 3–44.

Searles, K., Smith, G. & Sui, M. (2018). Partisan media, electoral predictions, and wishful thinking. *Public Opinion Quarterly*, *82*(S1): 888–910.

Snyder, R. (2001). Scaling down: The subnational comparative method. *Studies in Comparative International Development, 36*(1): 93–110.

Stoetzer, Lukas F. & Orlowski, M. (2020). Estimating coalition majorities during political campaigns based on pre-election polls. *Journal of Elections, Public Opinion and Parties 30*(1): 126–137.

Tavits, M. (2008). On the linkage between electoral volatility and party system instability in Central and Eastern Europe. *European Journal of Political Research*, *47*(5): 537–555.

Watanabe, K. (2018). Newsmap: A semi-supervised approach to geographical news classification. *Digital Journalism, 6*(3): 294–309.

Zaller, J.R. (1992). *The nature and origins of mass opinion*. Cambridge: Cambridge University Press.

# Voter Expectations of Government Formation in Coalition Systems: The Importance of the Information Context

## Supporting Information

## A    Predicting the Probability of a Majority of Seats

We estimate the probability of a coalition to have a majority based on aggregating opinion polls (see extensively Bender and Bauer, 2018). Figure A 1 shows how the probability of a majority for one or more parties changes when considering only minimal-winning coalitions or also surplus majority governments, i.e. coalitions that include more parties than required for a majority. One example clarifies this difference: If a coalition between SPD and the CDU already has an estimated probability of 100 per cent to gain a majority of seats in parliament, adding the FDP to this coalition would not change the majority. The x-axis shows the probabilities if we assign the value 0 to surplus governments (because in Germany surplus governments are highly unusual). The y-axis gives all surplus governments the value 100, even if at least two of these parties already have an estimated probability of 100 percent to gain a majority of seats. The coefficients of the *Probability of a Majority* decrease slightly in our conditional logit models when we assign a probability of 100 to surplus governments. This is not surprising as, for instance, a coalition of CDU and SPD with a clear majority would not add a third party to the cabinet. In the main part of the paper, we opt for the more conservative estimate which assigns a probability of 100 per cent to surplus majority governments.

*Figure A 1: Comparing the probabilities of majorities for coalitions based on the inclusion or exclusion of surplus majority governments. Small random noise added to each point to avoid overplotting.*
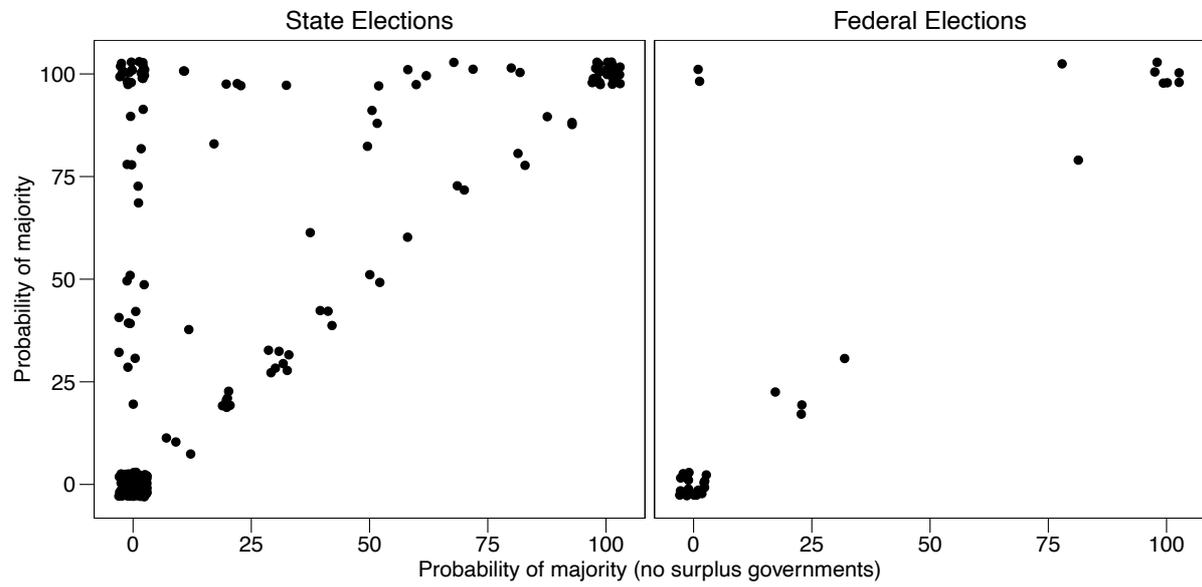
# B    Estimating coalition signals in newspapers

*Coalition Signals in Newspapers* is one of the central independent variables in our article. We use quantitative text analysis to analyze pre-electoral coalition signals using a large corpus of media reports about the relationship between parties. The analysis was conducted with the following approach:

1. Download all available German newspaper articles between January 2009 and December 2017 from *NexisLexis* that mention at least one of the main political parties, or at least one of the potential coalition formats, as well as a term that indicates working together in a coalition (coalesce, work together, coalition, alliance), and the term federal or state election.[14]

2. Import the 15,980 relevant downloaded articles as a *quanteda* (Benoit et al., 2018) text corpus.

3. Create a dictionary containing geographical terms for each German state (e.g. name of state, capitol of state) and terms about the federal political level (e.g. name of chancellor, Berlin, Bundestag). Apply this dictionary to the text corpus using *Newsmap*, a semi-supervised approach to geographical news classification (Watanabe, 2018). Based on the full text, each article gets assigned to the federal or state level. If an article is classified as reporting about the state level, the name of the state that is most likely to be reported about is also added as a document-level variable.

4. Reshape the text corpus to the level of sentences resulting of a corpus with 760,161 documents. Each document contains one sentence.

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[14] The following expression is the original query: "koalition* OR zusammen arbeiten OR koalieren OR Bündnis AND CDU OR CSU OR SPD OR Sozialdemokraten OR Linke OR Linkspartei OR Grünen OR Grüne OR Piraten OR Piratenpartei OR AfD OR FDP OR Südschleswigscher Wählerverband OR schwarz-rot* OR rot-grün* OR schwarz-gelb* OR sozialliberal* OR Ampel OR rot-rot OR rot-rot-grün* OR schwarz-grün*AND Bundestagswahl* OR Landtagswahl* OR Bürgerschaftswahl*".

5. Apply a dictionary with names of the parties or coalitions to each sentence. If a sentence contains a word indicating cooperation, governing together or signaling a coalition[15], and at least two terms about two different parties, the sentence is assigned to one of the potential coalitions. If a sentence explicitly mentions one coalition option (e.g. "grand coalition", "red-green coalition") and a term indicating cooperation, the sentence is also classified as discussing a potential government. 19,889 sentences are classified as relevant, i.e. they contain the names of at least two parties/a coalition and a word indicating cooperation. Figure A 2 lists the most frequent words and phrases in the sentences that have been classified as relevant, i.e. that mention at least two parties or a coalition and a term indicating cooperation. The most frequent terms strengthen the face validity of the classification. Party names and descriptions of coalition, such as red green (a coalition between the SPD and Greens) or grand coalition for a coalition between the CDU/CSU and SPD, are among the most frequent words. Moreover, terms like percentage, federal election, government, continuation, end, question, federal, state election, bundestag indicate that the sentences indeed capture upcoming German elections and coalitions.

6. For each of the 22 elections (19 state and 3 federal elections) subset all articles that are about the respective state/federal level based on the *Newsmap* classification. Filter all articles published within two years before the start of the respective GLES survey reporting about this state/the federal level.

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[15] We selected the following "glob"-style wildcard expression as terms indicating cooperation or a coalition: "koali*", "eingeh*", "regier*", "koooper*", "arbeit*", "bündnis*". The wildcard matches ensure that terms such as Koalition (coalition) and koalieren (coalesce) would be picked up with the wildcard expression "koali*". While the choice of keywords can certainly be extended or refined, all of these terms usually indicate some form of cooperation and avoid too many false-positive matches.

7. Group the dataset by classified coalitions and count the number of mentions for each government option.

8. Merge the aggregated data for each election with the survey dataset. For each coalition option to be evaluated by the respondents, we count the number of classified newspaper mentions for this government option during the two years before the election.

9. To make the measure comparable across elections, we rescale the variable to a 0–100 scale for each election. A value of 0 means that potential coalition partners have not been mentioned at all in the two years prior to an election; a value of 100 implies that all mentions were devoted to the same government option. Note that we scale this variable by dividing by two standard deviations for the conditional logit regressions. This procedure makes the variable more comparable to the dummy variables in the regression (Gelman, 2008).

*Figure A 2: The 50 most frequent terms and multi-word expressions in sentences classified as containing signals for a coalition option*
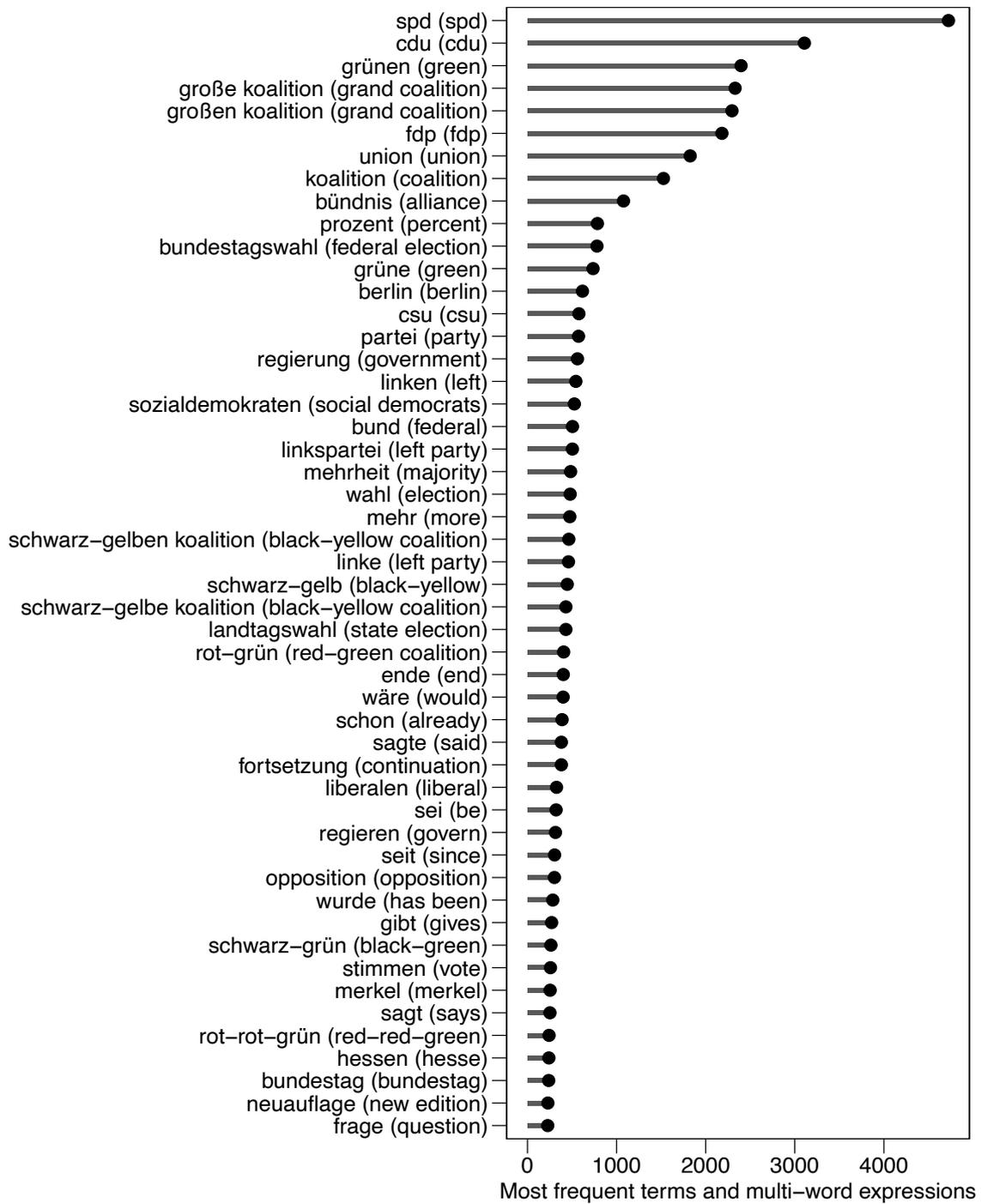
# C    The impact of the survey instrument

The survey instruments differ across elections. Six state elections and the 2017 federal have an entirely open question format and simply ask respondents to name which party or parties will govern after the election ("Government parties: binary"). Three state elections and the 2009 federal election ask respondents to choose one coalition from a pre-defined set of choices ("Coalitions: binary"). The remaining 10 state elections and the 2013 federal election present respondents with a set of 5–10 coalition options, and respondents need to evaluate the likelihood that each coalition will govern ("Coalitions: continuous"). Figure 2 in the paper plots the proportion of correct predictions for each of the question formats. While it is not possible to completely disentangle the effects based on the survey instrument from election-specific factors, we clearly observe, both for the federal and state elections, that respondents are much more likely to predict the correct coalition when potential coalitions are presented in the binary format and respondents must select one. When coalitions predict the probability of governments based on the continuous scales, the proportion of correct predictions decreases substantively hovering at around 20 per cent. For the binary question of the government party/parties, we observe similarly low degrees of accuracy compared to the continuous coalition scale for state elections, but a higher proportion for the 2017 federal election. The survey instrument seems to have an impact on correct predictions. Future work should consider randomly varying the wording *within* an election survey, as, we cannot entirely disentangle election-specific effects from survey instrument effects here.

As described in the main part of the paper, the survey instruments differ across elections. 10 state elections and the 2013 federal election present respondents with a set of 5–10 coalition options, and respondents need to evaluate the likelihood that each coalition will govern ("Coalitions: continuous"). We check whether the number of coalitions to be evaluated influences the predictive accuracy. One could imagine that evaluating more coalitions results

in lower chances of getting it right. However, Figure A 3 does not offer evidence for such an effect. We do not observe any consistent trends due to the number of government options presented to respondents.

*Figure A 3: Controlling for survey instrument effects due to variation in the number of governments to evaluate in terms of the probability of governing after an election (in the continuous question format).*
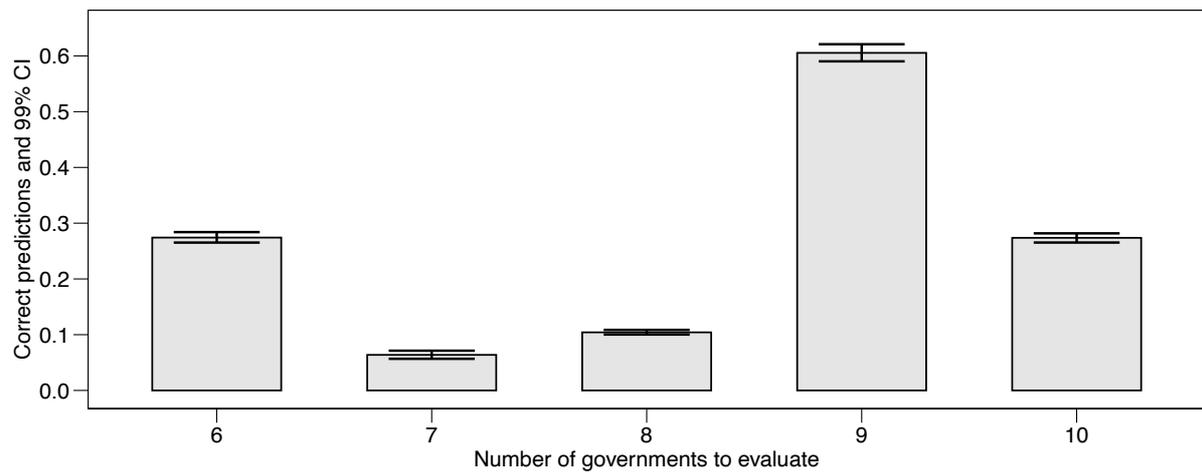


*Note: Figure shows the proportion of correctly predicted coalitions based on the numbers of coalitions that a respondent needed to evaluate in the survey. Vertical error bars show 95 per cent confidence intervals.*

# D Predicting "don't know" responses or missing answers

What drives missing answers in the prediction of governments? The main driver of "don't know" responses is the manner in which the question on coalition predictions is asked. When respondents are presented with a variety of possible coalitions and need to assess the likelihood of the coalition to be formed, missing answers are on the lowest levels (Figure A 4). Missing values increase when respondents should select one or more parties that will govern after the election. The highest values (between 10 and 22 per cent) of missing values occurred in election studies that force respondents to choose one coalition from a pre-defined set of choices ("Coalitions: binary").

*Figure A 4: Percentage of "don't know/no answer" responses for coalition prediction question*
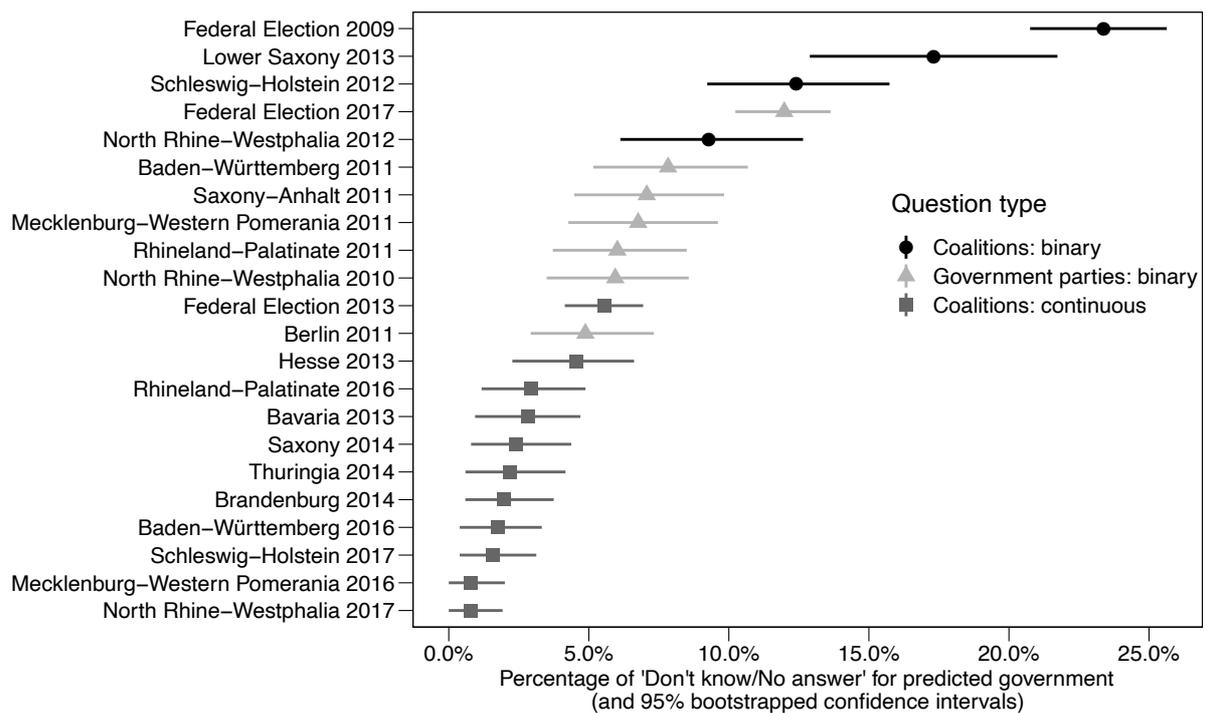


We ran a multilevel logistic regression with a dummy indicating whether or not a respondent predicted a coalition. Models 1 and 2 of Table A 1 show that respondents in surveys on Land elections are more likely to reply "don't know" to the question on predicted coalitions, when compared with federal election survey respondents. Moreover, if respondents are explicitly asked for the party or parties that will form the government (Coalitions – Binary).

Respondents with no interest at all in the campaign are also most likely not to reply to the question on predicted governments. Male respondents are significantly more likely to predict a coalition than female respondents, and respondents with lower education (No A-Levels) are more likely not to predict a coalition.

*Table A 1: Predicting missing answers in the coalition prediction survey item*

| | Model 1 | Model 2 |
|---|---|---|
| Prediction Question: Coalitions - Continuous (ref.: Coa. - Binary) | -1.84 (0.15)*** | -1.87 (0.16)*** |
| Prediction Question: Government Parties - Binary | -0.78 (0.14)*** | -0.90 (0.17)*** |
| State election | -0.80 (0.13)*** | -0.78 (0.15)*** |
| Interest in the Election: Not much (ref.: No interest at all) | | -0.76 (0.09)*** |
| Interest in the Election: Medium | | -1.18 (0.09)*** |
| Interest in the Election: Strong | | -1.63 (0.10)*** |
| Interest in the Election: Very strong | | -1.81 (0.15)*** |
| Female | | 0.38 (0.06)*** |
| Education: No A-Levels | | 0.31 (0.08)*** |
| AIC | 8871.93 | 7802.66 |
| BIC | 8910.54 | 7886.99 |
| Log Likelihood | -4430.97 | -3890.33 |
| Num obs. | 16653 | 15778 |
| Num groups: Elections | 22 | 22 |

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

# E    The most distant parties in coalitions

We measure the perceived distance between government parties as the absolute distance between the left-right position of the most left and most right party of a coalition. To ensure comparability, we specified the most left and right party for each coalition option in our sample. Table A 2 reports, for all coalitions, which party was regarded as the most right party (first party) and the most left party (second party).

*Table A 2: The coding of the most left and most right party in various potential governments*

| Coalition | Most distant parties |
|---|---|
| CDU, AfD | AfD - CDU |
| CDU, FDP | CDU - FDP |
| CDU , FDP, Greens | CDU - Greens |
| CDU, Greens | CDU - Greens |
| CDU, SPD | CDU - SPD |
| CDU, FW | CDU - FW |
| SPD, FDP | FDP - SPD |
| SPD, FDP, Greens | FDP - Greens |
| SPD, Greens | SPD - Greens |
| SPD, Left | SPD - Left |
| SPD, Greens, FW | FW - Greens |
| SPD, FDP | SPD - FDP |
| SPD, Left, Greens | SPD - Left |
| CDU, AfD | CDU - AfD |
| CDU | (no distance) |
| SPD | (no distance) |

## F    Predicting the government in state elections

The results in the paper are based on separate conditional logistic regression models for each election. We repeat the analysis by aggregating all elections into a single dataset and running only one model. We cluster the observation by elections. First, we turn to the 15 state elections for which we have measures for the predicted government, as well as the desired government.[16] Model 1 of Table A 3 is the basic model that includes both the *Desired Government* and the *Probability of Majority* and controls for the *Incumbent Government* and the ideological distance between the two most extreme parties in a coalition.

We observe strong and robust "*Wishful Thinking*" effects in state elections across all model specifications. A respondent is much more likely to predict the government that is also his desired government. The smallest observed coefficient of 1.21 for *Desired Government* in the more conservative model corresponds to an odds ratio of 3.3. In substantive terms, the government option that is a respondent's desired coalition is around 3.3 times more likely to be the predicted coalition, all other variables held constant. The *Probability of a Majority* has the expected positive influence on predicting a government over all alternative governments. The *Incumbent Government* also has a higher probability of being selected as the predicted coalition. The *Perceived Subjective Distance* between the between the parties has the expected negative coefficient. If the absolute distance in terms of left-right positions between a choice of parties increases, a respondent is less likely to predict this government option.

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[16] Five surveys do not contain the items required to construct the measure for the desired coalition.

*Table A 3: Predicting which government option is selected as the predicted coalition from the choice set of all coalitions. The models only include the state elections. Robust standard errors clustered by election.*

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Desired Government | 1.23 (0.12)*** | | 1.22 (0.12)*** | 1.93 (0.10)*** |
| Probability of a Majority (stand.) | 0.27 (0.06)*** | 0.27 (0.07)*** | 0.23 (0.06)*** | 0.55 (0.19)** |
| Incumbent Government | 0.57 (0.11)*** | 0.71 (0.12)*** | 0.31 (0.22) | 0.81 (0.27)** |
| Perceived Distance Between Parties (stand.) | -0.35 (0.09)*** | -0.54 (0.10)*** | -0.35 (0.09)*** | -0.73 (0.09)*** |
| Ideological Distance Government and Respondent (stand.) | | -0.48 (0.08)*** | | |
| Coalition Signals in Newspapers (stand.) | | | 0.22 (0.12) | 0.38 (0.15)* |
| AIC | 107542.33 | 120148.01 | 107458.11 | 18483.95 |
| $R^2$ | 0.07 | 0.04 | 0.07 | 0.11 |
| Max. $R^2$ | 0.75 | 0.74 | 0.75 | 0.37 |
| Num. events | 20473 | 22462 | 20473 | 5852 |
| Num. obs. | 81649 | 92465 | 81649 | 55026 |
| Missings | 25481 | 14665 | 25481 | 15019 |

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Model 2 replicates Model 1, but we replace the *Desired Coalition* dummy variable with a continuous measure of the distance between left-right self-placement and the respondent's perception of the left-right ideology of a given government option. We observe a negative and statistically significant effect, which mirrors the findings from Model 1. If a government is perceived to be ideologically distant from a respondent, she is *less* likely to predict this coalition option. Model 3 and 4 add the *Positive Coalition Signals*, derived from the quantitative text analysis of media reports. When pooling all elections, the relationship is positive, but not statistically significant. Note that *Positive Coalition Signals* and *Incumbent Government* tend to be multicollinear since incumbent parties are usually portrayed as being

cooperative and being willing to form a coalition in the upcoming cycle. Removing incumbent government from the model leads to larger and statistically significant estimates.

Recall that the continuous measures of the assumed likelihood of a government to be formed can result in more than one prediction if a respondent gives two or more coalitions the same score.[17] Model 4 restricts the sample to those respondents who predicted just one coalition which increases the size of the coefficients.

# G    Predicting the government in federal elections

Next, we reproduce the models described above for the three federal elections in 2009, 2013, and 2017 (Table A 4). The coefficients for the three federal elections are in the same direction as the coefficients for the state elections, but the sizes of the coefficients are usually larger. Again, the *Desired Government* and the alternative measure of the ideological proximity between a respondent and the government have the expected effects. The coefficient of *Probability of a Majority* is also much larger than for the state elections. These differences indicate that respondents seem to be more aware of arithmetically (im)possible governments in first-order elections. This finding is unsurprising as media coverage about federal elections is far more extensive, and polling results for the federal level are conducted and reported weekly. The *Incumbent Government* effect is however not significant at the federal level, in contrast with the state level elections. The reason for the difference between the state and federal level is probably a result of the decline of the Free Democrats (FDP) prior to the 2013 election. This junior coalition partner between 2009 and 2013 lost public support and it seemed unlikely that the governing coalition could remain in office. Therefore, respondents tended to (correctly) predict a "Grand coalition" between the CDU/CSU and SPD and did not forecast a continuation of the CDU/CSU and FDP.

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[17] Randomly drawing one of these options and ignoring the other coalitions does not change the results.

In the federal elections, the *Perceived Distance Between Parties* has the expected negative effect. Governments with larger differences are less likely to be the predicted coalition. *Coalition Signals in Newspapers* also exerts a positive and sizeable influence on coalition predictions, especially when focusing only on respondents who predicted one coalition (Model 4).

*Table A 4: Predicting which government option is selected as the predicted government from the choice set of all governments. The models only include the federal elections. Robust standard errors clustered by election.*

|  | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Desired Government | 1.36 (0.32)*** |  | 1.26 (0.30)*** | 1.50 (0.10)*** |
| Probability of a Majority (stand.) | 0.94 (0.23)*** | 0.85 (0.22)*** | 0.50 (0.28) | 0.52 (0.36) |
| Incumbent Government | 1.02 (0.28)*** | 1.14 (0.30)*** | -0.01 (0.53) | -0.47 (0.85) |
| Perceived Distance Between Parties (stand.) | -0.92 (0.30)** | -0.94 (0.31)** | -0.87 (0.31)** | -1.13 (0.25)*** |
| Ideological Distance Government and Respondent (stand.) |  | -0.48 (0.05)*** |  |  |
| Coalition Signals in Newspapers (stand.) |  |  | 1.04 (0.22)*** | 1.58 (0.36)*** |
| AIC | 18371.45 | 25098.92 | 18001.00 | 10784.00 |
| $R^2$ | 0.12 | 0.09 | 0.13 | 0.16 |
| Max. $R^2$ | 0.48 | 0.52 | 0.48 | 0.40 |
| Num. events | 6173 | 6700 | 6173 | 4500 |
| Num. obs. | 35004 | 39613 | 35004 | 31481 |
| Missings | 8432 | 3823 | 8432 | 6117 |

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

# I    Robustness Tests

Figure A 5 reproduces Figure 4, but instead of the *Desired Government* we use the *Ideological Distance Between a Respondent and the Government Option*. A lower value indicates that a respondent's ideological left-right position is close to the perceived left-right position of the government option. If the "wishful thinking' assertion holds, we should observe a negative effect: a larger distance makes it less likely that a respondent predicts this option. Indeed, we find negative coefficients in 15 out of 18 elections, confirming that our conclusions regarding *Wishful Thinking* effects do not depend on the measurement of a *Desired Government*.

*Figure A 5: Predicting which government option is selected as the predicted government from the choice set of all governments. The coefficients are derived from 22 models, one for each election in the sample that includes information on the desired government.*
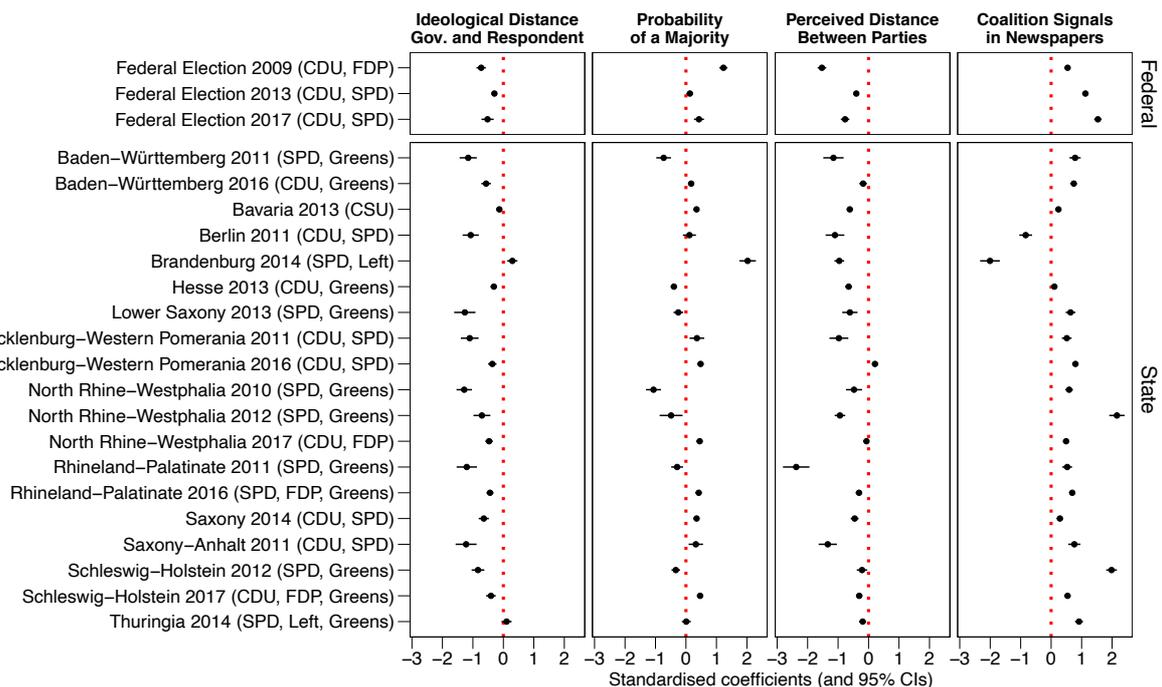


In additional models we also account for common and previously formed coalitions. Figure A 6 lists the coalitions that have been formed on the Land level between January 1990 and May 2017 (106 governments), along with the number of formed coalitions. Note that this list does not distinguish between the party of the prime minister and smaller coalition parties. More

precisely, coalitions between CDU and the SPD (with a CDU prime minister) and a coalition between the SPD and CDU (with an SPD prime minister) are counted as the same coalition. We follow this approach given that respondents in the surveys are asked for their predicted coalition and not (necessarily) which party will be the largest party in the government. We also recoded CSU to CDU in order to merge all formed coalitions with the harmonised coalition options presented to respondents. The plot shows that grand coalitions between the CDU and SPD, coalitions between the SPD and Greens, and coalitions between the CDU and FDP have been the most common governments in German states between 1990 and 2017. For the regression analysis, we code the six governments that have been formed at least five times as "typical" governments for German state and federal elections.[18]

*Figure A 6: The frequency of coalitions that have been formed on the land level between 1990 and 2017*
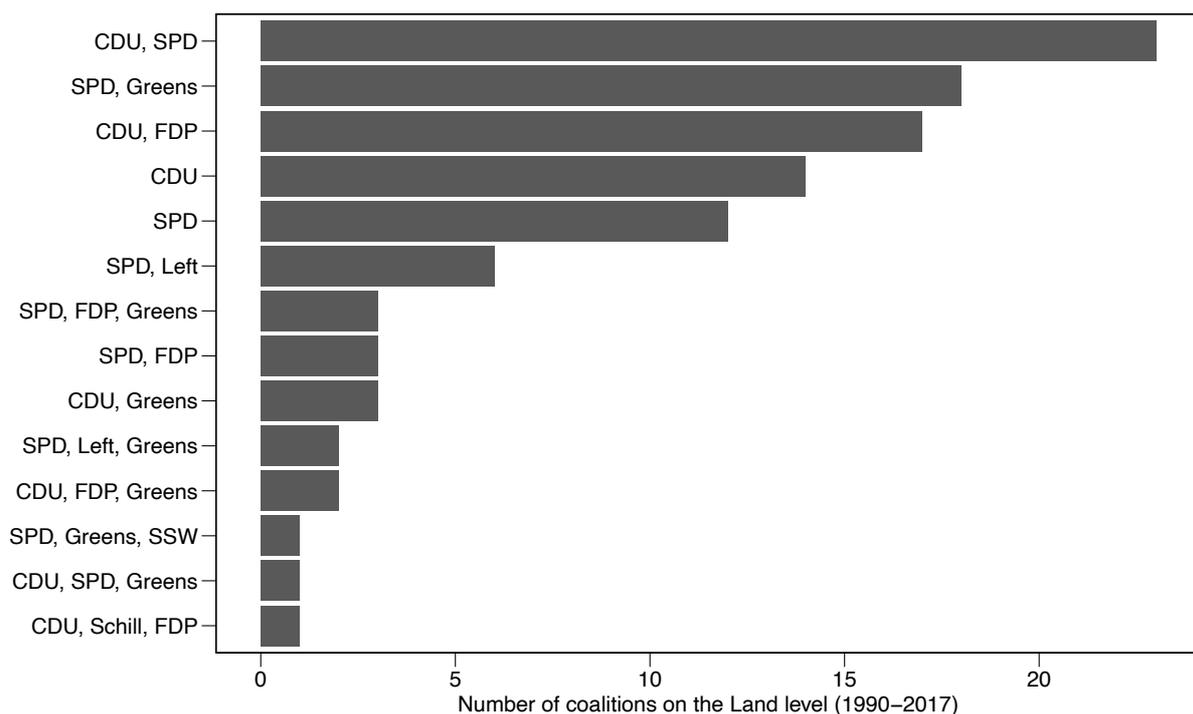


We use this binary variable of coalitions that have been formed at least five times as a measure of common coalitions, add this variable to the conditional logit regression and interact the measure with the *Probability of a Majority* to test whether common coalitions with a high

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[18] These governments are CDU, SPD; SPD, Greens; CDU, FDP; CDU; SPD; SPD, Left.

probability of obtaining a majority of seats are more likely to be selected by respondents. The coefficients in Figure A 7 suggests that this tends to be the case in the majority of elections.

*Figure A 7: Predicting which government option is selected as the predicted government from the choice set of all governments. The coefficients are derived from 22 models, one for each election in the sample that includes information on the desired government. All models include an interaction between common coalitions and the probability of a majority of seats.*
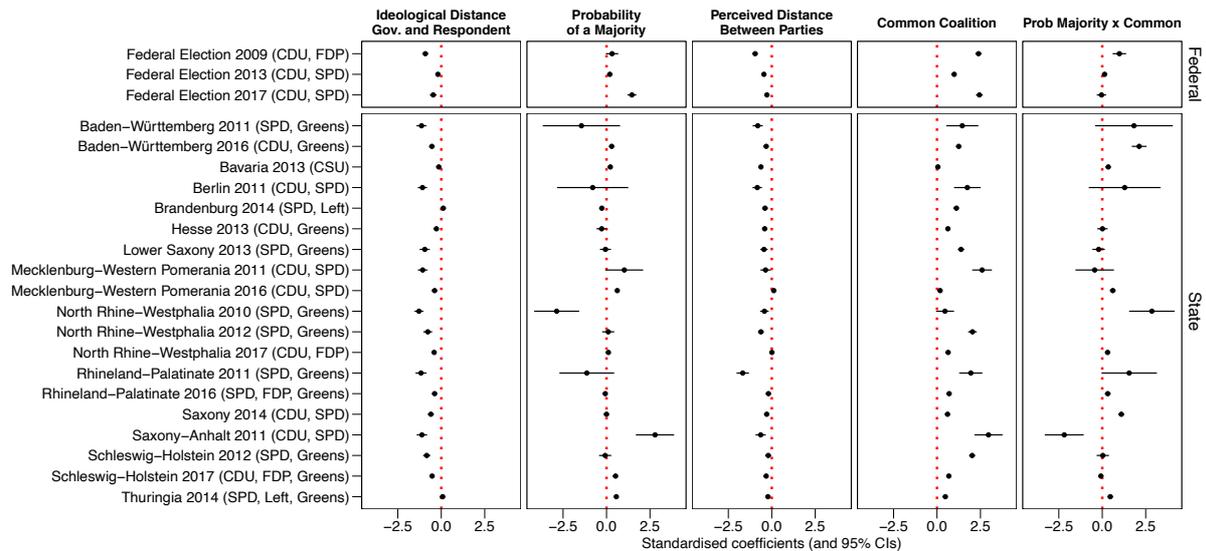


We consider the left-right placements of parties by individual respondents as the most suitable measure for the *Perceived Distance Between Parties* and also the best measure for the distance between a coalition's left-right position and the respondent's left-right position (*Ideological Distance Government and Respondent)*. However, as a robustness test we also estimate the left-right positions of parties, the left-right distance between coalition parties, and the average left-right position of a coalition using Wordscores, a supervised method for scaling of party positions. We rely on the Wordscores estimates of all manifestos from German state elections between 1990 and 2019 provided by Bräuninger et al. (2020).

First, it is worthy of note that the Wordscores left-right positions and voters' placements of the parties correlate very highly. Across the 19 subnational elections, the correlations range

between 0.89 and 0.99 (Figure A 8).[19] The left-right distance between the two most extreme parties also correlates highly ($r$=0.73) when comparing distances derived from Wordscores and from party placements by voters (Figure A 9).

Second, we rerun the conditional logit models using Wordscores estimates for the 19 subnational elections. The substantive results remain the same for all elections, and the directions of the remaining coefficients do not change when using the variables based on Wordscores positions (Figure A 10). Only in one of the 19 elections, a larger ideological distance between the respondent and the average left-right position of the coalition (based on Wordscores) increases the probability of selecting this government option, offering further support for the "wishful thinking" hypothesis. The ideological distance between the parties, based on Wordscores estimates, also has the expected negative effect in most elections. The findings regarding party-level characteristics are robust to evaluations by voters or latent positions derived from political text.

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[19] Note that Bräuninger et al. (2020) use survey ratings by experts as the reference scores for the Wordscores algorithm and not by using voter placements. The high correlations are thus not circular and not an artefact of identical measurement.

*Figure A 8: Correlations between party placements by voters and Wordscores estimates of state election manifestos*
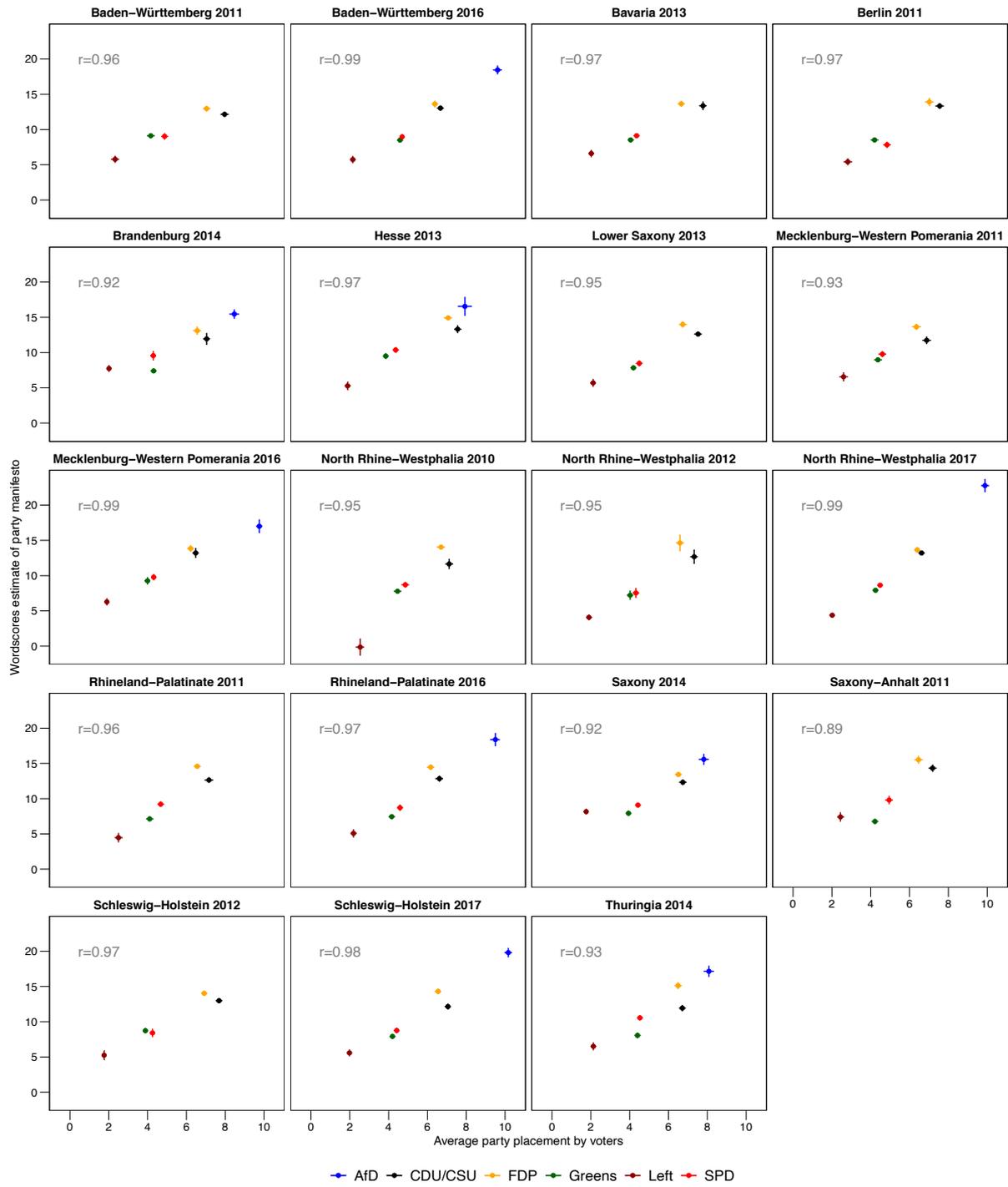
*Figure A 9: Comparing perceived distances between the two most extreme parties in a coalition based on respondents' evaluations and Wordscores estimates*
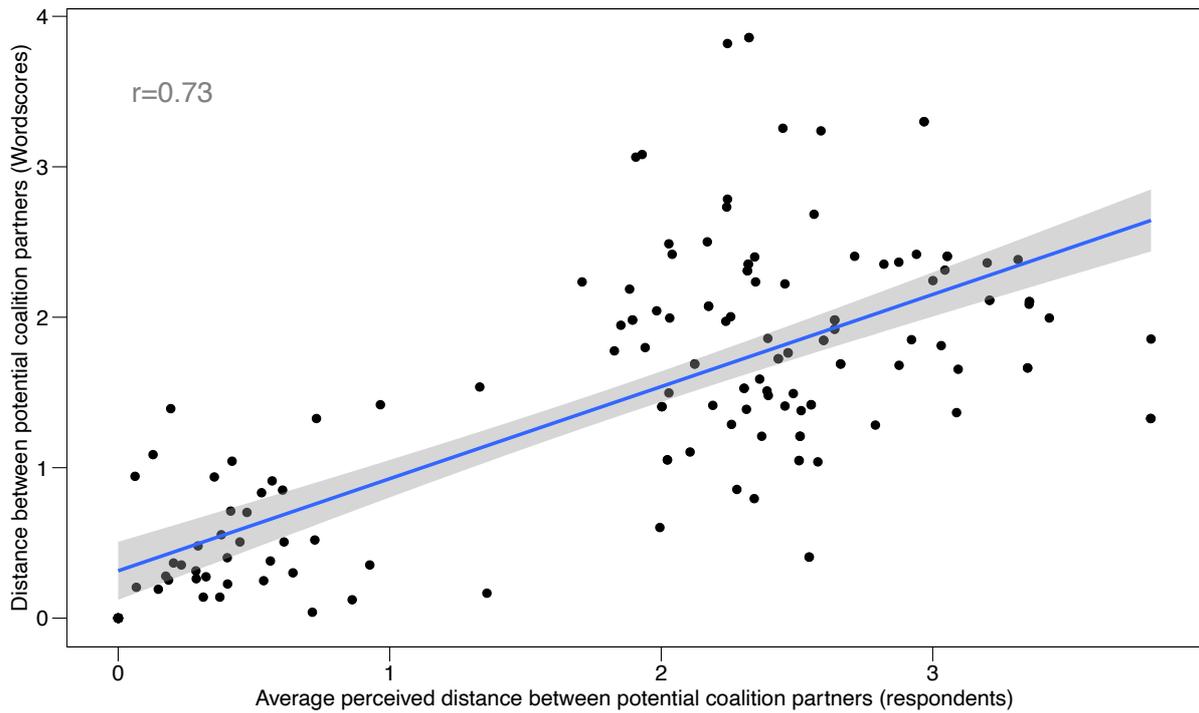


*Figure A 10: Predicting which government option is selected as the predicted government from the choice set of all governments. The coefficients are derived from 19 models, one for each state election in the sample. The ideological measures are based on Wordscores estimates, rather than evaluations by the respondents*