Campaign Effects on Strategic Voting for Minor Parties in Germany

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Abstract

This study uses a novel campaign effects model of strategic voting for minor parties in multiparty democracies that compares the relative importance of coalition insurance voting, compensatory voting, and a hybrid strategy. To do so, it uses data on the 2013 and 2017 German federal elections from campaign-period surveys, polls and an original dataset of the candidates' tweets about policy issues. The results show evidence of policy-driven voters using a hybrid strategy in 2013 and a compensatory strategy in 2017. There is no evidence of coalition insurance voting in these elections. These findings reaffirm the view that the campaign plays a crucial role in the decision-making process of voters, in this case by allowing them to target coalitions based on policy. Yet, the implications of these findings for electoral outcomes are limited: depending on the case, 0.5% to 1.7% voters are estimated to be strategic.

1 Introduction

Campaigns serve an essential democratic function by delivering information to the voters and allowing them to cast a vote that is aligned with their policy preferences. However, just how much campaigns matter in "enlightening" the vote has been a subject of controversy. The dominant view in the literature on campaign effects has been, until recently, that campaigns have at most "minimal effects"(A. Campbell, 1960; J. E. Campbell, 2008; Gelman & King, 1993; Holbrook, 1996). Campaigns would serve merely to activate long-term "fundamental" forces, like party identification and the state of the economy. Under this perspective, voters use cognitive shortcuts like party labels and the performance of the incumbent to infer which party represents best their policy preferences. More recently, some scholars have shown that the particular policy issues debated during the campaign do have an effect on voter decision-making, notably through priming, learning or persuasion (Fournier et al., 2019; Highton, 2006; Johnston, 1992; Johnston et al., 2004; Nadeau et al., 2008; Niemi & Weisberg, 1993; Vavreck, 2009). Nonetheless, the literature on campaign effects is confined to the U.S. case for the most part, and there are reasons to think that policy signals during campaigns have a greater impact outside this bipartisan and highly polarized system.

Democracies with multiple parties complicate the vote decision because they tend to produce formal or informal coalition governments, thus policy congruence with the party that

wins a plurality of the vote is not sufficient to guarantee congruence with the policy of the government. The classic spatial models of voters choosing between electoral platforms are not very useful in this context. How do voters decide then? Policy-driven voters must consider how coalition bargaining will affect the policies of the government. Voters driven by other strategic motivations must also consider how the power of their preferred party in the parliament will be affected by executive power-sharing. Hence executive power-sharing creates incentives for voters to strategically target a coalition by voting for another party than their first preference. In fact, a wealth of research shows that voters take into account the coalition formation process in their vote decision (Bargsted & Kedar, 2009; Blais et al., 2006; Bowler et al., 2020; Bowler et al., 2010; Duch et al., 2010; Fredén, 2014, 2016, 2017, 2021; Gschwend, 2007; Kedar, 2005b, 2009; Meffert & Gschwend, 2010). The electoral campaign contributes to this decision-making process by providing information about potential coalition partners, their electoral viability, and their policy agenda.

Recently, scholars have turned their attention to coalition-directed types of strategic voting. However, their theoretical framework and empirical strategy neglect the influence of the campaign on the decision-making process of voters. As a result, they cannot adjudicate between two types of strategic voting involving coalition partners with uncertain electoral outlooks: coalition insurance voting and compensatory voting. In both cases, a voter will choose a smaller coalition partner that has more extreme policies than their first preference. Yet in the first case, their goal is to ensure that their preferred party will lead the governing coalition, whereas in the second, the goal is to move the policies of the governing coalition closer to their ideal point. Put simply, the observed behaviour is compatible with both strategic motivations. What differentiates these two strategies is the underlying motivation and the type of information required to make a decision. Using campaign information in my model thus allows me to isolate policy-driven voting from strategic voting based on long-term sociological or psychological attachment. In sum, neglecting the role of the campaign in voter decision-making hinders our understanding of strategic voting as well as the importance of policy in the democratic process.

I address these theoretical shortcomings by defining the cognitive mechanisms that underlie the compensatory and the coalition insurance strategies. In doing so, I also address the possibility of a hybrid strategy. My objective is to test whether voters in multiparty systems use any or all of the following strategies: pure compensatory voting, pure coalition insurance voting, and compensatory/coalition insurance voting. To answer this question, I use data on the 2013 and 2017 German federal electoral campaigns. First, I present the scope conditions of these types of strategic voting by comparing the two elections. Then, I use a multinomial logistic regression to estimate the effects of the variables defining the three strategies on vote choice. I use exogenous variables, namely the poll shares and the issue statements of minor parties on Twitter during the campaign, to measure campaign information. By testing all the strategies at once, my model controls for correlation between the predictors of different strategies. The results show that there was compensatory/coalition insurance voting in 2013 and pure compensatory voting in 2017, but no pure coalition insurance voting.

2 Literature

The leading reference on compensatory voting is Kedar's (2005; 2005; 2009) work, which builds on Downs' spatial model to create a model with a parameter that discriminates between representational voting— based on ideological proximity with the electoral party platform —and compensatory voting, which is based on ideological proximity with the government's policy. Her theory posits that voters take into account how coalition bargaining "dilutes" their vote in power-sharing systems by selecting a party with more extreme policies than theirs in order to shift the policy of the governing coalition toward their ideal point. Indeed, coalition bargaining tends to pull policy outcomes toward the median voter, thus "voters will more often than not compensate toward the poles of the ideological scale rather than toward its center"(Kedar, 2009, p.27). The theory also accounts for the electoral strength of the parties (i.e. seat share), which determines their bargaining power in the parliament and their ability to affect policy outcomes. Her results confirm the hypothesis that the more parliamentary power-sharing, the more voters take into consideration the influence of a party in shaping policy outcomes after the election. Hence voters select parties with policies that are not the closest to their ideal when these parties can pull the center of gravity of the parliament closer. These findings are in line with the vote discounting literature that has originally focused on the American bipartisan system and thus speak to a general cognitive mechanism whereby voters take into account the moderating impact of the legislative process on policy outcomes (Adams et al., 2004; Alesina & Rosenthal, 1995; Grofman, 1985; S. Merrill & Grofman, 1999; Tomz & Van Houweling, 2008).

While Kedar's formal model is clever, the empirical strategy she employs is lacking. Its use of voter party placement on the ideological dimension, which tend to be relatively stable across time (Busch, 2016) biased by the voters' self-placement (Bauer et al., 2017) and their feelings toward parties (Drummond, 2011; Merrill et al., 2001), does not allow the identification of the parties' policy agendas' effect during a given electoral campaign. Even if voters could place parties accurately on a general left-right scale, the latter can hardly summarize their positions on a range of issues spanning multiple dimensions. In this context, the electoral campaign is crucial for getting information on the parties' policies. What is more, the data in Kedar (2005b) comes from post-election surveys, which is not a valid measure of voter attitudes and decision-making during the electoral campaign. The studies that build on this work (Duch et al., 2010; Fredén, 2021) have the same shortcomings.[1]

In parallel, scholars have investigated another type of coalition-directed strategy targeting minor parties, coalition insurance voting. Yet, there is no convincing attempt to disentangle coalition insurance voting from compensatory voting, which both yield the same behavioural outcome, i.e. a vote for a minor party with uncertain electoral viability whose policies are more extreme than the voter's. Under coalition insurance voting, the voter seeks to ensure that their preferred (major) party will lead the governing coalition by voting for a potential minor partner that is at risk of falling below the electoral threshold (Cox, 1997; Gschwend, 2007; Hobolt & Karp, 2010). The preference of a voter for a major party could be determined by many factors, including past performance in government, party identification, leader approval, expressing a particular worldview or ideology, etc. While a coalition insurance voter could prefer a major

[1]Fredén (2021) uses party feeling thermometers to measure policy proximity, which is an imprecise proxy because feelings toward parties could be influenced by other factors than policy.

party for its policy platform in a given election, their vote is not strictly policy-driven because it does not weigh in the post-election policy agenda of the governing coalition, which is the result of bargaining with minor partners. In contrast, compensatory voters are policy-driven because they target the actual policies of the governing coalition by taking into account the policy inputs of minor partners.

Despite the divergence in voter motivations for choosing a coalition insurance strategy or a compensatory strategy, this distinction is not made at a theoretical nor empirical level in the current literature. In Hobolt and Karp's (2010) meta-literature review, coalition insurance voting[2] is classified as a policy-maximizing strategy along with compensatory voting[3] without presenting the causal mechanisms that would differentiate them. It seems that classifying coalition insurance voting as a policy-maximizing strategy is not justified.[4] In fact, the cited studies on coalition insurance voting do not test for the influence of policy preferences on party or coalition preferences. If coalition insurance voting and compensatory voting are different strategies, the main motivation for coalition insurance voting ought to be ensuring that the preferred party leads the government, regardless of policy outcomes. For instance, Shikano et al. (2009), Fredén (2014), and Gschwend (2007) aim at testing for the presence of coalition insurance voting, but their model specification cannot tell us which type of strategic voting occurs since the only predictor related to strategic voting is expectations about minor party viability. Using a similar model specification that includes coalition preferences, Meffert and Gschwend (2010) do not test for the alternative theory of compensatory voting either.

The most important shortcoming of the studies on coalition insurance voting reviewed so far is that they use individual-level subjective expectations to measure electoral viability.[5] Numerous studies have found that subjective expectations are based on a mix of poll information and preference-driven projection (Abramson et al., 1992; Babad et al., 1992; Blais & Bodet, 2006; Bowler et al., 2010; Granberg & Brent, 1983; Johnston & Blais, 1992; Johnston & Vowles, 2006; Meffert & Gschwend, 2011; Meffert et al., 2011). Voters tend to overestimate the likelihood of reaching the electoral threshold for a party (or coalition) they like, and underestimate it for a party they dislike. A number of studies (Babad et al., 1992; Johnston & Blais, 1992; Meffert et al., 2011) also find that voters use their local political environment to infer the strength of a party at the national level, another source of bias. Perhaps unsurprisingly, voters with a lower level of political knowledge tend to have less accurate expectations (Blais & Bodet, 2006; Dolan & Holbrook, 2001; Meffert & Gschwend, 2011; Meffert et al., 2011). Moreover, Meffert et al. (2011) finds that rational considerations, like the strength of party preferences, can affect the motivation to seek accurate information. Hence in a statistical model of vote choice, the effect

[2]Referred as "threshold insurance voting" in Hobolt and Karp (2010).

[3]Referred as "policy balancing" in Hobolt and Karp (2010).

[4]This classification stems from Cox's (1997, Chap. 10) definition and example of threshold insurance voting, which is based on the pre-1980 party system of the Federal Republic of Germany in which there were only three parties in the Bundestag. In that system, in order for the CDU/CSU or the SPD to govern, it often required a coalition with the FDP. If the party did not have a plurality and a coalition with the FDP was not possible, the other large party would govern. Hence the success or failure of the coalition insurance strategy would fundamentally alter the policy agenda of the government. In contrast, today none of the large parties can govern alone. The configuration of party competition is such that major parties have to form three-party coalitions that are difficult to achieve and often end up forming a grand coalition.

[5]A small portion of the studies on coalition insurance voting use poll shares to measure electoral viability (Fredén, 2017; Fredén & Sohlberg, 2019; Meffert & Gschwend, 2011) and finds mixed evidence.

of subjective expectations is biased by these confounders. Controlling for such variables may be insufficient because of unobserved confounders and systematic measurement error. On the latter, there is evidence of question formulation effects that could induce a systematic bias in the survey responses; namely, when asked to evaluate the likelihood of passing the threshold, respondents tend to underestimate the chances of the parties near the threshold, and when asked to evaluate the likelihood of *failing* to pass the threshold, respondents tend to overestimate their chances (Yaniv et al., 2002).

Based on these considerations, we can build a theoretical model of subjective expectations that borrows from Kramer's (1983) work on sociotropic voting. Its theory is that subjective evaluations of the economic performance of the incumbent are made of an objective exogenous component— the actual government-induced change in the economy on a given day —and "perceptual noise" (Kramer, 1983, p.104). When observations are pooled across days, the greater variance coming from perceptual error buries variance related to the exogenous component. We can apply the same logic to subjective expectations about the electoral viability of a party and decompose them into an exogenous component— the party's vote share as reported in the polls — random noise, and systematic error (either driven by individual-level variables or systematic measurement bias). While poll shares have some error, it is the only source of information about the vote intentions of the electorate at large. During the campaign, polls on vote intentions are frequent and extensively covered by the media. Since polls are a unique source of information about the vote intentions of other voters that is easily accessible, a substantial share of voters should use them when forming expectations about the parties' electoral viability. In sum, due to the possibility of confounding when using subjective expectations to measure electoral viability and estimate its effect on vote choice, one should use the vote shares reported in the polls as a measure of electoral viability in order to make valid causal inference.[6]

Finally, the literature is silent on the possibility of a hybrid strategy. While Kedar's theory (2005; 2005; 2009) could also explain votes for major parties, it is most likely to apply to minor parties with policies situated closer to the extremes of issue dimensions (Kedar, 2009, p.27). By their nature, extreme parties can only garner limited support and thus are often at risk of falling beneath the electoral threshold. Theoretically, the motivation to cast a compensatory vote could be strongest in this context, since the vote is pivotal. The theory is also agnostic with regard to the voter's coalition preferences, but given the greater influence of governing parties on policy, compensatory voters should target potential coalitions. Under these two conditions, the compensatory and coalition insurance strategies would coincide to produce a hybrid strategy. Despite the many non-exclusive motivations for casting a strategic vote, the literature reviewed here does not test for the presence of alternative strategic motives that could explain the same outcome nor does it investigate the possibility of hybrid strategies[7].

While this body of literature holds important evidence of voters using compensatory and coalition insurance strategies in multiparty democracies, methodological shortcomings prevent a conclusive test of these theories. The main contribution of the present study is three-

[6] In fact, when the model used for the present analysis includes individual-level subjective expectations, it yields opposite estimates than when including poll shares instead (even though subjective expectations track the poll shares in the aggregate).

[7] The theory in Fredén (2021) does imply a hybrid strategy, however it is not acknowledged as such

fold: 1) it takes into account the role of the campaign in strategic voting; 2) it uses exogenous variables to measure the parties' electoral viability and policy position-taking; 3) it includes a hybrid strategy that combines different, but complementary, motivations for strategic voting. By testing for the presence of an exclusive causal mechanism of compensatory voting— the influence of policy information on the vote decision—the model used in this analysis can isolate compensatory voting strategies from pure coalition insurance voting. Moreover, by using exogenous measures of two of the main independent variables, it removes the bias caused by individual-level confounders and systematic survey measurement error. Finally, the present study explicitly addresses the possibility of hybrid strategies.

3 Theory and Hypotheses

3.1 Theory

Theoretically, strategic voting is defined as the opposite of "sincere" voting and refers to selecting a party that is different than one's first preference based on expectations about electoral outcomes. Empirically, the operationalization of this concept has been plagued by concerns about the validity of measurement. In fact, sincere voter preferences are particularly elusive. For this reason, I follow other scholars (Alvarez & Nagler, 2000; Blais et al., 2001; Johnston & Vowles, 2006; Lanoue & Bowler, 1998) who use an operational definition of strategic voting in which the influence of expectations about electoral outcomes on the vote decision is a sufficient condition for qualifying it as strategic.[8] This is a valid measurement of the concept because under sincere voting, the electoral viability of a party should not matter.

Depending on the motivations of the voters, there could be three different strategies that influence the decision to vote for a minor party in a multiparty system: a coalition insurance strategy, a pure compensatory strategy, and a hybrid compensatory/coalition insurance strategy. The motivations that drive these strategies include preference for an off-center coalition[9], electoral viability, and policy ambiguity. These strategies and how their corresponding motivations interact are illustrated in Section 3.2 along with examples.

In the pure coalition insurance strategy, both electoral viability and coalition preferences matter, as the voter is targeting a specific coalition. The probability of voting for a minor partner in an off-center coalition increases as preference for the coalition increases and the party's vote share in the polls decreases (and moves closer to the electoral threshold). Recall, the coalition insurance voter seeks to ensure that their preferred party leads the governing coalition by voting for a minor partner at risk of falling below the electoral threshold.

In my theory of a pure compensatory strategy, the three motivational factors come into play. The voter targets a coalition that brings policy outcomes closer to their ideal point. Left-leaning

[8] Blais et al. (2005) find that models of strategic voting based strictly on expectations about party viability and models that also include voters' reported preferences converge on the same outcome.

[9] In theory, coalition preference could be endogenous to vote intention. Yet, even if sincere vote intentions were driving coalition preferences for some voters, the effect of coalition preference on the probability of voting for a minor partner would not be conditional on poll shares if there were no strategic voting.

and right-leaning voters thus target off-center coalitions in order to avoid a grand coalition between the two centrist parties, which would produce policy outcomes that are too centrist. As the campaign progresses, the parties' policy agenda and the potential coalitions define themselves. Compared to party manifestos, voters are more exposed to campaign communication because of intense media coverage and its more concise format. Moreover, the constraints of the media format as well as competition for the voters' attention forces parties to emphasize their issue priorities. Campaigns thus put in focus contrasts between parties on issues and the policy bargains they are ready to make with potential coalitions partners. Consequently, the clarity or ambiguity of policy signals from minor partners should matter in the vote decision if the voter is policy-driven and not, instead, following a coalition insurance strategy. By specifying means to achieve a goal, clear policy statements allow voters to assess *how far* a party is ready to go to address the issue. In contrast, ambiguous policy statements only indicate a direction on an issue without any specific policy. By making clear policy statements, potential minor coalition partners signal to the voters that they are committed to defend certain policies in negotiations with major parties and to pull the coalition away from the center. In sum, clear policy signals should activate the compensatory strategy. Finally, the probability of casting a compensatory vote increases as the party's vote share in the polls increases, since greater electoral strength translate into greater power in the government, notably through the allocation of portfolios.

In the hybrid compensatory/coalition insurance strategy, the voter still targets a coalition that will bring policy outcomes closer to their ideal point, thus coalition preferences and policy signals influence their vote in the same way than under pure compensatory voting. However, the probability of voting for a minor party increases as the party's vote share in the polls *decreases* and moves closer to the threshold. This is because the voter seeks to "save" a coalition partner at risk of failing to get representation in the parliament. Under this theory, the utility of voting for a party is highest when the vote is pivotal, that is, when it could decide whether the party gets representation in the parliament. In fact, the marginal returns are huge for the second vote in German federal elections: it can determine if the party gets 0 seat or 30 seats.[10]

3.2 Hypotheses

Based on the theory of strategic voting for minor parties outlined above, I test a hypothesis for each strategy and for sincere voting. The hypotheses are formulated as to highlight the joint variable effects that increase the likelihood of voting for the minor partner.

Pure coalition insurance hypothesis:

H1. As off-center coalition preference increases and the minor partner's poll share decreases toward the threshold, the higher the likelihood of a vote intention for it.

[10]This is a crude minimum estimate based on the 5% threshold and the basic total number of seats (598), which can increase with overhang seats. The distribution of the seats does not either match perfectly the national share because seats are distributed on the basis of state lists. It also assumes that the party has not won any seat in the first vote, which is not far from reality (Die Gruenen and the FDP either got 0 or 1 seat based on the first vote in every election after the German reunification).

Pure compensatory strategy hypothesis:

H2. As off-center coalition preference increases, the minor partner's poll share *increases* away from the threshold, and its policy ambiguity decreases, the higher the likelihood of a vote intention for it.

Hybrid compensatory/coalition insurance strategy hypothesis:

H3. As off-center coalition preference increases, the minor partner's poll share *decreases* toward the threshold, and its policy ambiguity decreases, the higher the likelihood of a vote intention for it.

No strategy (sincere voting) hypothesis:

H4. Coalition preference and poll shares have no effect on the likelihood of a vote intention for a minor party.

The joint hypothesized variable effects for each strategy are illustrated in Figure 1 to 3. However, the effect of the poll share variable is not represented over its full range. For the strategies featuring a coalition insurance motive, beyond a certain point, variation in poll shares should not have any effect on the vote. That is, when the poll shares of a party are high enough to be safe, there should be no incentive to use a coalition insurance strategy. There is no theoretical reason to expect a fixed "safety" threshold, hence its value will be determined empirically. However, we can expect the relationship between poll shares and the probability of voting for a minor partner in the data under a pure coalition insurance strategy or hybrid strategy to follow a decreasing exponential decay function culminating just before the electoral threshold (first panel in Figure 4), as the minimum poll share in the data is 4 % (FDP 2013). For the pure compensatory strategy, poll shares should have a positive effect on the probability of voting for the minor partner, and then plateau when the minor partner is strong enough to have significant influence on policy outcomes, but not too strong as to dominate the major partner. Hence we can expect the relationship between poll shares and the probability of voting for a minor partner under a pure compensatory strategy to follow an increasing exponential decay function truncated at the electoral threshold (second panel in Figure 4).

To make the differences between the compensatory, coalition insurance and hybrid compensatory/coalition insurance strategies more concrete, let's compare two hypothetical situations using the case under study, Germany. In both situations, the poll share of Die Gruenen— a minor left-wing party —is at the electoral threshold, only varying the ambiguity of policy signals. Voter A and Voter B are both center-left voters and their first preference is the SPD, a major center-left party, but their objectives differ. Voter A wants to get the SPD to lead the government coalition, whereas the objective of voter B is to pull the policy outcomes of the coalition closer to their preferred policies. While voter A would not mind a grand coalition where power is shared with the CDU/CSU, the major center-right alternative, they prefer a left-wing coalition because it would give the SPD more power. Voter B, in contrast, prefers a left-wing coalition because its policy outcomes would be closer to their preferred policies than the policy outcomes of a grand coalition, which would be too centrist. To simplify, voter A wants their preferred party to win a bigger trophy, whereas voter B is policy-driven.

Figure 1: Pure Coalition Insurance Strategy: Hypothesized Effects of Strategic Voting Variables

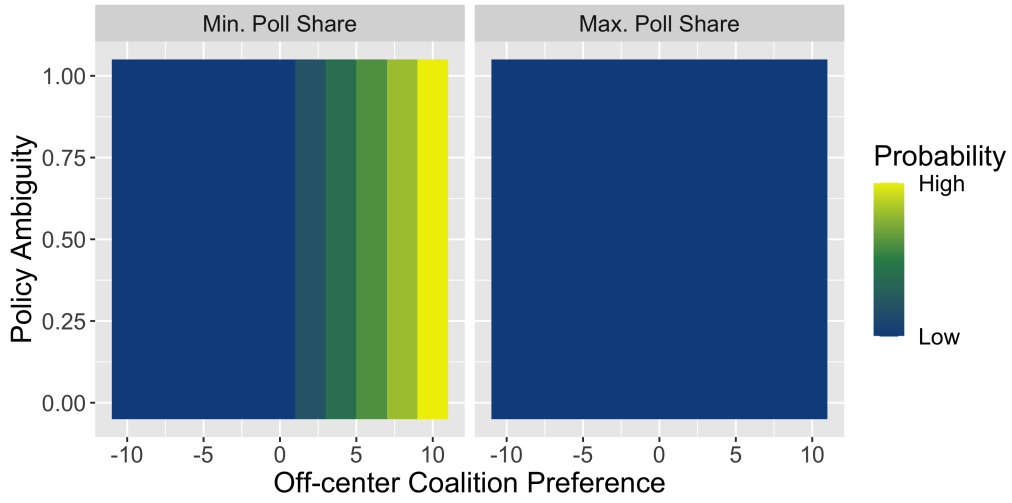


Figure 2: Pure Compensatory Strategy: Hypothesized Effects of Strategic Voting Variables

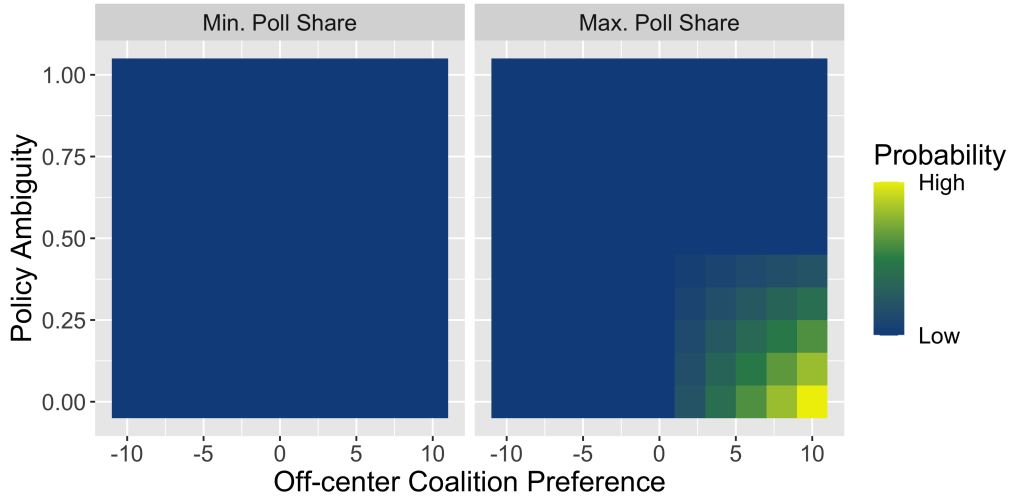
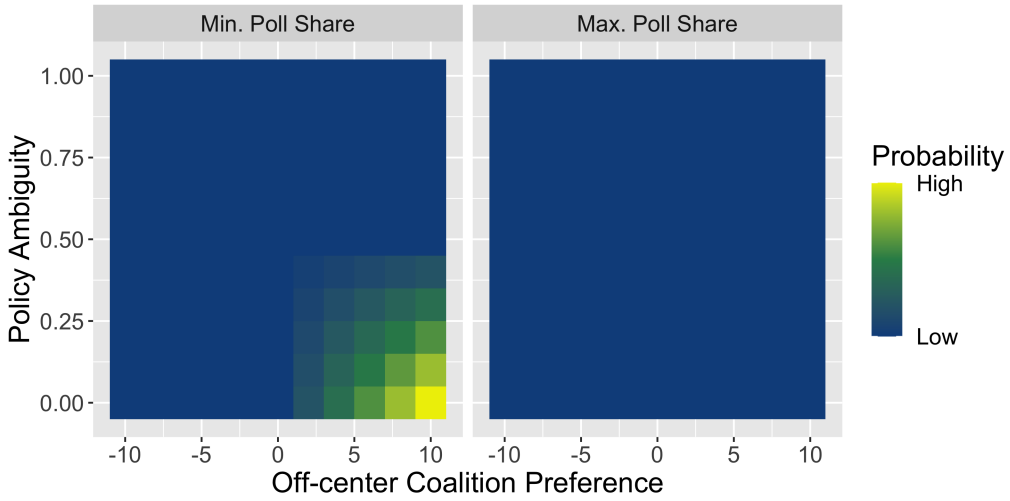


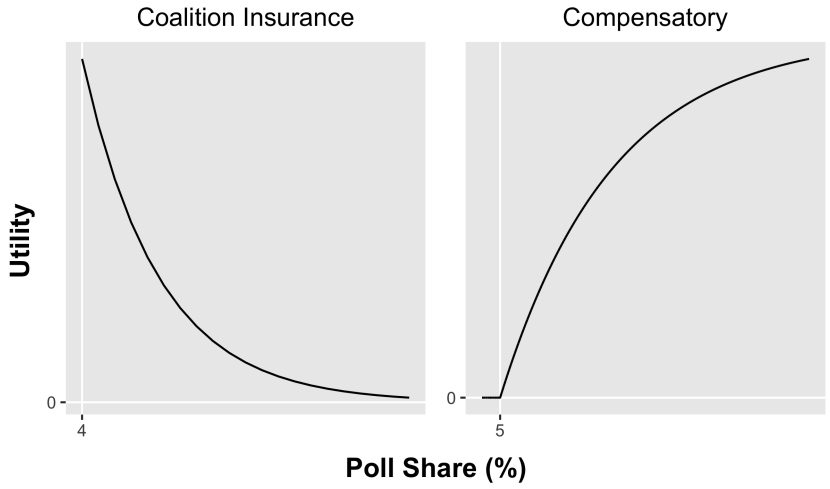
Figure 3: Hybrid Strategy: Hypothesized Effects of Strategic Voting Variables



In the first situation, Die Gruenen sends ambiguous policy signals. In this situation, voter B has no incentive to cast a compensatory vote for Die Gruenen since its policy agenda in government is unclear. Voter A, in contrast, has an incentive to use a coalition insurance strategy and vote for Die Gruenen to "save it" from falling below the electoral threshold, which would make a left-wing coalition led by the SPD impossible.

In the second situation, Die Gruenen sends clear policy signals. Depending on voter B's utility function over poll shares, they will vote for Die Gruenen or not. If their utility function is decreasing, they will use a compensatory/coalition insurance strategy and vote for Die Gruenen (see first panel in Figure 4). If their utility function is increasing, they will *not* vote for Die Gruenen as there is no incentive for a pure compensatory strategy (see second panel in Figure 4). Recall, casting a pivotal vote is a motivation attached to the coalition insurance strategy, whereas in a pure compensatory strategy the voter seeks to avoid wasting their vote. We can think of the difference between the utility functions at the electoral threshold for a coalition insurance strategy and a pure compensatory strategy as psychological. Under a coalition insurance strategy, the voter is optimistic; they believe that their vote will change the fate of the party. Under a pure compensatory strategy, the voter is pessimistic; they accept that the party is beyond rescue. Voter A, as before, will use a pure coalition insurance strategy and vote for Die Gruenen.

Figure 4: Utility Function of Poll Shares: Coalition Insurance and Compensatory Strategies



4 Empirical Strategy

To test these hypotheses, I use campaign-period survey data from the German Longitudinal Election Study (GLES) for the 2013 and 2017 federal elections in Germany as well as an original dataset of tweets about policy issues posted during the electoral campaign. This survey has a rolling cross-section design, which means that the day on which a respondent is interviewed is chosen randomly. My dependent variable is the second (list) vote intention. I use intentions for the second vote because its results are used to determine which parties pass the 5% electoral threshold and can get seats in the Bundestag. Since the vote share of minor parties tend to be too small to get seats under majority rule in the first vote at the constituency level, this electoral threshold is crucial for obtaining representation.[11] Given that they reach the threshold, minor parties get a number of seats that is proportional to their second vote share. Hence compensatory voters should use their second vote to support a minor coalition partner.

To measure the electoral viability of minor parties, I use their vote shares in the polls published during the campaign.[12] I average poll shares by day and lag it by one day, to allow reception of the information. For days with no poll, I use the poll share average for the last day where polls were published. This is consistent with the logic that only the most recent poll information should be relevant for voter decision-making. Based on the theoretical assumption that the utility of a strategic vote for a minor partner conditional on poll shares follows an exponential decay function, I transform the variable using the binary logarithm.

To measure coalition preference, I take the difference between the ratings for the targeted

[11] This does not concern regional minor parties, who can get representation if they win at least three seats in the first vote.

[12] This includes the polls from Allensbach, Emnid, Forsa, Forschungsgruppe Wahlen, GMS, Infratest Dimap, INSA, Trend Research, YouGov and Institut für marktforschung Leipzig.

coalition and the grand coalition.[13] This measure allows a more precise measurement of preference for off-center coalitions because it discriminates between voters who like a grand coalition and an off-center coalition equally and voters who prefer an off-center coalition. My model controls for party ratings in order to account for their correlation with coalition ratings. The variable included in the model is the difference between the ratings of the minor partner and the major partner in the given off-center coalition. The model also includes various demographic variables, time, and party identification as controls. Controlling for time entails that the effect of poll shares is modelled as the effect of deviations from the time trends visible in Figure 5.

To measure the ambiguity of the parties' policy signals, I use their issue statements on Twitter, which has the advantage of being unbiased by second-hand reports. Campaign statements are also more representative of the parties' policy priorities than policy manifestos, which have a broader scope and whose static nature cannot reflect strategic dynamics during the campaign. De Nooy and Kleinnijenhuis (2013) shows that issue agreement in campaign tweets predicts support and attacks among parties, thus that issue statements during the campaign are part of a coalition-building strategy. Twitter is also a good proxy for the information available to the voters in the general media environment, as conventional media often report and comment on campaign tweets (Parmelee, 2013). Electoral candidates also use Twitter as a tool to communicate their policy priorities to the media, in a similar fashion to a press release (Casero-Ripollés et al., 2016; De Sio et al., 2018; Kreiss, 2016; Stier et al., 2018). In fact, the issues covered in social media and conventional media are correlated, as both react to the events of the day and feed from each other (Casero-Ripollés et al., 2016; Conway et al., 2015; Neuman et al., 2014; Posegga & Jungherr, 2019). In short, Twitter is a reliable source to get the policy positions of candidates and a good proxy for the general media environment surrounding electoral campaigns.

The Twitter data contains statements from party leaders (or, when unavailable, the party's official account) on four major issues during each electoral campaign: in 2013, inequality, European integration, education and the economy; in 2017, inequality, immigration, education and the environment. These issues were selected on the basis of issue importance among voters and issue salience in the media during the campaign.[14] Each tweet is coded as either a clear policy statement, or as ambiguous if there is only a direction (e.g. for or against climate action) but no specific policy. Tweets that contained a link to another media in which the candidate made clear policy statements are coded as clear. The *policy ambiguity* variable used in the models is the proportion of ambiguous policy statements for each party the day before the interview.

[13] In the GLES, the rating scales, or "scalometers" range from -5 (not desirable at all) and +5 (very desirable).

[14] In 2013, the selected issues are the top four most important issues for the respondents in the GLES survey. In 2017, the selected issues are among the top five most important issues (domestic security is #4, but was not selected due to its valence and consequent lack of meaningful directional positions). In terms of media coverage, in 2017, inequality ("welfare" in that data), immigration and the environment are the top three issues covered in the two newspapers (Bild and Sueddeutsche Zeitung) that are included in the PolDem-National Election Campaign Dataset (Kriesi et al., 2020). These issues are also in the top five of the issues that were tweeted by political parties according to Ceron et al. (2020). In 2013, the economy ("economic liberalism" in that data) and inequality ("welfare" in that data) are the top two issues in the PolDem-National Election Campaign Dataset. European integration is in sixth position. For both years, education is not a top issue in the media, however, I included it due to its importance for the voters.

An important assumption that my operationalization of compensatory voting makes is that minor parties have more extreme policies than major parties. This should be true on average, because major parties' success depends on catering to the "median" voter, which is located at the center of issue dimensions (assuming a normal distribution). In the cases at hand, the major partners are the SPD, a center-left social democratic party, and the CDU/CSU, a center-right political alliance. They form a centrist "grand coalition" that has governed following the 2005, 2013 and 2017 elections. The coalitions that are likely to be targeted under compensatory voting are a left-wing coalition between the SPD, Die Linke ("The Left") and/or Die Gruenen ("The Greens"), and a right-wing coalition between the CDU/CSU and the FDP (liberals). In fact, voters are more likely to expect a left-wing coalition between the three left-wing parties due to the low seat share of the SPD in the elections of the last two decades.[15] Figure 10 in section 8.1 of the appendix shows that the left-wing and right-wing coalitions are in fact further from the center than the grand coalition, based on data from the Chapel Hill Expert Survey. By voting for a left-wing coalition, compensatory voters aim to push the governing coalition toward more progressive policies than under a grand coalition between the two centrist parties. By voting for a right-wing coalition, compensatory voters aim to push the governing coalition toward more conservative policies and economic liberalism than under a grand coalition.

The hypotheses are tested as follows. First, to test the the pure compensatory and compensatory/coalition insurance hypotheses, I run a multinomial logistic regression of second vote intentions for minor partners that includes a three-way interaction between preference for the off-center coalition, the poll share of the minor partner and its policy ambiguity. To make the test meaningful, the reference category on the outcome is the major party in the off-center coalition. Valid evidence must show that voters are more or less likely to choose a minor partner instead of the leading party as a result of the interaction effect. I consider a statistically significant interaction effect at standard levels and a predicted probability plot that shows the variable effects in Figure 2 or 3 as evidence in favour of the hypothesis. To test the pure coalition insurance hypothesis, I use the estimates from the same multinomial logistic regression and test whether the probability of a second vote intention for the minor party increases as its poll share decreases at maximum off-center coalition preference. If there is a statistically significant effect at standard levels, I use a predicted probability plot to check that it is independent from the effect of policy ambiguity. If all these tests are unsuccessful, the absence of strategic voting— the sincere voting hypothesis —is retained.

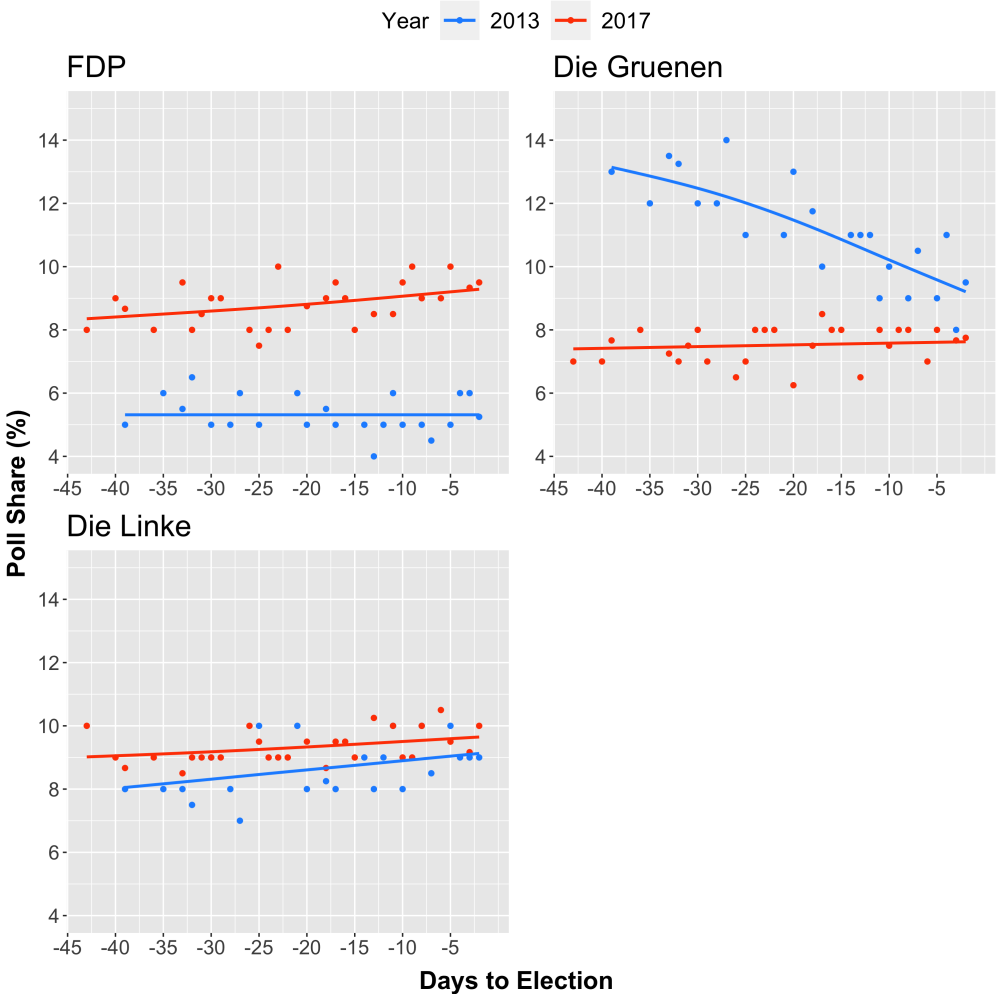
5 Polling Trends in the 2013 and 2017 German Federal Elections

When assessing the electoral viability of a minor party, voters should not only consider its poll share on a given day, but also the general trend over the campaign. The present study does not have enough cases to test between-campaign hypotheses, hence theoretical expectations regarding polling trends are treated as scope conditions. A downward trend in poll shares should activate a coalition insurance strategy because it suggests that the party is at risk of not passing the electoral threshold on election day. By the same token, if the vote share of a party

[15] As a matter of fact, the 2017 GLES does not even include a two-party left-wing coalition as an option. In 2013, the GLES only included a coalition between the SPD and Die Gruenen.

is trending upward, it should reduce the incentives to cast a coalition insurance vote because it suggests that the party is safely moving away from the threshold. In contrast, a downward trend in poll shares should be a disincentive for a pure compensatory strategy, since it suggests that the party is at risk of failing to get representation in the parliament and won't carry much clout in policy-making, if any. An upward trend in polls should activate a pure compensatory strategy because the party is gaining power, which is translated into influence on policy outcomes once in the parliament. Figure 5 shows the poll trends in vote intentions for German minor parties over the campaign by election.

Figure 5: Poll Trends in Vote Intentions for Minor Parties over the Campaign



Note: The smoother used for the lines is a general additive model (GAM) with natural cubic splines.

In general, vote shares are trending upward, which is favourable to compensatory vot-

ing. There are two exceptions: the FDP in 2013 and Die Gruenen in 2013. The poll shares of Die Gruenen in 2013 are trending downward, which should be a disincentive for a pure compensatory strategy and an incentive for a pure coalition insurance strategy or a compensatory/coalition insurance strategy. The poll shares of the FDP in 2013 are stable and hovering around the electoral threshold (5%). In theory, this should be an incentive for strategies involving coalition insurance voting, as the party is not moving away from the electoral threshold thus is at risk of failing to get seats in the Bundestag. Note also that overall, the poll shares of Die Gruenen are higher than the FDP in 2013, meaning that the party is relatively safer. Hence we should expect the level of coalition insurance voting for Die Gruenen to be lower.

6 Results

6.1 Pure Compensatory and Compensatory/Coalition Insurance Strategies

This section presents the results of the tests of the pure compensatory and compensatory/coalition insurance hypotheses for the cases that yielded conclusive evidence. The results for the other cases are presented in the appendix.

6.1.1 2013 German Federal Election

There is evidence of compensatory/coalition insurance voting targeting both a left-wing coalition and a right-wing coalition in 2013. Starting with compensatory/coalition insurance voting targeting a right-wing coalition, the three-way interaction effect on the probability of a second vote intention for the FDP relative to the CDU/CSU in Table 1 is statistically significant at an alpha level of .01. Figure 6 shows the variable effects hypothesized for the compensatory/coalition insurance strategy. The probability of a second vote intention for the FDP increases as policy ambiguity decreases at high levels of right-wing coalition preference when the FDP's poll share is at its lowest (4%), but not when it is at its highest (6.5%). At a predicted probability slightly above 50 %, the FDP is the most likely vote choice among the strongest supporters of a right-wing coalition when its poll share is below the electoral threshold and when its policy signals are clear. When the FDP's poll share is at its highest, overall the probability of a second vote intention for the FDP is low, even among voters who prefer a right-wing coalition to a grand coalition (voters with positive scores on the right-wing coalition preference variable).

Table 1: Multinomial Logistic Regression of 2013 Second Vote Intention for FDP

	Dependent Variable: FDP v. CDU/CSU
Preference for Right-wing Coalition	2.694***
	(0.719)
Policy Ambiguity	1.232
	(3.550)
Coalition Preference × Policy Ambiguity	-2.797**
	(1.011)
Poll Share	0.555
	(1.032)
Coalition Preference × Poll Share	-1.055***
	(0.285)
Policy Ambiguity × Poll Share	-0.596
	(1.369)
Coalition Preference × Policy Ambiguity × Poll Share	1.203**
	(0.403)
Constant	-0.645
	(2.355)
Observations	562

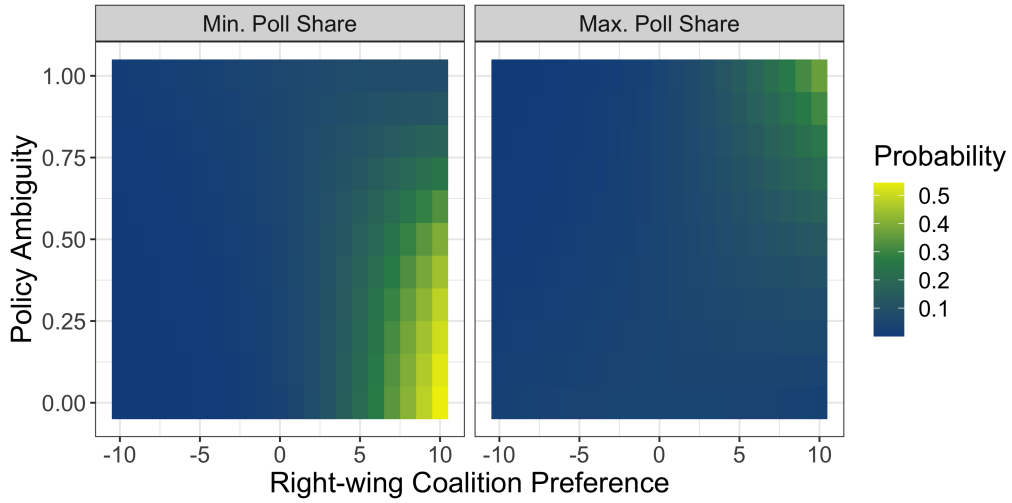
Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of FDP, party identification

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

Figure 6: Probability of Second Vote intention for FDP by by Poll Share, Coalition Preference and Policy Ambiguity (2013)



There is also evidence of compensatory/coalition insurance voting targeting a left-wing coalition with a vote for Die Gruenen.[16] The three-way interaction identifying compensatory/ coalition insurance voting in Table 2 is statistically significant at an alpha level of .001. Figure 7 shows the same pattern than for the FDP vote. The probability of a second vote intention for Die Gruenen increases as its policy ambiguity decreases when its poll share is at its minimum (8%) for voters with positive scores on the left-wing coalition preference variable. There is no such relationship when the poll share of Die Gruenen is at its maximum (14%). In other words, voters who prefer a left-wing coalition to a grand coalition are more likely to vote for Die Gruenen when it is at risk of falling below the electoral threshold and when it sends clear policy signals. As expected, the effect of policy ambiguity is weaker for Die Gruenen than for the FDP. At minimum poll share, the probability of a second vote intention for Die Gruenen increases by 34 percentage points over the range of policy ambiguity, compared to an increase of 46 percentage points for the FDP.

[16]Note that the independent variables identifying compensatory voting for Die Linke and Die Gruenen were included in separate models because of the reduction in sample size when included in the same model due to the high number of missing values on the policy ambiguity variable for Die Linke. The results for Die Linke are reported in Section 8.2.2.1 of the appendix.

Table 2: Multinomial Logistic Regression of 2013 Second Vote Intention for Die Gruenen

	Dependent Variable: Gruenen v. SPD
Preference for Left-wing Coalition	2.133**
	(0.741)
Policy Ambiguity	-9.083
	(5.372)
Coalition Preference × Policy Ambiguity	-3.026***
	(0.912)
Poll Share	-1.907
	(1.132)
Coalition Preference × Poll Share	-0.667**
	(0.230)
Policy Ambiguity × Poll Share	2.766
	(1.628)
Coalition Preference × Policy Ambiguity × Poll Share	0.918***
	(0.279)
Constant	4.097
	(4.312)
Observations	1744

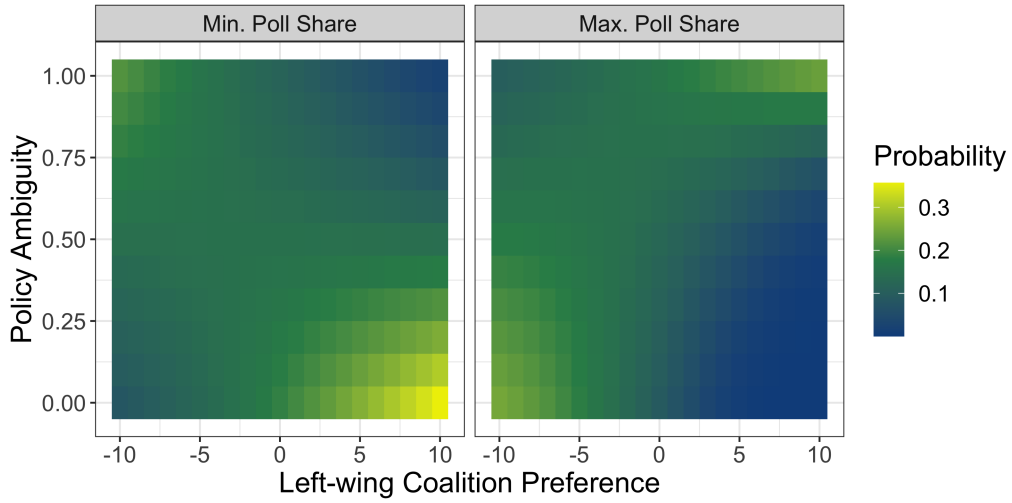
Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, party identification

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

Figure 7: Probability of Second Vote intention for Die Gruenen by Poll Share, Coalition Preference and Policy Ambiguity (2013)



To verify that these results are not driven by extrapolation— that is, combinations of values on some variables that are outside the range of the data[17] —I use accumulated local effects (ALE) as a robustness check. ALE are an unbiased alternative to PDP because they use the conditional distribution instead of the marginal distribution. I include ALE plots along with the models from which the predictions are derived in the appendix (Section 8.2.2.3 for Die Gruenen's vote and Section 8.2.1.2 for the FDP vote) because the estimation of ALE for three-way interactions is not currently supported on R. Hence I estimate models with a two-way interaction between coalition preference and policy ambiguity only for the subset of observations with low poll shares. Overall, the ALE plots show the same relationship between the variables of interest than the partial dependence plots and thus confirm the compensatory/coalition insurance voting hypothesis for Die Gruenen and the FDP in 2013.

6.1.2 2017 German Federal Election

There is evidence of pure compensatory voting targeting a left-wing coalition in 2017. The three-way interaction effect on the probability of a second vote intention for Die Gruenen relative to the SPD in Table 3 is statistically significant at a .05 alpha level.[18] Figure 8 shows that at its maximum poll share, the probability of a second vote intention for Die Gruenen increases when left-wing coalition preference increases and policy ambiguity decreases. The ALE plot in Figure 13 (Section 8.2.4.3 of the appendix) shows the same interaction effect. At its minimum poll share, there is no such relationship and the probability of a second vote intention for Die

[17] This would be most likely for coalition preference, which is substantially correlated with feelings toward parties and possibly demographic variables.

[18] Note that the independent variables identifying compensatory voting for Die Linke and Die Gruenen were included in the same model, but that only the estimates for Die Gruenen are reported here for the sake of clarity. The results for Die Linke are reported in Table 14.

Gruenen is low overall.

Table 3: Multinomial Logistic Regression of 2017 Second Vote Intention for Die Gruenen

	Dependent Variable: Gruenen v. SPD
Preference for Left-wing Coalition	-0.819
	(2.609)
Policy Ambiguity	14.884*
	(6.416)
Coalition Preference × Policy Ambiguity	3.538*
	(1.709)
Poll Share	4.465**
	(1.686)
Coalition Preference × Poll Share	1.071*
	(0.534)
Policy Ambiguity × Poll Share	-5.326*
	(2.269)
Coalition Preference × Policy Ambiguity × Poll Share	-1.233*
	(0.613)
Constant	-17.741
	(9.540)
Observations	2385

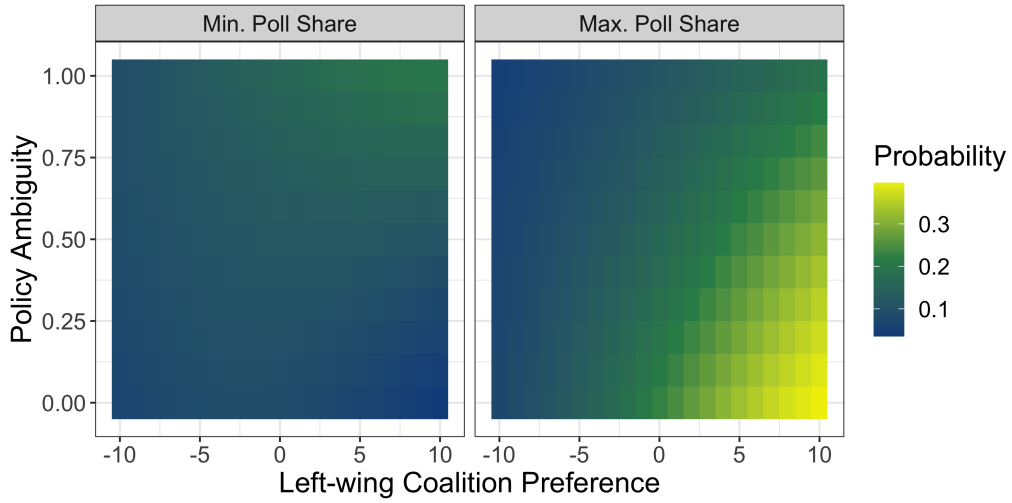
Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, rating of Die Linke, party identification

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

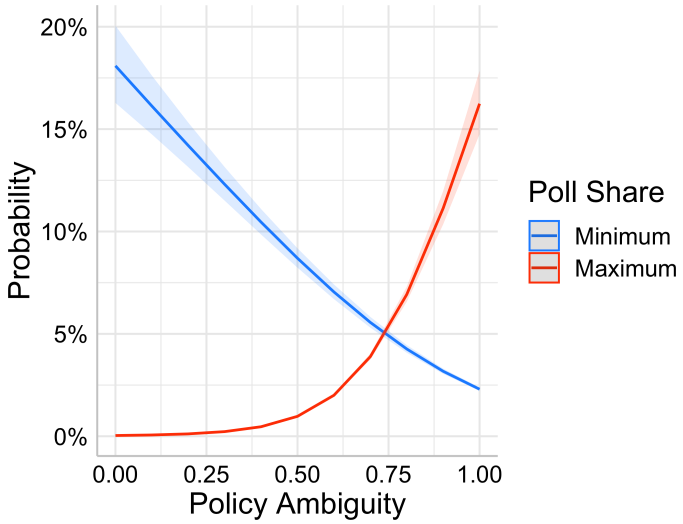
Figure 8: Probability of Second Vote intention for Die Gruenen by Poll Share, Coalition Preference and Policy Ambiguity (2017)



6.2 Pure Coalition Insurance Strategy

To test the pure coalition insurance hypothesis, I use the estimates from the same multinomial regression models than those used to test the hypotheses involving compensatory voting, and analyse the main effect of poll shares. To do so, I compute the chi-square statistic for the difference in the predicted probability of voting for the minor party at its minimum and maximum poll share, with the subset of voters who have the highest score on off-center coalition preference. In general, the contrasts of predicted probabilities for minimum versus maximum poll share are not statistically significant at standard levels and are often inconsistent with a coalition insurance strategy (see Section 8.3.2 in the appendix). The exception is Die Gruenen in 2013. The probability of a second vote intention for Die Gruenen when its poll share is at its minimum is 7 percentage point higher than when it is at its maximum, a contrast that is statistically significant at a 0.05 alpha level. However, this effect is driven by the interaction with policy ambiguity, as Figure 9 shows. If poll shares had a negative effect on the probability of a second vote intention for Die Gruenen that was independent from policy ambiguity, we would expect the curve for the minimum poll share to always be higher than the curve for maximum poll share over the range of policy ambiguity. That would mean that part of the effect of poll share could not be explained by policy ambiguity. In sum, there is no evidence of pure coalition insurance voting in any of the cases.

Figure 9: Predicted Probability of a Vote Intention for Die Gruenen by Policy Ambiguity and Poll Share at Maximum Coalition Preference (2013)



7 Discussion and Conclusion

This study makes an important contribution to the literature on coalition-directed strategic voting by accounting for the influence of campaign policy signals on the vote decision-making process. By taking into account an exclusive mechanism of compensatory voting, this study can disentangle the coalition insurance strategy from the compensatory strategy, which both result in a vote for a minor coalition partner with non-centrist policies. Coalition insurance voting aims at making one's preferred major party the formateur of the governing coalition, regardless of its policy outcomes. In contrast, compensatory voters aim at bringing the policies of the governing coalition closer to their ideal point. By showing that clear policy signals from minor coalition partners increase the probability of a strategic intention to vote for them, I provide evidence that voters are policy-driven, a necessary and exclusive mechanism of compensatory voting. Moreover, this study addresses the possibility of a hybrid strategy, namely compensatory/coalition insurance voting, among policy-driven voters who seek to save a minor partner at risk of falling beneath the electoral threshold. Another important contribution is the use of exogenous variables to measure the electoral viability and policy position-taking of minor parties, which strengthens causal inference.

There is evidence of strategic voting for minor parties in the 2013 and 2017 German federal elections. The results for the 2013 election indicate that compensatory/coalition insurance voting targeting both a left-wing coalition and a right-wing coalition took place. This is consistent with trends in polls across the campaign that show the vote share of Die Gruenen decline sharply and the vote share for the FDP staying close to the electoral threshold, signalling to the voters that these parties are at risk of failing to get representation in the Bundestag. Clear policy signals from Die Gruenen and the FDP when their poll shares were at their lowest ac-

tivated policy-driven voters who sought to save a partner in their preferred coalition. Another interesting finding is that the "safety" threshold, the poll share at which potential strategic voters decide that a coalition insurance voting strategy is not necessary, is different for the two cases (see Figure 14 in Section 8.4 of the appendix). If the probability of voting for Die Gruenen conditional on poll shares declined as sharply as for the FDP, we would not observe strategic voting for Die Gruenen. This suggests that strategic voters may not only consider the official electoral threshold, but also the vote share needed to form the governing coalition. In the cases at hand, the safety threshold may have been lower for the FDP than Die Gruenen because its major partner, the CDU/CSU, was stronger in the polls (with vote shares around 40%) than the SPD (around 25%). The hypothesis of no strategic voting is retained for Die Linke, although with the important caveat that the sample size may be too small to detect any effect. In 2013, both the FDP and Die Linke posted tweets about policy issues on only a quarter of the days, which substantially reduces the sample size for estimation.

The 2017 electoral campaign unfolded against a different background. In that election, the vote intention shares of all minor parties are trending upward and away from the electoral threshold, which signals to the voters that the parties are safe. Hence the fact that there is no support for the coalition insurance hypotheses (hybrid and pure) is not surprising. Instead, there is evidence of pure compensatory voting, which requires that the party gets seats in the Bundestag. The results show that clear policy signals from the minor partners in a left-wing coalition increased the probability of voting for them as coalition preference and poll share increased. The evidence for the effect of a pure compensatory strategy on the Gruenen vote is strong, whereas the evidence for the Linke vote is limited to high attention voters. On the latter, while the three-way interaction effect identifying compensatory voting is not statistically significant at standard levels, there is a statistically significant first difference in the probability of voting for Die Linke at maximum left-wing coalition preference and maximum poll share— values at which we would expect policy ambiguity to have an effect if there is compensatory voting —when its policy ambiguity is at its minimum versus its maximum (see Section 8.2.4 in the appendix). Yet, the second difference (comparing the effect of policy ambiguity across levels of poll share) is not statistically significant at standard levels. Hence the evidence of pure compensatory voting for Die Linke is inconclusive. Another interesting finding is that the plot of the effect of poll shares on the probability of voting for Die Gruenen among potential compensatory voters shows a function that is not yet plateauing (see Figure 14 in Section 8.4 of the appendix), suggesting that if the party were to poll higher than 8%, the probability of a compensatory vote could increase substantially. Finally, there is no evidence of compensatory voting targeting a right-wing coalition in 2017. This could be due to the more progressive policy positions of the CDU/CSU on inequality and immigration in that election, which undermined the prospects of an agreement with the FDP.

These findings have implications for how we understand the democratic process. First, voters do not exclusively rely on cognitive shortcuts, like the state of the economy or party labels, to make their vote decision. In this context, the campaign is decisive for policy-driven voters because it provides crucial information about the policies of the parties on major issues. Intense media scrutiny and heightened attention to politics among voters during the campaign allow them to gather information that they would not have been exposed to otherwise and use it to make a vote decision. Second, voters do take into account the policy outcomes of the govern-

ment by targeting specific coalitions. This addresses the debate in the rational voter literature based on the Downsian model of spatial voting about voters who choose another party than the one with the policy platform that is the closest to their ideal point. Rational voters who are policy-driven can choose a party that is far from their ideal point when it brings the policy agenda of the targeted coalition closer than alternative coalitions. The campaign, by delivering policy information, defines the target of potential strategic voters.

But does this matter in terms of electoral outcomes? None of the studies on coalition-directed voting reviewed here provide estimates of the proportion of strategic voters in their sample. To estimate the proportion of strategic voters, I compare the predictions made under a strategic voting model that includes all the party and leader rating variables along with demographic variables, and a nested sincere voting model that does not include the strategic voting variables. If the predicted vote intention is the same regardless of whether the strategic voting variables are taken into account, the voter is considered sincere. Put another way, their coalition preferences, the electoral viability of minor parties and their policy ambiguity do not matter for their vote decision. If the inclusion of the strategic variables leads to a different prediction, then the voter is considered strategic. The estimated share of strategic voters in 2013 is 1.7% for the FDP and 0.5 % for Die Gruenen. This suggests that had the FDP's share of strategic voters been only slightly higher (estimated as 0.2 percentage point), the FDP would have passed the electoral threshold and gotten representation in the 2013 election. In 2017, the share of strategic voters is 1% for Die Gruenen, and 0.9% for Die Linke. [19] These low proportions are not surprising given that even among the most likely strategic voters, the probability of voting for a minor coalition partner is relatively low. Yet, if minor parties sent clearer policy signals during campaigns, the proportion of strategic voters could grow. Moreover, higher polls shares during the campaign, when trending upward, could generate more compensatory voting. Still, in proportional electoral systems a 1% strategic voting share directly translates into seat gains (in the cases at hand, about 6 seats). The amount of strategic voting that is not explained by the strategies that are the focus of this analysis is also of interest (see Tables 20 to 22 in section 8.5 of the appendix). In total, 5% of the voters are estimated to be strategic on average, which is comparable to studies on plurality electoral systems (see Blais et al., 2001).

An interesting avenue for further research would be the analysis of campaign effects on compensatory voting in contexts where there is no formal governmental coalition, but where minority governments need support from other parties to govern. In a situation where the front-runner does not have enough support to form a majority government, non-centrist voters could target an informal coalition by voting for a minor party that is likely to negotiate and cooperate with the major centrist party in power, thus bringing policy outcomes away from the center and closer to their ideal point. Another avenue would be to look at the between-campaign effect of polling trends on vote intentions in a large-N study, as they could be more influential than within-campaign variation in polls.

[19] Note, however, that the strategic voting models are substantially more accurate. The proportional reduction in error (PRE) of the strategic voting models compared to their sincere counterpart when predicting vote intentions for the given minor parties ranges from 3.5% (Die Gruenen in 2017) to 23.8% (FDP in 2013).

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8 Appendix

8.1 Policy Extremity of Potential Coalitions

The Chapel Hill Expert Survey (CHES), although it does not pertain to the specific policies of the parties during a given electoral campaign, can shed light on their general extremity at a certain point in time. The survey asks expert how strongly each party holds a certain directional position (e.g. favour or oppose) on diverse issues on a numerical scale. I used the 2014 wave because it includes most of the issues that are part of my analysis. The only issue that is not included in the CHES is education.[20] To get the average position of the German parties, I re-scaled these variables to a -1 to 1 scale and took the average score for each party. Negative scores represent policy positions associated with the Left and positive scores, with the Right. Scores closer to 0 indicate a more centrist position, and scores closer to -1 or 1 indicate a more extremist position.[21]

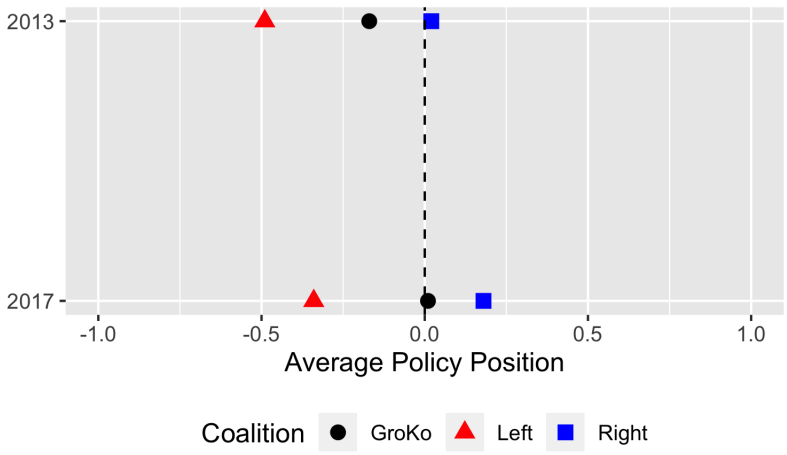
To get an idea of how voters perceived the average position of potential coalitions on the most important issues of the campaign, rough estimates were obtained by averaging over the average issue scores of the parties included in each coalition, weighted by their seat share after the given election.[22] While the seat share outcomes of the election is an imprecise proxy for the seat shares that voters would attribute based on information that they got during the campaign— from polls for instance —it is sufficient for the purpose of checking descriptive assumptions. Figure 10 shows the average policy positions of a grand coalition ("GroKo"), a left-wing coalition, and a right-wing coalition. In both election, the grand coalition occupies the middle position, and the left-wing and right-wing coalitions are further from the center. Hence non-centrist policy-driven voters should use a compensatory strategy and target off-center coalitions, although the proportion who do will vary depending on the relative position of the coalitions in a given election and the distribution of voters on the issues at hand.

[20] The names of the variables in the CHES 2014 dataset are: redistribution, eu_ep, econ_interven, immigrate_policy and environment.

[21] For the 2013 election issues, the major parties got an average score that is closer to 0 (CDU = -0.03, CSU = 0.12, SPD = -0.43) than minor parties overall (FDP = 0.24, Gruenen = -0.48, Linke = -0.67). For the 2017 election issues, major parties also tend to be closer to the center than minor parties (CDU = 0.13, CSU = 0.35, SPD = -0.24, FDP = 0.19, Gruenen = -0.55, Linke = -0.35).

[22] Hübscher (2019) has demonstrated that weighting policy scores by electoral strength is the best predictor of the policies of the governing coalitions in Germany. For 2013, since the FDP did not get any seat, I attribute it 5 percent of the seats (the minimum possible) and subtract 1 point to the seat shares of each of the five parties who got representation.

Figure 10: Average Policy Positions of Potential Coalitions



8.2 Test of Compensatory strategies

In this section, I present the results of the multinomial regression models of left-oriented and right-oriented compensatory voting in the 2013 and 2017 German federal election campaign that were not included in the main part of the analysis. Note that there is an important caveat in interpreting the results related to statistical power for the 2013 election. In that election, the FDP and Linke only posted tweets about the issues included in the study on a quarter of the days, which considerably reduces the sample size available for the analysis.

8.2.1 2013: Right-oriented Compensatory Voting Model

8.2.1.1 Attentive Voters

Table 4 shows the results of the multinomial regression for the subset of voters who are attentive to politics. Convergence was not achieved most likely because of data sparsity for the outcome category "AfD". However, the estimates for the FDP seem reasonable. The three-way interaction effect identifying compensatory voting is not statistically significant.

8.2.1.2 Regression Estimates of Second Vote Intention for FDP Used to Compute ALE

Table 5 presents the results of the multinomial regression models used to estimate ALE. Figure 11 shows the ALE of the interaction between coalition preference and policy ambiguity on the probability of a second vote intention for Die Gruenen when its poll share is low (under the mean log-transformed poll share). It shows the same relationship between the variables of interest than the partial dependence plots: as coalition preference increases and policy ambiguity decreases, the probability of a second vote intention for Die Gruenen increases.

Table 4: High Attention Voters: Regression of 2013 Second Vote Intention for FDP

	Dependent Variable: FDP v. CDU/CSU
Preference for Right-wing Coalition	2.258*
	(1.140)
Policy Ambiguity	-12.930
	(10.759)
Coalition Preference × Policy Ambiguity	-0.592
	(1.947)
Poll Share	-0.019
	(1.307)
Coalition Preference × Poll Share	-0.836
	(0.463)
Policy Ambiguity × Poll Share	4.570
	(4.197)
Coalition Preference × Policy Ambiguity × Poll Share	0.318
	(0.788)
Constant	6.846
	(5.001)
Observations	386

No convergence

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of FDP, party identification

Table 5: Low Poll Shares: Regression of 2013 Second Vote Intention for FDP

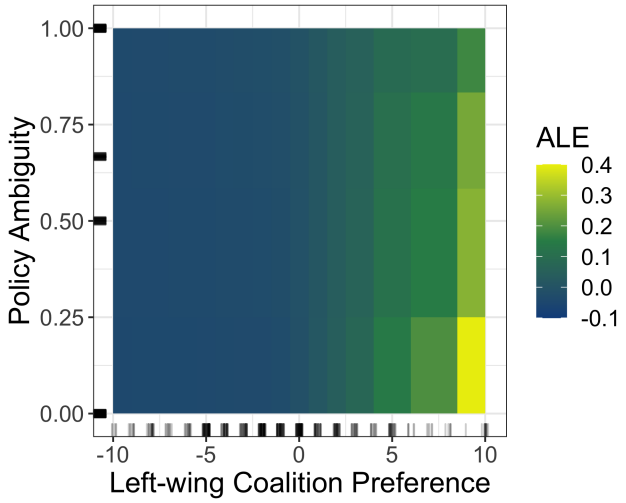
	Dependent Variable: FDP v. CDU/CSU
Preference for Right-wing Coalition	6.269*
	(3.024)
Policy Ambiguity	-0.204
	(0.570)
Coalition Preference × Policy Ambiguity	0.154
	(0.237)
Poll Share	-2.767
	(5.291)
Coalition Preference × Poll Share	-2.645
	(1.392)
Constant	-3.360
	(13.083)
Observations	419

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of FDP, party identification

Figure 11: Total ALE of Interaction between Coalition Preference and Policy Ambiguity on Second Vote Intentions for FDP (2013)



8.2.2 2013: Left-oriented Compensatory Voting Model

8.2.2.1 Regression of Second Vote Intention for Die Linke

In this section, I test the compensatory and compensatory/coalition insurance strategies for the Die Linke vote. Note that the independent variables identifying compensatory voting for Die Linke and Die Gruenen were included in separate models because of the high number of missing values on the policy ambiguity variable for Die Linke due to the party not posting tweets on 3/4 of the days. The three-way interaction in Table 6 is not statistically significant at standard levels. To test whether there is an interaction effect at substantially significant values of the predictors, I estimate and compare the first differences in the average predictive margins at minimum and maximum values of policy ambiguity over the minimum and maximum values of poll shares, when coalition preference is at its maximum. Table 7 shows that at minimum poll share, the effect of policy ambiguity is negative, and at maximum poll share, the effect is positive. These effects could be consistent with coalition insurance voting. However, these effects are not statistically significant at standard levels according to a hypothesis test for first differences.

Table 6: Multinomial Logistic Regression of 2013 Second Vote Intention for Die Linke

	Dependent Variable: Linke v. SPD
Preference for Left-wing Coalition	-4.013
	(3.938)
Policy Ambiguity	6.222
	(16.531)
Coalition Preference × ambig_p_Linke	2.953
	(4.087)
Poll Share	1.265
	(6.188)
Coalition Preference × Poll Share	1.413
	(1.342)
Policy Ambiguity× Poll Share	-2.051
	(5.564)
Coalition Preference × Policy Ambiguity× Poll Share	-1.045
	(1.345)
Constant	-6.974
	(17.665)
Observations	530

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Linke, party identification

Table 7: Predicted Probability of voting for Die Linke at High Level of Left-wing Coalition Preference in 2013

Policy Ambiguity	Probability (SE)	95% CI
Min. Poll Share		
Minimum Ambiguity	0.308*	[0.051,0.565]
	(0.131)	
Maximum Ambiguity	0.263	[-0.154,0.681]
	(0.213)	
Max. Poll Share		
Minimum Ambiguity	0.298	[-0.715,1.310]
	(0.517)	
Maximum Ambiguity	0.394***	[0.189,0.598]
	(0.104)	
N	25	

Subset: left-wing coalition preference > 5. Left-wing coalition preference was not set at the maximum level due to the small sample size.
Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

8.2.2.2 Attentive Voters

The interaction identifying the compensatory voting strategies may only have an effect among voters who are attentive to politics. Table 8 shows a statistically significant three-way interaction effect on the probability of a second vote intention for Die Gruenen. Table 9 shows a non-statistically significant three-way interaction effect on the probability of a second vote intention for Die Linke relative to the SPD.

8.2.2.3 Regression Estimates of Second Vote Intention for Die Gruenen Used to Compute ALE

Table 10 presents the results of the multinomial regression models used to estimate ALE. Figure 12 shows the ALE of the interaction between coalition preference and policy ambiguity on the probability of a second vote intention for Die Gruenen when its poll share is low (under the median log-transformed poll share). It shows the same relationship between the variables of interest than the partial dependence plots: as coalition preference increases and policy ambiguity decreases, the probability of a second vote intention for Die Gruenen increases.

Table 8: High Attention Voters: Regression of 2013 Second Vote Intention for Die Gruenen

	Dependent Variable: Gruenen v. SPD
Preference for Left-wing Coalition	2.454**
	(0.763)
Policy Ambiguity	-9.212
	(6.407)
Coalition Preference × Policy Ambiguity	-3.659***
	(0.918)
Poll Share	-1.797
	(1.293)
Coalition Preference × Poll Share	-0.766***
	(0.232)
Policy Ambiguity × Poll Share	2.789
	(1.932)
Coalition Preference × Policy Ambiguity × Poll Share	1.096***
	(0.277)
Constant	2.620
	(5.255)
Observations	1268

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, party identification

Table 9: High Attention Voters: Regression of 2013 Second Vote Intention for Die Linke

	Dependent Variable: Linke v. SPD
Preference for Left-wing Coalition	-2.570
	(1.600)
Policy Ambiguity	-50.167***
	(10.499)
Coalition Preference × ambig_p_Linke	-1.248
	(2.502)
Poll Share	-15.959***
	(4.281)
Coalition Preference × Poll Share	0.959
	(0.568)
Policy Ambiguity× Poll Share	16.568***
	(3.546)
Coalition Preference × Policy Ambiguity× Poll Share	0.322
	(0.756)
Constant	48.320***
	(14.550)
Observations	406

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Linke

Table 10: Low Poll Shares: Regression of 2013 Second Vote Intention for Die Gruenen

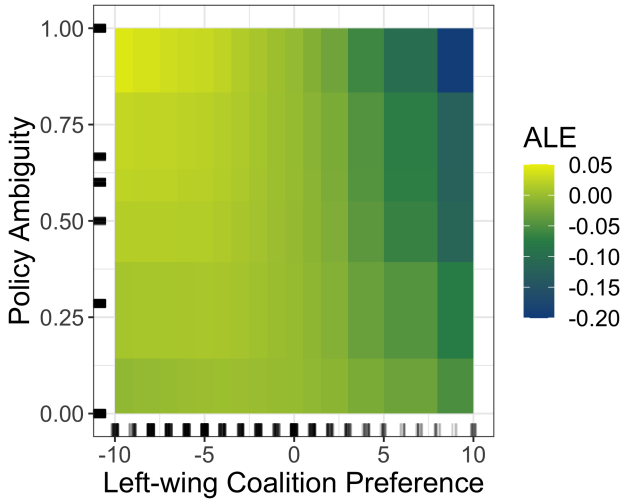
	Dependent Variable: Gruenen v. SPD
Preference for Left-wing Coalition	2.624**
	(0.843)
Policy Ambiguity	-1.745
	(6.079)
Coalition Preference × Policy Ambiguity	-3.352**
	(1.135)
Poll Share	-2.874**
	(1.056)
Coalition Preference × Poll Share	-0.821**
	(0.262)
Policy Ambiguity × Poll Share	0.554
	(1.838)
Coalition Preference × Policy Ambiguity × Poll Share	1.023**
	(0.350)
Constant	7.993*
	(3.338)
Observations	1316

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, party identification

Figure 12: Total ALE of Interaction between Coalition Preference and Policy Ambiguity on Second Vote Intentions for Die Gruenen (2013)



8.2.3 2017: Right-oriented Compensatory Voting Model

8.2.3.1 Full sample

In this section, I present the results of the multinomial regression model of compensatory voting targeting a right-wing coalition with data for the 2017 German federal election. In Table 11, the absence of a statistically significant three-way interaction between coalition preference, policy ambiguity and uncertainty about viability suggests that there was no right-oriented compensatory voting in 2017. To test whether there is an interaction effect at substantially significant values of the predictors, I estimate and compare the first differences in the average predictive margins at minimum and maximum values of policy ambiguity over the minimum and maximum values of poll shares, when coalition preference is at its maximum. Table 12 shows that the probability of a second vote intention for FDP actually increases with policy ambiguity, which is not consistent with compensatory voting. However, the first differences for the effect of policy ambiguity are not statistically significant at standard levels at either level of poll share.

8.2.3.2 Attentive Voters

The interaction identifying the compensatory voting strategies may only have an effect among voters who are attentive to politics. The three-way interaction effect in Table 13 is almost null and not statistically significant at standard levels.

Table 11: Multinomial Logistic Regression of 2017 Second Vote Intention for FDP

	Dependent Variable: FDP v. CDU/CSU
Preference for Right-wing Coalition	-0.163
	(0.770)
Policy Ambiguity	2.000
	(3.688)
Coalition × Ambiguity	-0.084
	(0.994)
Poll Share	0.076
	(0.308)
Coalition × Poll	0.032
	(0.087)
Ambiguity × Poll	-0.221
	(0.420)
Coalition × Ambiguity × Poll	0.013
	(0.114)
Constant	-2.303
	(2.714)
Observations	1797

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of FDP

Table 12: Predicted Probability of voting for FDP at High level of Right-Wing Coalition Preference in 2017

Policy Ambiguity	Probability (SE)	95% CI
Min. Poll Share		
Minimum Ambiguity	0.244	[-0.012,0.500]
	(0.131)	
Maximum Ambiguity	0.300*	[0.048,0.551]
	(0.128)	
Max. Poll Share		
Minimum Ambiguity	0.307	[-0.080,0.693]
	(0.197)	
Maximum Ambiguity	0.439**	[0.164,0.713]
	(0.140)	
N	52	

Subset: right-wing coalition preference = 10

Standard errors in parentheses

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

8.2.4 2017: Left-oriented Compensatory Voting Model

8.2.4.1 Regression of Second Vote Intention for Die Linke

Table 14 presents the results of the regression of second vote intention for Die Linke. The independent variables identifying compensatory voting for Die Linke and Die Gruenen were included in the same model.

8.2.4.2 Attentive Voters

The three-way interaction effect identifying compensatory voting for Die Gruenen and Die Linke in Table 15 are not statistically significant at standard levels. To test whether there is an interaction effect on the probability of voting for Die Linke at substantially significant values of the predictors, I estimate and compare the first differences in the average predictive margins at minimum and maximum values of policy ambiguity over the minimum and maximum values of poll shares, when coalition preference is at its maximum. Then, I test the statistical significance of the second difference, i.e. the difference in the effect of policy ambiguity at minimum and maximum poll share.

The predictive margins in Table 16 show a compensatory voting relationship among attentive voters who have a maximum score on left-wing coalition preference, as policy ambiguity has a large negative effect on the probability of a second vote intention for the party when Die Linke's vote share is at its maximum. The first difference in the predicted probability of voting for Die Linke when its poll share is at its highest at minimum versus maximum policy ambiguity is statistically significant at a .05 alpha level. When its poll share is at its lowest, the first

Table 13: High Attention Voters: Regression of 2017 Second Vote Intention for FDP

	Dependent Variable: FDP V. CDU/CSU
Preference for Right-wing Coalition	-0.227
	(0.843)
Policy Ambiguity	2.262
	(3.239)
Coalition × Ambiguity	0.068
	(1.092)
Poll Share	0.081
	(0.254)
Coalition × Poll	0.037
	(0.096)
Ambiguity × Poll	-0.242
	(0.373)
Coalition × Ambiguity × Poll	-0.002
	(0.125)
Constant	-2.583
	(2.353)
Observations	1347

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of FDP

Table 14: Multinomial Logistic Regression of 2017 Second Vote Intention for Die Linke

	Dependent Variable: Linke v. SPD	
Preference for Left-wing Coalition	-0.819	-2.379
	(2.609)	(2.484)
Policy Ambiguity	5.311	-18.402
	(9.134)	(12.969)
Coalition Preference × ambig_p_Linke	-1.564	0.004
	(2.000)	(2.375)
Poll Share	0.918	-2.265
	(2.222)	(4.088)
Coalition Preference × Poll Share	-0.693	0.029
	(0.539)	(0.602)
Policy Ambiguity× Poll Share	-1.694	5.824
	(2.818)	(4.097)
Coalition Preference × Policy Ambiguity× Poll Share	0.505	-0.007
	(0.620)	(0.739)
Constant	-17.741	-2.880
	(9.540)	(16.002)
Observations	2385	

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, rating of Die Linke, party identification

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

difference is not statistically significant at standard levels. In other words, policy ambiguity does not have any effect on the probability of a second vote intention for Die Linke when its poll share is closest to the threshold. However, the null for the second difference cannot be rejected at standard alpha levels (p-value = 0.34), hence there is not sufficient evidence to support the hypothesis of compensatory voting.

Table 15: High Attention Voters: Regression of 2017 Second Vote Intention for Die Gruenen and Die Linke

	Dependent Variable:	
	Gruenen v. SPD	Linke v. SPD
Preference for Left-wing Coalition	0.025	-3.504
	(3.047)	(3.083)
Policy Ambiguity	-1.595	-18.447
	(6.799)	(22.164)
Coalition Preference × Policy Ambiguity	2.685	1.769
	(2.279)	(2.765)
Poll Share	0.816	-3.363
	(1.811)	(6.999)
Coalition Preference × Poll Share	1.007	0.477
	(0.734)	(0.649)
Policy Ambiguity × Poll Share	0.525	5.787
	(2.413)	(7.003)
Coalition Preference × Policy Ambiguity × Poll Share	-0.930	-0.593
	(0.812)	(0.859)
Constant	-7.129	10.287
	(10.707)	(26.265)
Observations	1813	1813

Converged

Robust standard errors in parentheses (clustered by day)

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, rating of Die Linke, party identification

8.2.4.3 Regression Estimates of Second Vote Intention for Die Gruenen Used to Compute ALE

Table 17 presents the results of the multinomial regression models used to estimate ALE. Figure 17 shows the ALE of the interaction between coalition preference and policy ambiguity on the probability of a second vote intention for Die Gruenen when its poll share is high (above the median log-transformed poll share). It shows the same relationship between the variables of interest than the partial dependence plots: as coalition preference increases and policy ambiguity decreases, the probability of a second vote intention for Die Gruenen increases.

Table 16: High Attention Voters: Predicted Probability of voting for Die Linke at High Level of Left-wing Coalition Preference in 2017

Policy Ambiguity	Probability (SE)	95% CI
Min. Poll Share		
Minimum Ambiguity	0.444***	[0.304,0.584]
	(0.071)	
Maximum Ambiguity	0.402***	[0.303,0.500]
	(0.050)	
Max. Poll Share		
Minimum Ambiguity	0.613***	[0.469,0.757]
	(0.073)	
Maximum Ambiguity	0.415***	[0.316,0.513]
	(0.050)	
N	28	

Subset: left-wing coalition preference = 10

Standard errors in parentheses

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

Table 17: High Poll Shares: Regression of 2017 Second Vote Intention for Die Gruenen

	Dependent Variable: Gruenen v. SPD
Preference for Left-wing Coalition	0.090
	(0.096)
Policy Ambiguity	-0.654
	(0.534)
Coalition Preference $\times$ Policy Ambiguity	-0.120
	(0.119)
Constant	-1.575
	(0.843)
Observations	1656

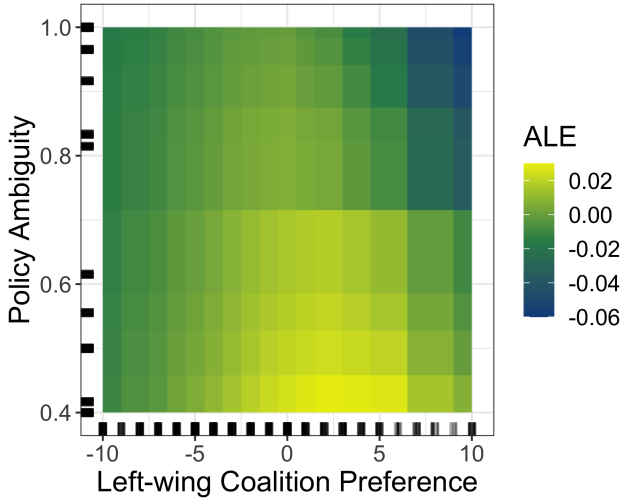
No convergence

Robust standard errors in parentheses

Controls: days, West, religious, age, union member, catholic, female, single, completed college rating of Die Gruenen, party identification

Figure 13 shows the ALE of the interaction between coalition preference and policy ambiguity on the probability of a second vote intention for Die Gruenen when its poll share is at its maximum. Note that there is no value under 0.4 for the policy ambiguity variable at maximum poll share. Yet, the ALE plot shows a similar relationship between the variables of interest than the partial dependence plots: as coalition preference increases and policy ambiguity decreases, the probability of a second vote intention for Die Gruenen increases.

Figure 13: Total ALE of Interaction between Coalition Preference and Policy Ambiguity on Second Vote Intentions for Die Gruenen (2017)



8.3 Test of Pure Coalition Insurance Strategy

8.3.1 Descriptive Summary of Poll Shares

Table 18 shows the minimum and maximum poll shares by minor party for each year, which can be used as a reference when reading Table 19.

Table 18: Minimum and Maximum Poll Shares (%) by Minor Party

Party	Min. Poll Share	Max. Poll Share
	2013	
FDP	4	6.5
Die Gruenen	8	14
Die Linke	7	10
	2017	
FDP	7.5	10
Die Gruenen	6.25	8.5
Die Linke	8.5	10.5

8.3.2 Hypothesis test

Table 19 shows the predicted probabilities of voting for each minor party in each election at maximum off-center coalition preference for minimum and maximum poll share, along with the p-value for the hypothesis test of the contrast. If there were coalition insurance voting, we would expect that the probability of a second vote intention for the party increases as its poll share decreases among voters who strongly prefer an off-center coalition to a grand coalition. In general, the contrasts in poll shares are not consistent with a coalition insurance strategy and are not statistically significant at standard levels, except for Die Gruenen in 2013.

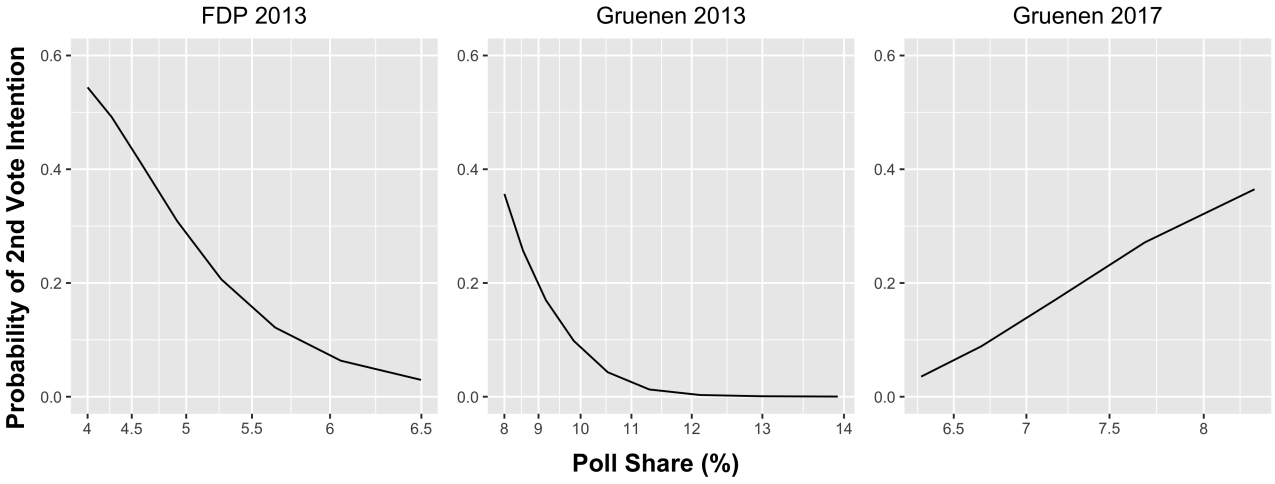
Table 19: Predicted Probability (%) of Voting for Minor Party at High Off-Center Coalition Preference by Poll Share Value

Party	Min. Poll Share	Max. Poll Share	Contrast p-value
	2013		
FDP	32	22	0.29
Die Gruenen	16	11	0.04
Die Linke	33	30	0.91
	2017		
FDP	28	41	0.50
Die Gruenen	7	13	0.22
Die Linke	44	50	0.44

8.4 Relationship between Poll Shares and Probability of Voting for Minor Partner

Figure 14 shows the probability of voting for a minor partner over poll shares at maximum coalition preference and minimum policy ambiguity, averaging over covariates. The scale of the log-transformed poll share variable was back-transformed to facilitate the interpretation of the results. The plots for the FDP and Die Gruenen in 2013 show the decreasing exponential decay function theorized for compensatory/coalition insurance voting (Figure 4). The plot for Die Gruenen in 2017 shows a relationship that is almost linear, probably due to the fact that poll shares are too low to show the function plateauing.

Figure 14: Effect of Log-transformed Poll Shares on the Probability of Voting for Minor Partner at Maximum Coalition Preference and Minimum Policy Ambiguity



8.5 Sincere Voting v. Strategic Voting

Table 20: 2013: Contingency Table of Predicted Second Vote Intentions under Right-wing Hybrid Strategic Voting Model and Sincere Voting Model (Row Percentages)

	Sincere Predicted Vote					
Strategic Predicted Vote	CDU/CSU	SPD	FDP	AfD	Gruenen	Linke
CDU/CSU	96.47	0.88	12.50	0.00	0.00	0.00
SPD	1.76	95.58	0.00	0.00	2.08	3.12
FDP	1.76	1.77	87.50	0.00	2.08	0.00
AfD	0.00	0.00	0.00	100.00	0.00	0.00
GRUENE	0.00	1.77	0.00	0.00	91.67	0.00
LINKE	0.00	0.00	0.00	0.00	4.17	96.88

** Sincere Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, ratings of each party, ratings of each leader, party identification

* Strategic Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, rating ratings of each party, ratings of each leader, party identification, coalition preference, policy ambiguity of FDP, poll share of FDP

Table 21: 2013: Contingency Table of Predicted Second Vote Intentions under Left-wing Hybrid Strategic Voting Model and Sincere Voting Model (Row Percentages)

	Sincere Predicted Vote					
Strategic Predicted Vote	CDU/CSU	SPD	FDP	AfD	Gruenen	Linke
CDU/CSU	97.88	2.03	0.00	0.00	1.94	3.57
SPD	0.88	95.18	0.00	2.44	0.00	2.38
FDP	0.35	0.25	100.00	0.00	0.00	0.00
AfD	0.53	0.25	0.00	92.68	1.94	2.38
GRUENE	0.35	0.51	0.00	4.88	94.84	1.19
LINKE	0.00	1.78	0.00	0.00	1.29	90.48

** Sincere Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, ratings of each party, ratings of each leader, party identification

* Strategic Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, rating ratings of each party, ratings of each leader, party identification, coalition preference, policy ambiguity of Die Gruenen, poll share of Die Gruenen

Table 22: 2017: Contingency Table of Predicted Second Vote Intentions under Left-wing Compensatory Strategic Voting Model and Sincere Voting Model (Row Percentages)

	Sincere Predicted Vote**					
Strategic Predicted Vote*	CDU/CSU	SPD	FDP	AfD	Gruenen	Linke
CDU/CSU	96.47	1.56	1.39	3.70	2.41	1.35
SPD	0.49	95.32	1.39	0.00	0.00	2.70
AfD	0.49	0.39	93.06	0.00	0.40	0.00
FDP	1.09	0.00	2.78	95.68	0.00	0.90
GRUENE	1.09	1.17	0.00	0.00	95.18	2.70
LINKE	0.36	1.56	1.39	0.62	2.01	92.34

** Sincere Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, ratings of each party, ratings of each leader, party identification

* Strategic Voting Model Variables: days, West, religious, age, union member, catholic, female, single, completed college, rating ratings of each party, ratings of each leader, party identification, coalition preference, policy ambiguity of Die Gruenen, policy ambiguity of Die Linke, poll share of Die Gruenen poll share of Die Linke