Encouraging Loyalty and Defection:

The Impact of Campaigns on Tactical Voting in Britain

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Abstract

I study the impact of party campaigns on tactical voting, focusing on voters with tactical incentives. Focusing on three UK Elections, I exploit panel data within each election to address endogeneity in party behavior, which would otherwise bias the estimates of campaign effects. My findings show that party contacts during campaigns have an influence in encouraging loyalty to preferred non-viable parties and defection to alternative viable ones. These findings are important as relatively little is known about what influences voters' decision to cast tactical votes, beyond their demographic characteristics and the electoral circumstances they may find themselves in.

Keywords: tactical voting; strategic voting; voting behavior; panel data

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1 Introduction

Electoral systems are susceptible to tactical (strategic) behavior, understood as a vote not reflecting an individual's sincere preference ranking (Gibbard, 1978; Cox, 1997).[1] The incentive to cast a non-sincere vote is strongest in winner-take-all systems for voters whose preferred candidate is unlikely to win. Tactical voting has received widespread attention in the voting behavior literature. This attention is warranted, as it plays a central role in understanding how voters respond to the incentives created by electoral systems and rules, ultimately shaping electoral outcomes (Duverger, 1954; Cox, 1997). A substantial empirical literature has focused on measuring the extent of tactical voting. Evidence from a variety of electoral systems shows that around 15 to 40 percent of voters who are in a position to cast a tactical vote, that is, voters whose most preferred party is non-viable, actually do so (see Alvarez et al., 2018, for a review). This can be consequential for overall election outcomes: Kiewiet (2013), for example, finds that as many as one in five Labour seats in Westminster are won thanks to tactical votes by individuals who would prefer a Liberal Democrat instead.

The literature has focused less on why some voters behave tactically while others do not, partly due to the challenges in measuring the extent of tactical voting. While many important correlates of tactical voting have been found (see Section 2), they typically relate to electoral circumstances or voters' demographics. Importantly, these correlates are generally non-actionable: they are not factors over which electoral participants have any agency, at least during a campaign. This means that our understanding of tactical voting remains limited by a mostly passive view of how parties and voters relate to tactical voting behavior.[2]

To complement the extant literature, I focus on the impact that being contacted by political parties during a campaign has on voters' propensity to vote tactically. Direct outreach to voters is a clear actionable factor, as parties have agency over their campaigning decisions. Other actionable factors include various forms of advertising, major speeches and events, which are

[1] *I use 'tactical' for voter behavior, and reserve 'strategic' for parties' actions.*

[2] *For some exceptions, see Fisher (2001); Fieldhouse et al. (2013).*

not the focus of this article. In the UK context, there is evidence that parties include references to the tactical situation in their constituencies when contacting voters,[3] suggesting their actions are partly motivated by tactical voting behavior. News reports show that parties and candidates in other countries also refer to instrumental motivations as part of their campaign strategies.[4]

A central challenge in estimating the effect of party contacts on tactical voting is that party contacts are likely endogenous, with parties strategically preferring to approach voters who are easier to reach or who may be more likely to respond to their appeals. This strategic targeting, while imperfect, introduces a confounding factor. Ideally, the strategic behavior of parties could be addressed using field experiments, in the spirit of Gerber et al. (2008). However, while an intervention aimed at turnout may be relatively uncontroversial, one aimed at altering voters' choices can face ethical dilemmas (Beerbohm et al., 2020), and does not allow for the study of past elections.

Instead, I rely on observational data and exploit the panel structure of the British Election Study (BES) Online Panel (Fieldhouse et al., 2020), with data from the 2015, 2017, and 2019 elections. The focus on the UK is due to the availability of high-quality survey data with a panel structure, key to the identification strategy. I use data from three survey waves per election. The analysis focuses on voters with an incentive to cast a tactical vote, based on the measure from Eggers and Vivyan (2020). I address the endogeneity challenge by a combination of two main factors. First, when estimating the effect of party contacts on tactical voting, I control for voters' pre-election vote intention. This helps account for the possibility that parties contact voters already predisposed to vote in the way the party prefers. Second, I control for a measure of predicted probabilities of contact for the election wave, which control for parties' being more likely to contact certain voters. To obtain these predicted probabilities, I use data from two pre-

[3] *About 22% of leaflets collected by https://www.openelections.co.uk mention the tactical situation.*

[4] *Challengers during the Argentine Presidential Election argue about 'useful' versus 'conviction' votes (AP, 2015). During the Brazilian Presidential Election, Lula encouraged 'useful votes' in his favor (Couto and Roxo, 2022), a move criticized by third party supporters (de Oliveira, 2022).*

election waves to estimate models in which the outcome is whether a voter is contacted by each party. Then, I calculate the probability that a voter will be contacted during the election wave. The estimation model also controls for voters' preferences directly, which allows to measure changes in behavior not generated by changes in preferences.

Overall, around one third of voters in recent UK elections are in a position to vote tactically. My findings show that party contacts have a significant impact on tactical voting, by encouraging defection from a Most Preferred party or loyalty to it. Specifically, the contact efforts by voters' Most Preferred party lead to a reduction of 2.3 percentage points in tactical voting, while the contact efforts by voters' Best Alternative party increase tactical voting by 2.9 percentage points. Considering the impact of all parties simultaneously, I find that party contacts are responsible for about a 2 percentage points increase in tactical voting. Some of this higher tactical voting is the result of a reduction in abstentions, but the dominant proportion comes from a switch of sincere votes to tactical ones.

It is important to note that the findings in this paper are different, but complementary, to the broader UK campaigns literature on persuasion. While persuasion is understood as a change in voters' preferences leading to a change in behavior, the effects described here measure a change in voting behavior separate from any changes in preferences that may simultaneously occur. The results also stand in contrast to those in the persuasion literature in the United States, which typically finds null or minimal effects (e.g., Kalla and Broockman, 2018), especially for Presidential campaigns. Important differences in setting, however, can help explain the difference in findings. The US two-party system has few cross-pressured voters and virtually no voters face tactical incentives; whereas the UK multiparty system has many more cross-pressured voters with many facing strong tactical incentives.

The rest of the article is organized as follows: Section 2, discusses the literature on tactical voting and campaign effects, and presents the hypotheses; Section 3, describes the data and methodology; Section 4 presents the main results and partial counterfactual exercises; Section 5 concludes.

2 Related Literature and Hypotheses

There is a rich literature that measures tactical voting behavior in a variety of electoral systems.[5] This literature focuses predominantly on the measurement of tactical voting, but there is less understanding on why some voters cast tactical votes while others, facing the same circumstances, do not. The variables that the literature has identified as associated with tactical voting can be grouped in two categories: voter characteristics, and the electoral environment.

Among voter characteristics, voters with strong partisan or ideological attachments are significantly less likely to cast a tactical vote (Lanoue and Bowler, 1992; Niemi et al., 1992; Fisher, 2001; Blais, 2002; Karp et al., 2002). There is evidence that political sophistication and knowledge (sometimes proxied by education) are positively associated with tactical voting (Niemi et al., 1992; Fisher, 2001; Karp et al., 2002; Alvarez et al., 2006; Gschwend and van der Kolk, 2006; Merolla and Stephenson, 2007; Eggers et al., 2022), as is political interest (Fisher, 2001).[6] Higher socio-economic status is also positively related to tactical voting (Eggers and Vivyan, 2020; Eggers et al., 2022). There is also evidence that when voters are experienced with the electoral system they are more likely to vote tactically (Duch and Palmer, 2002; Spenkuch, 2018); and so are voters that believe the media influences the voting decisions of others (Cohen and Tsfati, 2009).

Among the electoral environment variables, theory emphasizes the closeness of the election (Cox, 1997). When the race between the top-two contenders is close, third party supporters should be more likely to vote tactically, as a defection from their most preferred party is more likely to be pivotal. Empirical results support this expectation, albeit weakly (Lanoue and Bowler, 1992; Fisher, 2000; Kiewiet, 2013; Elff, 2014; Núñez, 2016).[7] Relatedly, the 'distance

[5] *Heath and Evans (1994); Fieldhouse et al. (1996); Alvarez and Nagler (2000); Duch and Palmer (2002); Karp et al. (2002); Alvarez et al. (2006); Gschwend and van der Kolk (2006); Fieldhouse et al. (2007); Kiewiet (2013); Kawai and Watanabe (2013); Elff (2014); Spenkuch (2018)*

[6] *An exception is Eggers and Vivyan (2020), who find no differences in tactical voting by education level.*

[7] *Some authors find null effects (Niemi et al., 1992).*

from contention' of the most preferred party, has been shown to be positively associated with tactical behavior (e.g., Niemi et al., 1992). The empirical literature has also found that the presence of a viable close ideological substitute to a non-viable preferred party encourages tactical voting (Karp et al., 2002), and that the presence of an incumbent politician interferes with the decision to cast a tactical vote (Moser and Scheiner, 2005).

The correlates identified in the literature do not provide with actionable recommendations, as electoral participants (parties, volunteers, voters) typically have no agency over these variables during a campaign. But there are a variety of actions parties can take during a campaign: candidate speeches and events, TV adverts, as well as contacting voters directly. There are also decisions that parties can make *prior* to the campaign that can influence tactical behavior. An important one is elite coordination in the decision to field candidates, such as the Unite to Remain pact in 2019. While national-level campaign behavior and pre-campaign elite coordination can influence tactical behavior, this article focuses on direct outreach by parties.

There is a rich literature that studies campaign effectiveness across the world. Experimental evidence from multiple countries has shown that citizens are responsive to get-out-the-vote efforts (Gerber et al., 2008; John and Brannan, 2008; Arceneaux and Nickerson, 2009; Fieldhouse et al., 2013; Townsley, 2018). In terms of persuasion, there is an extensive literature on campaign effects in the US, which typically finds null (e.g., Kalla and Broockman, 2018) or minimal persuasion effects (see Brady et al., 2006, for a review), or effects that otherwise decay over time (e.g., Hill et al., 2013). Research in the US also finds that persuasion is more likely or stronger in non-partisan elections (e.g., primaries) and lower-information elections (Kalla and Broockman, 2018; Sides et al., 2022). More recently, Broockman and Kalla (2022) find that during the 2020 Presidential Election, voters were more persuadable with information about candidates they knew less, influencing both candidate evaluations and vote choice (including defection). Several hypotheses about the null/minimal campaign effects in the US have been proposed: campaigns do not provide information voters' do not already have, (2) partisan cues are very strong, (3) polarization and partisanship means few "cross-pressured" voters susceptible

to persuasion, (4) campaigns' ability to increase the salience of favorable issues is limited by competing framing.

Studies in other countries, typically using observational data, tend to find persuasion effects of campaigns (Geys, 2006; Karp et al., 2008). Within the UK context, there is a substantial literature that studies the effects of local campaigning, generally finding that parties benefit from more organized and intense local campaigns, both in terms of mobilization and persuasion (Whiteley and Seyd, 1994; Pattie and Johnston, 2003; Clarke et al., 2004, 2009; Fisher et al., 2016, 2011, 2019; Johnston et al., 2013; Cutts, 2014; Fieldhouse et al., 2020; Núñez, 2021). It is likely that the difference in findings between the US and UK are due to different contexts.[8] The US is a highly polarized two-party system. The UK, on the other hand, is a multiparty system. While polarization between the two largest parties is only slightly lower than in the US (Boxell et al., 2022), the presence of third parties means more "cross-pressured" voters susceptible to persuasion. In fact, the UK literature tends to find that conversion/persuasion between the top two parties is either null/minimal (Núñez, 2021), or smaller than between a top-two and a third party (Johnston et al., 2013); with the lion's share of campaign effects occurring between a top and a third party.

The the literature on campaign effects, however, has not focused on whether party campaigns can incite tactical or expressive motivations in voters, separate and distinct from the traditional persuasion/conversion operating through changes in voter preferences. There are two exceptions. Fisher (2001) finds some correlational evidence at the constituency level that campaign spending by the favourite and second favorite parties influence tactical voting. Fieldhouse et al. (2013) argue that not only voters behave tactically, but parties may also act strategically by focusing their election campaigns on 'marginal seats.' They find some evidence that parties' strategic spending is associated with more tactical voting, inferred from flow-of-the-vote (aggregate) analyses.

[8] *Differences may also come from methodology. An important portion of the US literature uses experiments, less common in the UK. It is possible that not all observational studies sufficiently address endogeneity.*

Notwithstanding these two exceptions, our understanding of how campaigns affect tactical voting is limited. This article contributes to both these strands literature by measuring the effect of direct outreach on the set of voters with an incentive to vote tactically, by focusing on evidence at the voter-level. Understanding the behavior of these voters is key to understanding incentives in electoral systems, all of which are, to some extent, susceptible to tactical behavior. But studying voters with an incentive to behave tactically is also important because the motivations behind their behavior may be distinct. These voters may be susceptible to persuasion (a change in preferences) like any other voter, which the general campaign literature addresses. But party outreach may also trigger or reinforce tactical and expressive motivations, beyond changes in preferences, which has not been studied. In fact, parties in the UK oftentimes highlight the strategic situation in a constituency with this in mind: out of over 8,000 campaign leaflets collected and classified by Open Elections as of December 2022, approximately 22% include a mention of the strategic situation in the constituency.[9]

Before discussing the hypotheses, it is useful to provide a few definitions. A voter's Most Preferred Party is the party from which a voter derives the highest utility if elected. A voter has a tactical incentive to deviate from their Most Preferred party if a vote for some other party gives them a higher expected utility. The party from which a voter derives the highest expected utility (other than their most preferred) is their Best Alternative Party; whereas the party from which they derive the lowest expected utility is their Worst Alternative Party. All the hypotheses discussed here relate to voters with an incentive to cast a tactical vote.

Outreach by each party is expected to have a different impact on voter behavior. Contact by a voter's Most Preferred party is likely to increase the chances of sincere voting. First, the party may remind the voter why she preferred it, strengthening a desire to cast an expressive vote, to signal her preferences (see, e.g., Hamlin and Jennings, 2011). Second, voters may experience a form moral bias (Feddersen et al., 2009) that favors truthful representation of their preferences,

[9] *See, Milazzo et al. (2020).*

which contact by their preferred party may reinforce. Third, the voter may interpret being contacted by their Most Preferred party as a signal that the party is viable.

> H1. Contact by a voter's Most Preferred party increases the probability of a sincere vote, and reduces the probability of a tactical one.

Contact by the Best Alternative party should have the opposite effect; it should increase the chances of a tactical vote and reduce the chances of a sincere one. The Best Alternative party can rely on encouraging a voter to behave instrumentally, to cast a 'useful' vote that influences the electoral outcome. There is anecdotal evidence that parties try to incite these instrumental motivations. For example, a pamphlet by the Labour candidate for Epsom and Ewell in 2019 is entitled "It's a two horse race in Epsom and Ewell" with the backside highlighting that "Labour was second behind Chris Grayling [Conservative] with double the vote of the Lib Dems, confirming that Labour is the only party that can beat the Tories here."[10] This ability to incite instrumental motivations is typically not hampered by high expressive costs, as the Best Alternative party is typically somewhat well-liked,[11] although this is less so for voters with a moral bias in favor of truthful representation.

> H2. Contact by a voter's Best Alternative party reduces the probability of a sincere vote, and increases the probability of a tactical one.

Contact by the Worst Alternative party should encourage voters' tactical behavior, but effects should be weaker. Contact by the Worst Alternative party may produce or increase the fear that a disliked party will succeed. Voters perceiving this should be more likely to cast a tactical vote in favor of their Best Alternative party.

> H3. Contact by a voter's Worst Alternative party reduces the probability of a sincere vote, and increases the probability of a tactical one.

[10] *See https://www.openelections.co.uk/leaflets/39007/*

[11] *Voters assign an average thermometer of 7.95 to their Most Preferred party and 5.49 to their Best Alternative party.*

Finally, the impact of party contacts may depend on the strength of tactical incentives but, a priori, this relationship may go either direction. On the one hand, stronger incentives may lead to weaker effects. Voters are likely to realize the value of casting a tactical vote on their own, without needing the encouragement of the Best Alternative party. At the same time, it could be more difficult for the Most Preferred party to encourage a sincere vote, as the expected utility loss from doing so is larger. On the other hand, strong tactical incentives may lead to larger effects: when incentives are strong, the Best Alternative party can more easily increase the salience of the high expected utility gain of tactical voting, potentially making their contacts more effective. Thus, the direction in which the strength of tactical incentives influences the effectiveness of party contacts must be empirically adjudicated, as the following statement indicates:

> H4. The effect of party contacts on tactical voting depends on the strength of (positive) tactical incentives. The stronger the tactical incentives, the smaller [H4a] or the larger [H4b] the impact.

3 Data & Methods

I use data from nine waves of the British Election Study (BES) Online Panel (Fieldhouse et al., 2020), covering the 2015, 2017, and 2019 Elections for English, Scottish, and Welsh Westminster Constituencies.[12]

3.1 Tactical Incentives Measure and Variable Definitions

I follow the measure proposed by Eggers and Vivyan (2020), who define a voter's tactical incentive, τ, as the expected utility difference between casting a vote for their Best Alternative Party (the one that gives them the highest expected utility, other than their Most Preferred) and their Most Preferred Party. I measure utilities using feeling thermometers for the parties, with

[12] *The BES excludes Northern Ireland.*

ties broken by thermometers for party leaders, and then by party identification.[13] Calculating tactical incentives requires preferences for at least three parties and no ties for the most preferred (after tie-breaking); this implies a loss of 22% of respondents from the original BES sample.[14] Pivotal probabilities used to calculate expected utilities are also obtained following Eggers and Vivyan (2020), who rely on the assumption that the voteshare for each party in a constituency follows a Dirichlet distribution. From this framework, I also define the Worst Alternative Party as the one that gives the voter the lowest expected utility. Additional details on the calculation of the tactical incentives measure are available in Appendix A. Appendix F present alternative results using ideological closeness to measure utilities and subjective pivotal probabilities derived from voters' assessments of the chances of winning for each party.

The outcome of interest is a categorical variable with three values: (1) the voter *abstains*; (2) casts a *sincere* vote for their Most Preferred party; (3) casts a *tactical* vote for their Best Alternative party.[15]

The main independent variables are three indices measuring contact by the Most Preferred, the Best Alternative, and the Worst Alternative parties, built by counting the number of modes in which a party contacted a voter in each wave, which include: telephone, mailed letter or leaflet, home canvassing, meeting in the street, email, SMS, and social media. Contact indices are preferred to binary indicators because: (1) indices provide a more nuanced measure that better approximates the intensity of contact, and (2) a large portion of voters are sent the candidate address during one of the three waves, delivered free-of-charge by the Royal Mail, diminishing the variation in the binary measure.[16] Núñez (2021) shows that contact indices aggregated

[13] *All utilities are non-negative. Some voters may perceive a 'harm' from certain parties winning, suggesting negative utility. However, incentives depend on relative expected utilities; considering negative utilities below a certain thermometer threshold does not alter the results.*

[14] *This need not be problematic as the main analysis focus on voters with positive incentives: missing thermometers may reflect a lack of preference and thus no incentive to behave tactically.*

[15] *A small percentage of voters who cast a vote for a party that is neither their Most Preferred nor their Best Alternative are excluded from the analysis. Including them with sincere voters or adding them as fourth outcome category ('other choice') does not substantially alter the results.*

[16] *While delivery is free, candidates must still ford the cost of producing their address. Ap-*

by constituency correlate closely with campaign expenditures, providing some validity to the measure. Appendix D.4 provides alternative estimates using separate indicators for each mode of contact and discusses those results, which are largely consistent with those obtained using the indices.

As control variables, I include the feeling thermometer for the Most Preferred party, the difference in thermometers between the Most Preferred and the Best Alternative parties, and that between the Best Alternative and the Worst Alternative parties.[17] Controlling for preferences in the election wave is important to disentangle the impact that contacts have on tactical/expressive behavior from the impact they may have on preferences (which may in turn affect behavior). That is, they allow to capture the impact of party outreach on tactical voting that is separate from the traditional persuasion effects studied in the broader campaigns literature. I also include a number of demographic characteristics: respondents' age, race, gender, indicators for household income terciles, two indicators for education level, two indicators for home ownership, and the number of children in the household. I also control for a measure of political attention, year fixed-effects, constituency-level voteshare for each party,[18] constituency-level campaign spending by Most Preferred, Best, and Worst Alternative parties as a percentage of constituency spending limits, and decile indicators for the tactical voting incentive, τ, that control for the strength of the tactical voting incentive non-linearly.

3.2 Estimating the Effect of Party Contacts

An important empirical challenge is endogeneity in party contacts, partly stemming from parties' own strategic behavior. In fact, there is evidence that parties increasingly target specific voters or groups they deem likely to affect the electoral outcome (Hillygus and Shields, 2008; Hassell and Monson, 2014, 2015). While parties' targeting strategies are likely imperfect, estimates of the impact of party contacts on tactical voting will be upwardly biased. It will

proximately 45% of voters indicate receiving mailers from the Conservatives and Labour in some wave. For the election wave, about 30% indicate receiving mailers from these two parties.

[17] *This is equivalent to controlling for the feeling thermometers of these three parties.*

[18] *Omitting Conservative voteshare to avoid near-perfect multicollinearity.*

appear that parties are more effective at changing voter behavior because estimates will partly reflect the fact that parties tend to contact voters who may already be likely to behave in the desired way.

The BES data allows me to address the endogeneity concerns originating in parties' behavior, while not being privy to their decision making process. I do this with the combination of two factors. First, I directly control for vote intention in the pre-election wave. As such, the estimates will not be biased if parties mainly contacted voters who already intended to vote their preferred way. Second, I use the pre-election waves in each election to estimate parties' contact behavior and, from this, generate predicted contact probabilities for the election wave. The impact of party contacts on tactical voting is then estimated using only the election wave for each year, including these predicted probabilities and pre-election vote intention as additional control variables. Predicted probabilities and pre-election vote intention do not use contact data from the election wave in each election, thus helping control for parties' strategic behavior in a manner that is separate from actual contacts conducted in the election wave.

To obtain the predicted contact probabilities, I first estimate the probability that a voter is contacted by each party based on the individual- and constituency-level variables described in the previous section, relying on the first two waves for each election:

$$P(Contact^{p}_{it} = 1) = \Lambda(\alpha^{p} + \beta^{p} x_{it}),\ t \in \{1, 2\},\ p = \textit{Con, Lab, LD, SNP, PC, UKIP, Grn, Bxt} \tag{1}$$

where $Contact^{p}_{it}$ equals 1 if voter i reports being contacted by party p in the four weeks prior to wave t; x_{it} are the control variables; α^{p} and β^{p} are parameters for party p; and $\Lambda(\cdot)$ is a logistic link. Full model estimates for equation 1 for each year and party are available in Appendix Table C2.

From the models in equation 1, I calculate predicted probabilities of contact for the election wave each year:

$$PrContact^{p}_{i3} = \Lambda(\widehat{\alpha}^{p} + \widehat{\beta}^{p} x_{i3}),\ p = \textit{Con, Lab, LD, SNP, PC, UKIP, Grn, Bxt} \tag{2}$$

where $PrContact^{p}_{i3}$ is the predicted probability that individual i is contacted by party p in wave $t = 3$, based on the estimated parameters $\widehat{\alpha}^{p}$ and $\widehat{\beta}^{p}$ obtained from equation 1.

For these predicted probabilities to be valid measures of the likelihood of contact for the election wave one must assume that parties' contact strategies remain constant throughout the campaign. That is, that the types of voters that parties contact do not differ systematically over time. In Appendix B, I show that this is likely to be the case. First, I show that observed characteristics have little power to predict the contact indices in the election wave after controlling for predicted probabilities. Additionally, I show that predicted probabilities estimated using data from the first two waves have a very high correlation with predicted probabilities estimated using data form the election wave.[19] All of this strongly suggests that whom parties' contact remains stable over time, at least with respect of observed characteristics.[20] Note that the stability of outreach strategies across waves does not mean that parties do not ramp up their campaign efforts closer to election day; in fact they do. The stability means that parties contact the same types of voters, just more of them more intensely. Additionally, note that this does not speak to the content of these contacts, which may vary over time.

The predicted probabilities depend on observable characteristics. If part of the endogeneity is instead driven by unobserved factors (at least somewhat independent from observable ones), the predicted probabilities on their own would not be sufficient to account for endogeneity. The inclusion of the pre-election vote intention plays an important role in this case. If the unobserved characteristic(s) in question are persistent over time, they will be captured in pre-election intended behavior, thus reducing endogeneity concerns.[21]

[19] *Please note that this is not the same as the correlation between pre-election predicted probabilities and actual contacts in the election wave, which is smaller.*

[20] *Núñez (2021) presents two other alternative ways to show that parties' contact strategies likely remain constant throughout each campaign, using the same data.*

[21] *It is possible that some unobserved characteristic that varies between campaign waves is both correlated with contact and voting behavior in the election wave but that does not affect pre-election vote intention similarly. It is unlikely that such a variable, if it exists, would create significant bias, since it would need to have sufficient variation that is independent of observed characteristics and not simultaneously influencing pre-election behavior to meaningfully bias the main estimates.*

Finally, to estimate the effect of party contacts on the probability of casting a tactical vote, I use a multinomial model that focuses exclusively on voters with a positive incentive to cast a tactical vote ($\tau_i > 0$):

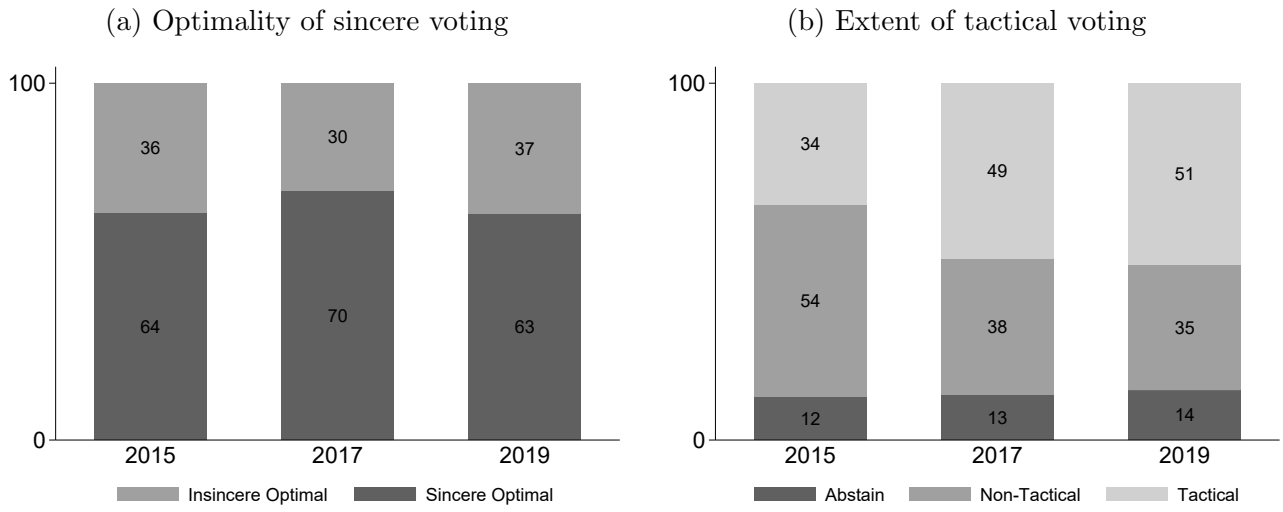
$$\begin{aligned} P(y_{i3} = k) \;=\; & \Lambda(\alpha_k + \beta_{k1} ContMP_{i3} + \beta_{k2} ContBA_{i3} + \beta_{k3} ContWA_{i3} + \\ & \pi_{k1} PredMP_{i3} + \pi_{k2} PredBA_{i3} + \pi_{k3} PredWA_{i3} + \\ & \delta_{k1} PreAbs_{i3} + \delta_{k2} PreTac_{i3} + \gamma_k Controls_{i3}) \end{aligned} \tag{3}$$

where y_{i3} is a categorical variable for individual i in wave $t = 3$ that indicates whether i abstained ($k = 0$), voted sincerely ($k = 1$), or voted tactically ($k = 2$); $contMP_{i3}$, $contBA_{i3}$, and $contWA_{i3}$ are the contact indices by i's Most Preferred, Best Alternative, and Worst Alternative parties for wave $t = 3$; $PredMP_{i3}$, $PredBA_{i3}$ and $PredWA_{i3}$ are the predicted contact probabilities for each party; and $PredAbs_{i3}$ and $PredTac_{i3}$ indicate whether i intended to abstain or vote tactical in the wave prior to $t = 3$. $Controls_{i3}$ are a set of control variables from the election wave; these include the feeling thermometers for election wave, which are important to disentangle the effect that contacts may have on tactical/expressive motivations, from the fact that contacts may also change voters' preferences; that is, to distinguish the encouragement of loyalty/defection from the traditional persuasion effect that operates through a change in preferences. Appendix E also presents results using a fixed-effects model and a lagged-contact model, which are qualitatively similar to those presented in the main text.

4 Results

Panel (a) of Figure 1 shows the percentage of voters for whom tactical voting is the optimal decision ($\tau > 0$). About a third or more of the electorate would benefit from casting a tactical vote, a substantial proportion. Panel (b) shows the percentage of voters that voted tactically, non-tactically, or abstained, among voters with $\tau > 0$. For 2015, about 34% of these voters cast a tactical vote, a figure in-line with most previous research (see Alvarez et al., 2018). For 2017

Figure 1: Optimality and extent of tactical voting



Note: Panel (a) shows that between 30 and 37 percent of voters have incentives to vote insincerely. Panel (b) shows that among those with incentives to vote tactically, about 34 to 51 percentage actually do so, depending on the election.

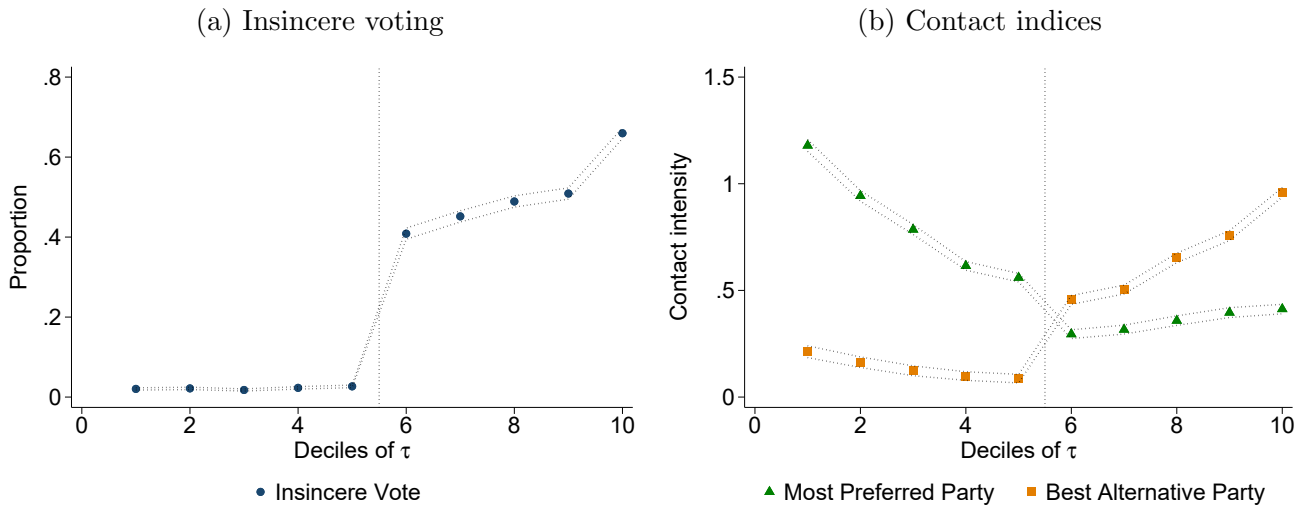
and 2019 this increases substantially, to about 50% of voters with positive tactical incentives.

Panel (a) in Figure 2 shows how the proportion of voters casting an insincere vote for the Best Alternative party changes with the tactical incentive (τ), grouped by deciles. An insincere vote is extremely unlikely among voters with a negative τ: voters who would be hurt by voting insincerely, do not do so. Additionally, the proportion of voters who cast a tactical vote among those with an incentive to do so ($\tau > 0$), increases with the strength of that incentive.

Panel (b) in Figure 2 shows the average contact index intensity (in wave 3) by the Most Preferred and Best Alternative parties as a function of τ. Contact intensity by the Most Preferred party is highest when the voter has no incentive to vote tactically ($\tau < 0$), and drops noticeably when tactical voting is optimal ($\tau > 0$). Additionally, the intensity of contact by a voter's Best Alternative party is lowest when the voter has no incentive behave tactically, and it increases noticeably when tactical voting is optimal.[22] This illustrates that parties' contact behavior is not immune to the tactical incentives faced by voters. In Appendix D.1, I show

[22] *Contacts are least intense for voters with $\tau \approx 0$ (5th and 6th deciles). These tend to be voters in safe constituencies, where there are little incentives to vote one way or another.*

Figure 2: Tactical behavior and incentives



Note: The dashed vertical line separates positive and negative values of the tactical incentive. Panel (a) shows that voters respond to incentives, casting insincere votes when they have incentives to do so. Panel (b) shows that parties' respond to voters' incentives; the Most Preferred is is more likely to contact voters with no incentives to cast tactical voters, while the Best Alternative party is more likely to contact voters with tactical incentives.

that this pattern holds even after accounting for constituency-level characteristics (although the pattern is less stark). This means that it is not sufficient to control for constituency-level characteristics to account for the strategic behavior of parties: contact intensity varies with tactical incentives within constituencies as well as across them.

4.1 The Effect of Party Contacts on Tactical Voting

Table 1 presents average partial effects for selected variables from Equation 3 (Appendix Table C1 shows full coefficient estimates). Both the predicted contact probabilities and pre-election vote intention have significant effects on voting behavior, which underscores the importance of controlling for these variables when estimating the effect of party contacts.[23] To a lesser extent, so do the feeling thermometers.[24]

[23] *Appendix D.6 shows that ignoring these controls leads to twice-as-large estimates.*

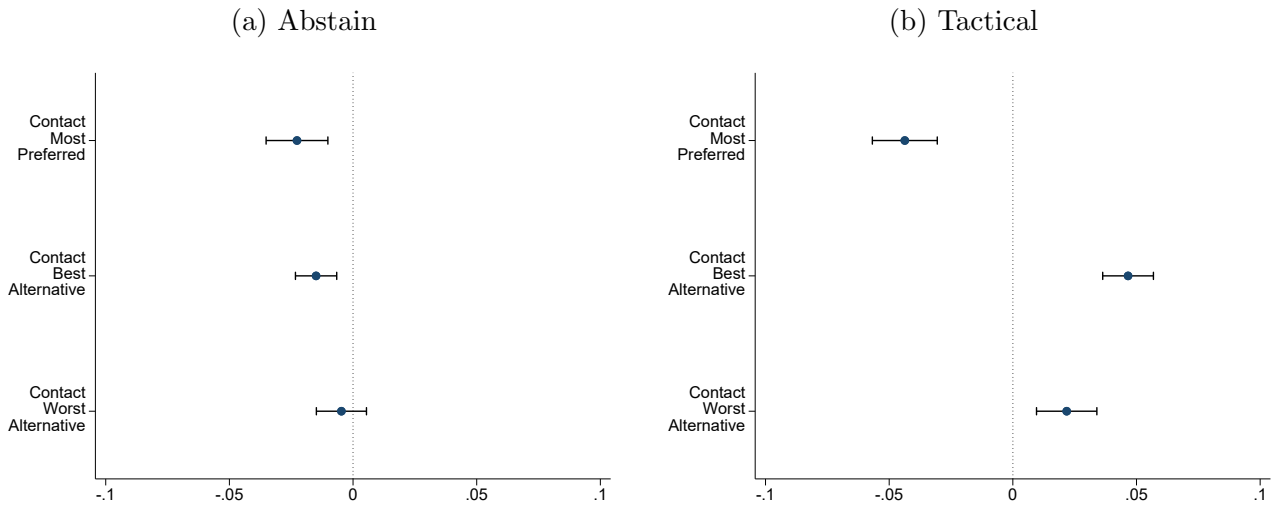
[24] *Note that the feeling thermometers also influence the tactical incentives measure, so they are partially controlled for by the deciles of τ included in the model.*

Table 1: Selected APEs from Main Model

	Abstain	Sincere	Tactical
Contact Most Preferred	-0.023**	0.066**	-0.044**
	(0.006)	(0.006)	(0.007)
Contact Best Alternative	-0.015**	-0.032**	0.047**
	(0.004)	(0.005)	(0.005)
Contact Worst Alternative	-0.005	-0.017**	0.022**
	(0.005)	(0.006)	(0.006)
Predicted probabilities Most Preferred	-0.081*	0.563**	-0.482**
	(0.035)	(0.041)	(0.046)
Predicted probabilities Best Alternative	0.005	-0.206**	0.201**
	(0.024)	(0.037)	(0.036)
Predicted probabilities Worst Alternative	-0.012	-0.063	0.076
	(0.034)	(0.047)	(0.044)
Pre-election intention to abstain	0.081**	-0.191**	0.110**
	(0.005)	(0.011)	(0.012)
Pre-election intention to vote tactically	-0.016**	-0.342**	0.359**
	(0.005)	(0.007)	(0.006)
Spending by Most Preferred	-0.000	0.001**	-0.001**
	(0.000)	(0.000)	(0.000)
Spending by Best Alternative	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Spending by Worst Alternative	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Feeling thermometer Most Preferred	-0.003	-0.004	0.007*
	(0.002)	(0.003)	(0.003)
Thermometer difference, Most Preferred-Best Alternative	0.002	0.018**	-0.020**
	(0.002)	(0.003)	(0.003)
Thermometer difference, Best Alternative-Worst Alternative	-0.004**	-0.007**	0.011**
	(0.001)	(0.002)	(0.002)
Additional controls	Yes	Yes	Yes
Observations	10562	10562	10562

Note: t-statistics in parentheses. $^{*}p < 0.05$,$^{**}p < 0.01$. APEs show that contact by Most Preferred, Best Alternative, and Worst Alternative parties influences voting behavior in the expected directions, encouraging loyalty or defection to the Most Preferred party.

Figure 3: Average partial effect of party contacts



Note: Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level. Panel (a) shows that contact by the Most Preferred and Best Alternative parties reduce abstentions. Panel (b) shows that contact by the Most Preferred party increases tactical voting, whereas contact by the Best Alternative and Worst Alternative parties increases it.

Figure 3 shows the average partial effect of contact by the Most Preferred, Best Alternative, and Worst Alternative parties on the probability that a voter abstains or casts a tactical vote. These partial effects are the equivalent of approximately a 2 standard deviations increase in the contact indices.[25] Heterogeneous effects by Most Preferred party and election cycle are available in Appendices D.2 and D.3

Contact by a voter's Best Alternative and Most Preferred parties leads to a reduction in abstentions of 1.5 and 2.3 percentage points, respectively. Contact by the Worst Alternative party does not have a statistically significant effect on abstentions.

Contact by a voter's Most Preferred party leads to a 4.4 percentage points reduction in the probability of a tactical vote. Combined with the 2.3 percentage points reduction in the probability of abstention, this results in an 6.6 percentage points increase in the probability of a sincere vote. On the other hand, the impact of contact by the Best Alternative party leads to an

[25] *This is a large increase considering that the average contact intensity by the Most Preferred and Best Alternative parties are approximately 0.4 and 0.7, respectively.*

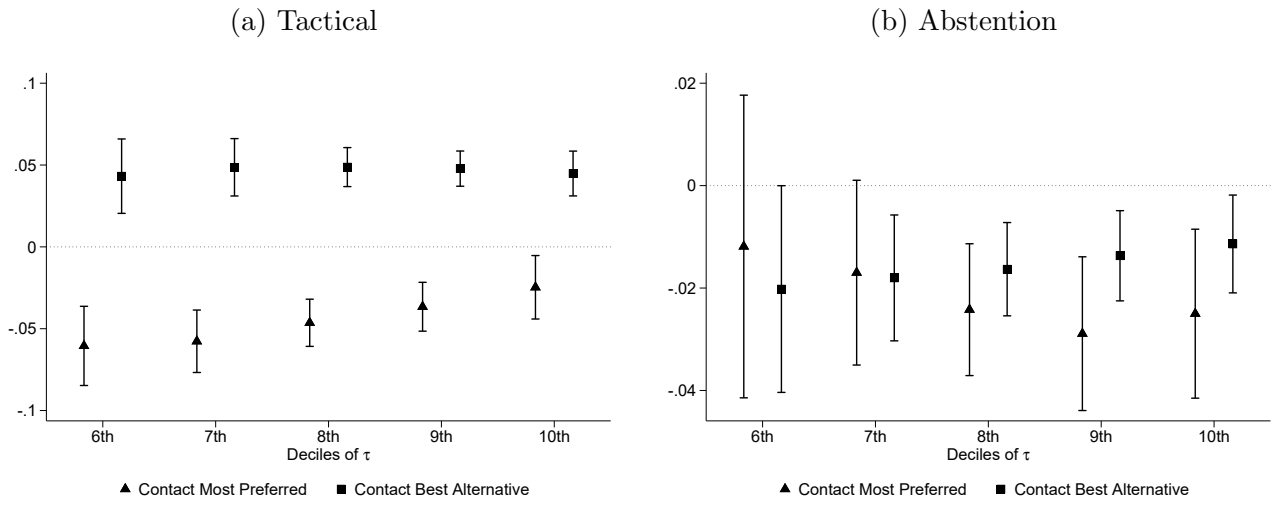
increase of 4.7 percentage points in the probability of a tactical vote and a 3.2 percentage point reduction in the probability of a sincere vote. These results are thus consistent with hypotheses H1 and H2. The impact of contact by these two parties is similar (of opposite sign) suggesting that neither party has the upper hand in encouraging voters to vote tactically or sincerely.

Contact by the Worst Alternative party leads to a small increase of 2.2 percentage points in the probability of casting a tactical vote, and a 1.7 percentage point reduction in the probability of a sincere vote. These effects are thus consistent with hypothesis H3. It is likely that contact by the Worst Alternative party backfires, perhaps reminding the voter of the risks associated with a sincere vote.

It is important to note that the effects in Figure 3 control for voters' feeling thermometers, and thus do not constitute the traditional persuasion/conversion effects operating through preferences. Appendix Figure D7 estimates for voters *without* an incentive to behave tactical ($\tau < 0$) and finds no effects of party contacts: voters without an incentive to cast a tactical vote are not encouraged nor discouraged to do so by party contacts. This reinforces the the point that the effects in Figure **??** are different from the traditional persuasion effects: if the main effects operated through preferences, similar effects should be found among voters without a tactical incentive. Additionally, Appendix Figure D8 shows that the impact of party contacts on preferences is similar between voters with and without a tactical incentive, suggesting that differences between the appendix and the main effects cannot be explained by preferences either.

Figure 4 shows how the impact of contacts by the Most Preferred and Best Alternative parties vary with voters' tactical incentives, obtained from a version of equation 3 with interactions between the contact variables and tactical incentives measure (full model coefficients are available in Appendix Table C2). Panel (a) focuses on tactical voting, and in the case of contact by the Most Preferred party, the results are consistent with alternative H4a: the stronger the incentives, the weaker the effect of party contacts. This ranges from a reduction in tactical voting of 6.2 percentage points for voters in the 6th decile of tactical incentives (the

Figure 4: APEs by strength of positive tactical incentives



Note: Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level. Panel (a) shows that the impact contact by the Most Preferred party weakens as tactical incentives increase, but not for contact by the Best Alternative party. Panel (b) shows that the effect of party contacts on abstentions does not vary with the strength of tactical incentives.

weakest positive incentives) to a 2.5 percentage point reduction for voters in the 10th decile. In the case of contact by the Best Alternative party, however, the results are not consistent with either alternative in H4: the effects do not vary significantly with voters' tactical incentives. Appendix D.5 shows that these patterns also hold when interacting the contact indices with the closeness of the race between the viable parties and with the distance from contention of the Most Preferred party. There is no evidence, however, that the effectiveness of party contacts varies with the utility difference between the viable parties.

Panel (b) in Figure 4 shows how the impact of contact by the Most Preferred and Best Alternative parties on abstentions differ by the deciles of the tactical voting incentive. In this case, there are no statistically significant patterns emerging. This suggests that abstention does not respond to the strength of tactical incentives. Instead, the tactical voting increase from contact by the Most Preferred party observed in the left panel is predominantly the result of a choice between casting a tactical or a sincere vote.[26]

[26] *Notice that while the effect for the Most Preferred party increases with tactical incentives,*

4.2 Partial Counterfactuals

The average partial effects in Figure 3 can only present an incomplete picture of the impact of party contacts on tactical voting because parties conduct campaigns of different intensities, as Figure 2 illustrates. Here I conduct a series of four partial counterfactual exercises that allow for a better understanding of the magnitude of the effects of party contacts. The first three counterfactuals assume one of the parties does not conduct any voter contacts whatsoever. The fourth one assumes that neither party contact any voters. For each counterfactual, I compute two versions. The first focuses on the intensive margin, measuring the impact of party contacts on the voters contacted by the parties in the election wave. The second focuses on the extensive margin, and thus considers all voters with a positive incentive (whether contacted by parties or not).

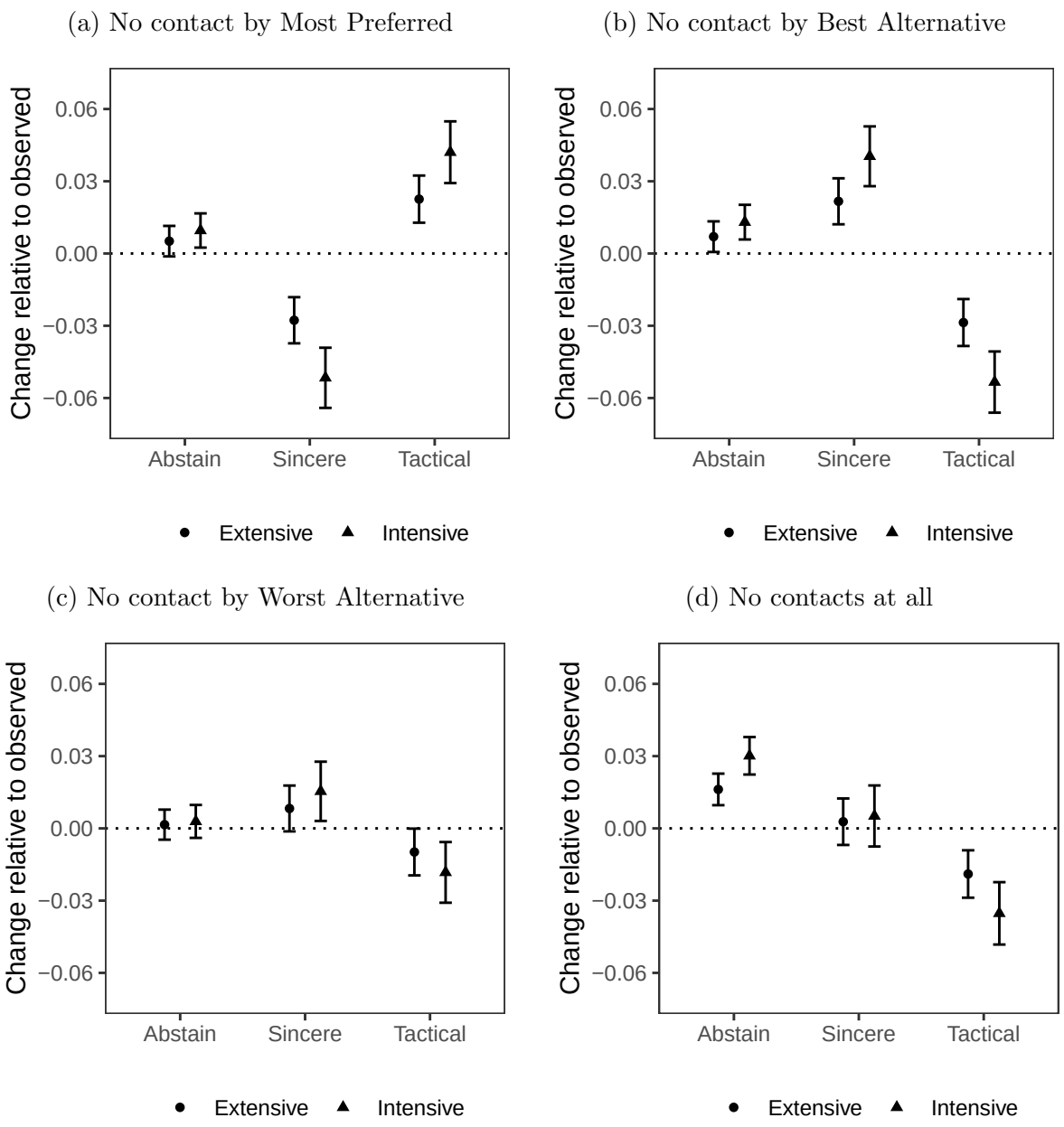
It is important to note that these counterfactuals are *partial counterfactuals*: the change in the behavior of a party is assumed not to generate any strategic response by the other parties. This is unlikely to occur in reality, as parties are likely to respond to each other's actions and reach a new equilibrium. However, these partial counterfactuals allow for a better understanding of the magnitudes of the impact of party behavior on tactical voting, as well as glance into the forces involved in parties' strategic considerations out of the equilibrium path.

Figure 5 presents the results from the four counterfactuals for both margins. The intensive margin focuses exclusively on voters actually contacted by the parties, measuring the impact of party contacts among them; thus, they mainly serve to understand the magnitude of the effects reported in Figure 3. Had the Most Preferred party not contacted voters, tactical voting would have been 4.2 percentage points higher among contacted voters; had the Best Alternative party not contacted voters, tactical voting would have been 5.3 percentage points lower; and had the Worst Alternative party not contacted any voters, tactical behavior among those contacted would have been 1.8 percentage points lower.

The extensive margin focuses instead on all voters with a positive tactical incentive, and

this increase is not statistically significant.

Figure 5: No contact partial counterfactuals



Note: Confidence intervals are at the 95% level. Each panel compares in-sample behavior to predicted behavior if a party did not contacted voters, among all voters (extensive margin) and among voters contacted (intensive margin). Panel (d) shows that had no parties contacted voters, tactical voting would be lower, abstentions higher, and sincere voting unchanged.

serves as an approximation to the impact of party contacts on the election overall. Under the counterfactual that each voter's Most Preferred party conducts no direct voter outreach,

sincere voting would be 2.8 percentage points lower, whereas tactical voting would be 2.3 percentage points higher (the impact on abstentions is positive but not significant). Under the counterfactual that the Best Alternative party conducts no contacts, sincere voting would be 2.2 percentage points higher, while tactical voting would be 2.9 percentage points lower. Additionally, there would be slightly more abstentions (0.7 percentage points). The counterfactual that the Worst Alternative party conducts no outreach shows an increase of about 1 percentage point in tactical voting (the effects for sincere voting and abstentions are not significant). Finally, the fourth counterfactual shows the combined impact of the previous three. Overall, had parties not contacted voters with an incentive to cast a tactical vote, there would have been higher levels of abstentions (1.6 percentage points) and tactical voting would have been 1.9 percentage points lower than observed in-sample.

To summarize, these counterfactuals show that contact by the Most Preferred and Best Alternative parties have a significant impact on the levels of tactical voting and, to a more limited extent, so does contact by the Worst Alternative party. While the overall impact of party contacts is not large, a 2 percentage points increase in tactical voting is sufficient to flip close races.

5 Conclusion

There is a rich literature on tactical voting with a focus on measuring its extent. This is of course vital, as understanding the extent of tactical voting establishes its relevance as an observed political behavior rather than an interesting theoretical possibility. Less attention has been paid to the factors that drive voters to behave tactically, especially those over which electoral participants have agency during the campaign period. This article thus fills a gap in the literature by studying the impact of party contacts on tactical voting behavior. It is important to note that contacts are not the only actionable factor that may influence tactical behavior. It is likely that national campaigns, national advertising, major events and leader speeches also influence voters' choices.

My findings show that contact by the Most Preferred, Best Alternative, and Worst Alternative parties influences tactical voting. Contact by a voter's Most Preferred party encourages loyalty and consequently a sincere vote; whereas contact by a voter's Best Alternative party encourages defection in the form of a tactical vote. Additionally, the impact of contact by the Most Preferred party is strongest among voters with the weakest (but positive) incentives to behave tactically. A comparison of the in-sample voter behavior to a partial counterfactual in which parties do not conduct direct voter outreach, shows that party contacts account for about a 2 percentage points increase in tactical voting behavior, an amount sufficient to flip marginal constituencies.

While these results come from the UK, they likely apply to other multiparty cases or instances of multi-candidate elections (e.g., US primaries) where the electoral system provides some incentives to behave tactically. But these results also stand in contrast to findings in the US literature on persuasion, which typically finds either null (Kalla and Broockman, 2018) or minimal effects (Brady et al., 2006), especially for Presidential Elections. This difference in findings may partly stem from methodology, with US literature relying more extensively on experiments. My results use observational data, and while great care has been taken to address endogeneity, unmeasured confounders remain a possibility. But there are also substantive differences. The US literature focuses on conversion (through persuasion, changes in preferences) of voters who may originally prefer a different party. The differences between the US and UK electoral contexts are perhaps even more important. As a polarized two-party system with few cross-pressured voters, the US has less fertile ground for campaigns. In the multiparty UK system, substantial numbers of voters have at least somewhat positive views about more than one party, allowing more room cross-pressures.[27] Additionally, voters can influence the outcome of the election by deviating from their top preference, an opportunity not available to US voters.[28]

The findings in this paper have important practical as well as normative implications. On the

[27] *The average thermometer score is 7.95 for the Most Preferred party and 5.49 for the Best Alternative party.*

[28] *The US has third parties, but they garner a minuscule proportion of the national vote in recent decades.*

practical side, they show that parties can benefit from attempts at targeting potential tactical voters. These targeting efforts will necessarily remain imperfect, as parties rarely know voters' preferences. However, parties can rely on a variety of heuristics (demographic and geographical) to accomplish this. Additionally, the results also suggest that the practice of highlighting the tactical situation in a constituency (as UK parties often do) is likely a valuable.

On the normative side, the results highlight that tactical behavior is the result of voters' beliefs, preferences, information, values, and as shown here, parties' campaigns. From a purely instrumental perspective, contact by Best Alternative parties and the consequent increase in tactical voting may enhance voters' political efficacy by helping them elect a 'less bad' government. However, this presumes that the information, signals, or cues revealed by campaigns are accurate and truthful. This is not always the case, although Gschwend and Meffert (2017) argue that voters, especially those with an incentive to behave tactically, 'are not fools' and often treat information with skepticism. However skeptical voters may be, this type of influence of campaigns on voting behavior also provides an additional avenue for a role of money in politics, potentially swaying outcomes in favor of those who control it.

In the longer term, the instrumental voter behavior encouraged by party campaigns can also lead to a consolidation of the party system into a smaller, but more viable set of parties (Downs, 1957), improving representation in the long term. However, this is far from guaranteed, as (1) minority views may fail to coordinate in viable a alternative, and (2) newly emerging minority views may completely fail to mature due to tactical defections.

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Appendix for: Encouraging Loyalty and Defection: The Impact of Campaigns on Tactical Voting in Britain

Lucas Núñez

Table of Contents

A Tactical Incentives Measure

As mentioned in the main text, I rely on the measure proposed by Eggers and Vivyan (2020) to capture tactical incentives at the individual voter level. This tactical incentives measure, τ, is defined as:

$$\tau \equiv \max_{j \in \{2,...,k\}} p(j) \cdot u - p(1) \cdot u \tag{4}$$

where k is the number of parties; $p(j) = \big[p_1(j), p_2(j), ..., p_k(j)\big]$ is a vector that contains the probability of winning for each party when the voter casts a vote for party j; $u = \big[u_1, u_2, ..., u_k\big]$ is a vector that contains the utility derived from each party being elected; and the vector $p(1) = \big[p_1(1), p_2(1), ..., p_k(1)\big]$ measures the probability that each party will win if the voter casts a sincere vote, that is a vote for the party they prefer the most. Thus, $p(1) \cdot u = p_1(1)u_1 + p_2(1)u_2 + ... + p_k(1)u_k$ measures the expected utility of casting a sincere vote, and the term $\max_{j \in \{2,...,k\}} p(j) \cdot u$ measures the expected utility of casting a vote for the Best Alternative party, the party that gives the voter the highest expected utility (other than their Most Preferred one). From this framework, I also define a voter's Worst Alternative party as the party that gives the voter the lowest expected utility. Notice that if there are only two parties, the tactical incentive is necessarily negative. Thus, in two-candidate elections, a tactical vote is never optimal.

Voters with a negative tactical voting incentive do not benefit from casting tactical vote, as deviating from their Most Preferred party gives them a lower expected utility. Voters with a positive tactical voting incentive ($\tau > 0$), on the other hand, would benefit from casting a tactical vote for their Best Alternative party. The main analysis in this article focuses on these voters.

This measure of tactical incentives summarizes in a single value a variety of proxies that the literature has used to approximate them. In terms of preferences, the smaller the utility gap between a Most Preferred party and a Best Alternative party, the higher the tactical incentives; and the larger the utility gap between the Best Alternative and the Worst Alternative parties, the higher the tactical incentives. In terms of chances of winning, the poorer the expected

performance of the Most Preferred party, the higher the tactical incentives; and the closer the race between the Best Alternative and Worst Alternative parties, the higher the tactical incentives. As such, this theoretically-derived measure of tactical incentives appropriately captures the combination of proxies typically used in the tactical voting literature.

To measure the utilities derived from each party, u, I rely on feeling thermometers from the BES data. Any ties are first broken by the feeling thermometers for the party leaders (if available), and then by party identification. Pivotal probabilities, $p(j)$, are obtained following the procedure in Eggers and Vivyan (2020), who rely on the assumption that the voteshare for each party in a given constituency follows a Dirichlet distribution with parameter vector sv, where v is the vector of voteshares actually observed in the constituency, and s is a scalar measure of precision, which I set to 85.[1]

Most analyses in the article use indicators for deciles of τ for ease of exposition as well as to allow for non-linearity with respect to the tactical incentives. Please note that these deciles are in reality constructed as the set of quintiles among positive values of τ, and the set the quintiles among the non-positive τs. This is to ensure that there is no decile containing both positive and negative values of τ.

Additionally, Appendix F presents two sets of alternative results: one using ideological closeness to define utilities and the other using inferred subjective pivotal probabilities.

B Validity of Contact Probabilities

The estimates presented in this article partly rely on predicted probabilities of contact to address parties' (potential) strategic contact behavior. This requires assuming that parties contact behavior remains roughly stable throughout an election campaign. Under this assumption, the predicted probabilities of contact estimated using observable characteristics from the first

[1] *Eggers and Vivyan (2020) choose the precision measure s that minimizes the "surprise" of election results compared to pre-election predictions. Their optimal s using data from the 2005, 2010, and 2015 elections is 85, which is why I use it here. Their analysis shows that results do not vary very noticeably with the choice of s (within a range).*

two waves provide a reasonable approximation to parties' intention to contact specific types of voters during the final survey wave. It is important to highlight here that this means parties contact the same *types* of voters, not necessarily the same individual voters.

I provide two pieces of evidence suggesting that party contact strategies remain stable within each campaign. Table B1 shows the correlation between the predicted probabilities estimated from equation 1 by using data for the first two waves, and predicted probabilities estimated by using data from the election wave for each year. The high correlation in the vast majority of cases indicates that parties are likely using the same contact strategies in the election wave, compared to the previous two.[2] Please note that these results do not imply that the predicted probabilities estimated using data from the pre-election waves have such a high correlation with *actual* contacts in the election wave.[3] There are some party-years for which the correlation is lower: UKIP in 2017, and Brexit for 2019. However, while lower, these correlations are still substantially high.

Table B1: Correlation of Predicted Probabilities: Pre & Post Election

	2015	2017	2019
Con	87.25	89.86	85.01
Lab	95.48	96.86	95.55
LD	94.67	97.30	93.94
SNP	95.05	97.32	95.65
PC	88.53	95.22	95.61
Grn	90.33	.	86.96
UKIP	76.74	67.03	.
Bxt	.	.	72.09

Table B2 shows the ratio between the R^2 of two regressions. The numerator comes from a model that regresses the contact index for a particular party during the election wave on the predicted probabilities of contact (from the first two waves) plus all control variables used in equation 1. The denominator comes from a similar model that includes only the predicted

[2] *Note that high correlations do not mean that the probabilities are at the same levels in the election wave relative to the others. In fact, contact probabilities are higher across the board for the election wave because campaigns efforts are more intense closer to election day. They do show, however, that the higher the contact probability in the first two waves, the higher the contact probability in the election wave.*

[3] *In fact, the correlation between predicted probabilities and dummy contact indicators for the election wave 0.36 for the Most Preferred party and 0.34 for the Best Alternative party.*

probabilities as independent variables (and no other variables). The ratios presented in Table B2 are all substantially high, which indicates that all the control variables included first model add relatively little predictive power to the contact probabilities. Put another way, the predicted probabilities estimated from the first two waves are, by far, the dominant factor in predicting the contact index during the election wave. If party contact strategies were not attempting to contact the same types of voters, then these ratios would be substantially smaller, as specific observed characteristics (captured by the control variables) would have more predictive power.

Table B2: Proportion of Explained Variance in Contacts from Predicted Probabilities

	2015	2017	2019
Con	84.93	79.16	84.37
Lab	91.52	94.03	91.46
LD	91.39	93.50	89.31
SNP	93.54	96.82	97.35
PC	96.31	96.23	95.31
Grn	86.59	.	65.77
UKIP	65.97	61.85	.
Bxt	.	.	70.88

Using the same data, but for a different purpose, Núñez (2021) shows that (1) the average characteristics of voters contacted by each party do not differ between survey waves in the same election; and (2) that random forests models trained on data for different survey waves result in predictions for the other waves that have high levels of agreement. This provides additional evidence that the parties' contact strategies remain relatively stable throughout each election campaign.

As noted in Section 3, the predicted contact probabilities control for endogeneity in parties' contact behavior insofar as it relates to observable/measured voter and constituency characteristics. The inclusion of pre-election vote intention in the main model additionally helps to account for endogeneity in the main model that could originate in persistent unobserved characteristics influencing both party contact decisions and voter behavior.

C Full Models from Main Text

Table C1 shows the full coefficient estimates for the models in Figures 3 and 4. The first two columns for the Figure 3 Model correspond to coefficient estimates for the outcomes Abstain (relative to sincere voting) and Tactical (relative to sincere voting). The third column, VIF, contains the Variance Inflation Factor for the independent variables in that model. The average VIF is 2.12. None of the variables have a VIF above 10, usually used as a cutoff for substantial multicollinearity. Almost all variables (with the exception of year dummies) have VIFs below 5, which means the independent variables are moderately correlated, but they contain sufficient independent variation.

The first column for the Figure 4 Model corresponds to the coefficient estimates for the outcome Abstain (relative to sincere voting) and the final column to the outcome Tactical (relative to sincere voting).

Table C2 presents the coefficient estimates for the logit models from equation 1. Each column corresponds to a specific party and election cycle. The rows with names beginning with "Th" correspond to feeling thermometers. Missing feeling thermometers were replaced with zero to avoid losing observations. The rows with names ending in "miss" are dummy variables indicating that the missing feeling thermometers were replaced with a zero.

Table C1: Full Models (coefficients) from Figures 3 and 4

	Figure 3 Model			Figure 4 Model	
	Abstain	Tactical	VIF	Abstain	Tactical
Cont. Most Pref.	-0.700***	-0.494***	1.41	0.285	-0.834**
	[-5.55]	[-9.84]		[0.34]	[-2.64]
Cont. Best Alt.	-0.097	0.338***	1.61	-0.329	0.178
	[-1.12]	[7.63]		[-0.60]	[0.55]
Cont. Worst Alt.	0.004	0.169***	1.50	-0.829	0.160
	[0.04]	[3.44]		[-1.40]	[0.49]
Pred. Prob. MP	-4.081***	-4.636***	1.41	-4.092***	-4.682***
	[-5.94]	[-12.88]		[-5.94]	[-12.99]
Pred. Prob. BA	1.086*	1.798***	2.52	1.079*	1.783***
	[2.21]	[5.88]		[2.23]	[5.85]
Pred. Prob. WA	0.098	0.605	2.17	0.130	0.593
	[0.14]	[1.64]		[0.19]	[1.60]
Spend Most Pref.	-0.008*	-0.010***	1.42	-0.008*	-0.010***
	[-2.08]	[-4.35]		[-2.07]	[-4.31]
Spend Best Alt.	-0.000	0.001	3.30	-0.001	0.001
	[-0.16]	[0.84]		[-0.24]	[0.72]
Spend Worst Alt.	0.001	0.002	3.32	0.001	0.002

	[0.53]	[1.32]		[0.58]	[1.33]
Th. Most Pref.	-0.030	0.051	2.24	-0.033	0.051
	[-0.78]	[1.90]		[-0.85]	[1.90]
Th. Diff. MP-BA	-0.050	-0.168***	2.20	-0.050	-0.168***
	[-1.54]	[-7.45]		[-1.54]	[-7.43]
Th. Diff. BA-WA	-0.040	0.079***	2.45	-0.038	0.080***
	[-1.45]	[4.47]		[-1.37]	[4.52]
Pre-intend Abstain	2.274***	1.363***	1.19	2.421***	1.198***
	[19.13]	[13.18]		[7.49]	[4.30]
Pre-intend Tactical	1.382***	3.081***	1.41	1.648***	3.094***
	[11.08]	[42.97]		[5.17]	[15.98]
7th tau dec.	0.091	0.209*	1.73	0.068	0.305**
	[0.62]	[2.26]		[0.31]	[2.58]
8th tau dec.	0.168	0.333**	2.02	0.237	0.376**
	[1.09]	[3.23]		[1.12]	[2.88]
9th tau dec.	0.246	0.449***	2.45	0.435	0.428**
	[1.36]	[4.05]		[1.86]	[3.14]
10th tau dec.	0.418*	0.512***	3.05	0.229	0.493**
	[2.11]	[4.08]		[0.82]	[3.08]
Year=2017	-0.117	-0.234	6.10	-0.133	-0.233
	[-0.52]	[-1.46]		[-0.59]	[-1.46]
Year=2019	0.327	0.189	6.98	0.313	0.190
	[1.30]	[1.13]		[1.24]	[1.14]
Age	-0.000	0.003	1.73	-0.000	0.003
	[-0.12]	[1.26]		[-0.09]	[1.25]
White	-1.593***	-0.124	1.06	-1.605***	-0.126
	[-10.61]	[-1.05]		[-10.61]	[-1.06]
Income T2	-0.342**	-0.045	1.34	-0.339**	-0.044
	[-2.91]	[-0.61]		[-2.87]	[-0.59]
Income T3	-0.524***	-0.082	1.60	-0.515***	-0.077
	[-3.94]	[-1.03]		[-3.86]	[-0.97]
Female	-0.249**	0.058	1.07	-0.245*	0.058
	[-2.60]	[1.01]		[-2.56]	[1.01]
Education T2	0.081	-0.024	1.52	0.075	-0.026
	[0.62]	[-0.27]		[0.56]	[-0.28]
Education T3	-0.423**	-0.018	2.09	-0.424***	-0.016
	[-3.28]	[-0.21]		[-3.30]	[-0.19]
Renter	0.402**	-0.120	1.46	0.405**	-0.122
	[3.13]	[-1.46]		[3.15]	[-1.48]
Owner Outright	-0.075	-0.019	1.84	-0.072	-0.021
	[-0.55]	[-0.25]		[-0.53]	[-0.26]
n Child	0.065	0.099	1.16	0.064	0.095
	[0.49]	[1.26]		[0.49]	[1.20]
Pol. Attention	-0.108***	0.029	1.17	-0.110***	0.029
	[-5.02]	[1.90]		[-5.09]	[1.94]
Share Lab	-0.001	-0.008***	1.88	-0.001	-0.008***
	[-0.41]	[-3.37]		[-0.37]	[-3.31]
Share LD	0.000	-0.005	2.68	0.000	-0.005
	[0.01]	[-1.22]		[0.01]	[-1.20]
Share SNP	-0.006	-0.007**	1.71	-0.006	-0.007**
	[-1.41]	[-2.74]		[-1.41]	[-2.75]
Share PC	-0.009	-0.008	1.07	-0.009	-0.007
	[-0.91]	[-1.19]		[-0.97]	[-1.14]
Share UKIP	-0.021	-0.063***	4.10	-0.022	-0.063***
	[-1.40]	[-5.37]		[-1.46]	[-5.39]
Share Grn	-0.023	-0.036***	1.27	-0.023	-0.036***
	[-1.27]	[-3.35]		[-1.29]	[-3.34]
Share Bxt	-0.058**	-0.060***	1.41	-0.056**	-0.059***
	[-3.14]	[-5.14]		[-3.07]	[-5.08]
Cont. Most Pref. × Tau deciles				-0.124	0.041
				[-1.22]	[1.11]
Cont. Best Alt. × Tau deciles				0.027	0.020

				[0.42]	[0.53]
Cont. Worst Alt. × Tau deciles				0.103	0.001
				[1.44]	[0.04]
Pre-intend Abstain=1 × 7th tau dec.				-0.031	0.186
				[-0.08]	[0.55]
Pre-intend Abstain=1 × 8th tau dec.				-0.160	0.217
				[-0.42]	[0.64]
Pre-intend Abstain=1 × 9th tau dec.				-0.628	0.135
				[-1.51]	[0.40]
Pre-intend Tactical=1 × 7th tau dec.				-0.122	-0.171
				[-0.30]	[-0.71]
Pre-intend Tactical=1 × 8th tau dec.				-0.436	-0.116
				[-1.02]	[-0.46]
Pre-intend Tactical=1 × 9th tau dec.				-0.613	0.025
				[-1.43]	[0.10]
Constant	1.322*	-0.917**		1.335*	-0.936**
	[2.56]	[-2.81]		[2.57]	[-2.79]

Baseline category is sincere voting. t-statistics in brackets. $^{*}p < 0.05, ^{**}p < 0.01, ^{***}p < 0.001$

Table C2: First Stage Models by Party and Year

	2015							2017						2019						
	Con	Lab	LD	SNP	PC	UKIP	Grn	Con	Lab	LD	SNP	PC	UKIP	Con	Lab	LD	SNP	PC	Bxt	Grn
Th. Con	0.06***	-0.03	-0.08***	-0.01	-0.07	-0.03	-0.07	0.06***	-0.03***	-0.04***	-0.00	-0.01	-0.03	0.04***	-0.02	-0.04**	0.02	0.05	-0.05*	0.01
	[3.93]	[-1.83]	[-3.70]	[-0.25]	[-0.61]	[-1.18]	[-1.87]	[7.09]	[-3.74]	[-4.04]	[-0.03]	[-0.46]	[-1.71]	[4.06]	[-1.81]	[-2.88]	[0.80]	[1.29]	[-2.27]	[0.34]
Th. Lab	-0.04**	0.07***	-0.08***	-0.08**	-0.11	-0.06**	-0.16***	0.01	0.12***	-0.04***	-0.01	-0.00	0.04*	0.01	0.13***	-0.01	-0.02	0.01	0.02	0.02
	[-2.90]	[5.59]	[-3.93]	[-3.03]	[-1.43]	[-2.61]	[-4.72]	[0.66]	[15.51]	[-4.85]	[-0.39]	[-0.01]	[2.05]	[1.18]	[12.80]	[-0.75]	[-0.64]	[0.16]	[1.16]	[1.02]
Th. LD	0.01	-0.02	0.15***	-0.05	-0.10	-0.02	-0.06	0.01	-0.02**	0.13***	-0.02	0.02	-0.02	-0.03***	-0.08***	0.06***	-0.07**	-0.15*	-0.09***	-0.07**
	[0.91]	[-1.58]	[7.43]	[-1.91]	[-1.75]	[-1.06]	[-1.75]	[1.18]	[-3.10]	[12.15]	[-0.85]	[0.73]	[-1.23]	[-3.52]	[-8.75]	[5.48]	[-3.03]	[-2.27]	[-4.73]	[-3.28]
Th. SNP	-0.04	-0.02	-0.03	0.09***		-0.11	0.02	0.01	0.00	0.01	0.08***		0.02	-0.01	0.02*	0.03*	0.06*		0.06**	0.06**
	[-1.28]	[-0.83]	[-0.81]	[4.03]		[-1.53]	[0.37]	[1.19]	[0.43]	[1.16]	[4.93]		[1.19]	[-0.57]	[2.03]	[2.32]	[2.37]		[2.98]	[2.72]
Th. PC	0.04	0.01	-0.03		0.23***	0.07	0.07	0.00	-0.04**	-0.09***		0.05	-0.05	0.06	-0.03	0.01		0.18**	0.13**	-0.11
	[1.11]	[0.42]	[-0.64]		[3.46]	[0.89]	[0.70]	[0.15]	[-2.74]	[-3.71]		[1.44]	[-1.25]	[1.65]	[-1.13]	[0.45]		[3.22]	[3.02]	[-1.23]
Th. UKIP	-0.03*	-0.05***	-0.04	-0.05	-0.07	0.07***	-0.07*	-0.03***	-0.02***	-0.03**	-0.02	-0.01	0.08***							
	[-2.39]	[-3.56]	[-1.82]	[-1.49]	[-1.00]	[3.49]	[-2.38]	[-4.28]	[-3.36]	[-2.76]	[-0.90]	[-0.25]	[4.83]							
Th. Bxt														0.01	-0.01	0.01	-0.04	0.02	0.14***	-0.01
														[0.58]	[-1.07]	[0.94]	[-1.53]	[0.44]	[8.46]	[-0.52]
Th. Grn	0.00	0.02	-0.02	0.06*	-0.08	-0.05*	0.22***	0.00	0.02**	0.00	-0.00	-0.04	-0.00	0.03**	0.04***	0.03*	0.09**	-0.02	-0.03	0.16***
	[0.05]	[1.11]	[-0.84]	[2.05]	[-0.90]	[-2.06]	[6.21]	[0.05]	[2.86]	[0.09]	[-0.14]	[-1.33]	[-0.23]	[2.97]	[4.45]	[2.52]	[2.97]	[-0.51]	[-1.53]	[6.62]
Th. Con miss	0.15	0.50	-0.26	0.00	0.00	0.16	15.62***	-0.97	0.02	0.13	0.00	0.00	-0.29	-0.04	-0.35	0.99**	0.00	0.00	-0.15	0.00
	[0.18]	[0.38]	[-0.27]	[.]	[.]	[0.07]	[14.44]	[-1.58]	[0.05]	[0.22]	[.]	[.]	[-0.41]	[-0.08]	[-0.97]	[2.75]	[.]	[.]	[-0.30]	[.]
Th. Lab miss	-1.34*	-0.22	-1.35	0.00	0.00	-1.10	-1.53	-0.21	0.36	-0.99	0.38	0.00	-0.67	0.07	0.54	-0.41	1.45	0.00	0.21	0.77
	[-2.07]	[-0.17]	[-1.85]	[.]	[.]	[-0.47]	[-1.82]	[-0.44]	[1.08]	[-1.94]	[0.35]	[.]	[-1.05]	[0.16]	[1.64]	[-1.01]	[1.09]	[.]	[0.44]	[0.69]
Th. LD miss	0.18	-0.67	0.52	-0.69	0.00	0.46	-14.72***	-0.04	-0.49*	-0.20	-0.16	-0.48	-0.28	-0.53	-0.32	-0.32	0.94	0.00	-0.45	-1.47
	[0.22]	[-0.96]	[0.67]	[-0.62]	[.]	[0.58]	[-23.00]	[-0.18]	[-2.36]	[-0.68]	[-0.54]	[-0.51]	[-0.49]	[-1.76]	[-1.33]	[-0.77]	[1.70]	[.]	[-0.91]	[-1.30]
Th. SNP miss	0.50	1.62**	-0.90	1.88		-0.32	1.37	-0.27**	-0.21*	-0.19	0.00		-0.37	-0.19*	-0.16	-0.15	0.00		0.08	0.14
	[0.64]	[3.11]	[-0.73]	[1.77]		[-0.23]	[1.05]	[-2.78]	[-2.34]	[-1.78]	[.]		[-1.55]	[-2.10]	[-1.91]	[-1.57]	[.]		[0.43]	[0.71]
Th. PC miss	0.50	0.33	-0.32		0.00	-0.10	1.53*	-0.40**	-0.55***	-0.53*		-1.14	-0.72**	0.29	0.01	0.03		0.00	0.29	-0.34
	[1.30]	[1.03]	[-0.70]		[.]	[-0.21]	[1.98]	[-2.81]	[-4.09]	[-2.21]		[-0.92]	[-2.95]	[1.34]	[0.09]	[0.10]		[.]	[1.05]	[-0.49]
Th. UKIP miss	-0.06	-0.84	-0.83	-0.05	0.00	1.16*	0.00	-0.33	-0.34	-0.12	-1.57	0.74	1.17*							
	[-0.14]	[-1.69]	[-1.14]	[-0.07]	[.]	[2.33]	[.]	[-1.16]	[-1.19]	[-0.34]	[-1.42]	[0.72]	[2.28]							
Th. Bxt miss														-0.39*	-0.56***	-0.60*	-0.58	-0.86	-1.27	-0.97
														[-2.13]	[-3.42]	[-2.37]	[-1.11]	[-1.17]	[-1.89]	[-1.69]
Th. Grn miss	-0.24	-0.15	0.18	-0.80	0.00	-0.71	0.10	-0.13	-0.33**	-0.18	-0.46	-1.01	-0.76*	0.09	0.26	-0.08	0.01	-0.16	-0.66	-0.53
	[-1.17]	[-0.83]	[0.68]	[-1.33]	[.]	[-1.95]	[0.13]	[-1.07]	[-2.63]	[-1.18]	[-1.05]	[-1.43]	[-2.25]	[0.58]	[1.72]	[-0.39]	[0.02]	[-0.23]	[-1.85]	[-0.71]
Age	0.01***	0.00	0.01**	0.01	0.01	0.00	0.01	0.01***	0.01***	0.01***	0.01**	0.01	0.02***	0.01**	0.01***	0.00	0.01	0.00	-0.00	0.01
	[3.58]	[1.52]	[3.18]	[1.55]	[0.47]	[0.75]	[0.93]	[4.86]	[5.90]	[4.81]	[3.00]	[1.96]	[4.17]	[3.02]	[4.10]	[0.11]	[1.62]	[0.07]	[-0.58]	[1.25]
White	0.25	0.21	0.10	0.01	-1.45*	-0.01	-0.41	0.11	0.08	0.11	-0.07	-0.23	-0.07	0.16	0.20**	0.21*	0.06	0.39	-0.08	0.01
	[1.92]	[1.70]	[0.55]	[0.07]	[-2.42]	[-0.04]	[-1.85]	[1.49]	[1.20]	[1.42]	[-0.32]	[-0.68]	[-0.40]	[1.65]	[2.65]	[2.21]	[0.30]	[0.93]	[-0.52]	[0.04]
Inc. T2	0.04	0.00	0.14	-0.17	-0.33	-0.15	-0.16	0.02	-0.06	-0.05	-0.03	0.02	-0.11	0.07	0.04	0.06	-0.23	0.20	-0.05	0.14
	[0.49]	[0.02]	[1.18]	[-0.93]	[-0.49]	[-1.17]	[-0.89]	[0.43]	[-1.43]	[-0.87]	[-0.22]	[0.11]	[-1.12]	[1.32]	[0.74]	[1.02]	[-1.62]	[0.60]	[-0.47]	[1.25]
Inc. T3	0.14	0.06	0.24	0.06	0.55	0.03	-0.29	0.12*	-0.02	0.01	0.02	-0.27	-0.06	0.16**	0.14*	0.24***	-0.06	0.22	0.18	0.04
	[1.63]	[0.69]	[1.89]	[0.30]	[1.12]	[0.18]	[-1.46]	[2.45]	[-0.54]	[0.16]	[0.15]	[-1.21]	[-0.58]	[2.85]	[2.41]	[3.71]	[-0.34]	[0.62]	[1.60]	[0.28]
Female	-0.06	-0.10	-0.05	-0.28*	-0.33	-0.22*	-0.26	-0.05	-0.07*	-0.08	-0.17*	-0.16	-0.11	-0.01	-0.01	-0.12*	-0.15	-0.21	-0.18*	-0.15
	[-0.96]	[-1.85]	[-0.49]	[-2.21]	[-0.75]	[-2.09]	[-1.85]	[-1.38]	[-1.99]	[-1.90]	[-2.05]	[-1.13]	[-1.45]	[-0.32]	[-0.27]	[-2.40]	[-1.13]	[-0.97]	[-2.21]	[-1.73]
Edu. T2	0.20*	0.13	0.11	0.07	0.39	-0.02	0.54*	0.24***	0.25***	0.11	0.12	0.36	0.29*	0.27***	0.24***	0.23**	0.25	0.60	0.24	0.50***
	[2.12]	[1.49]	[0.76]	[0.31]	[0.53]	[-0.12]	[2.35]	[4.36]	[4.71]	[1.72]	[0.90]	[1.70]	[2.47]	[4.43]	[3.79]	[3.09]	[1.23]	[1.48]	[1.86]	[3.31]
Edu. T3	0.36***	0.36***	0.45***	0.32	1.05*	0.37**	0.28	0.48***	0.39***	0.41***	0.48***	0.78***	0.36***	0.51***	0.40***	0.46***	0.48**	0.55	0.49***	0.59***
	[4.63]	[4.84]	[3.53]	[1.68]	[2.21]	[2.87]	[1.27]	[10.09]	[8.14]	[7.30]	[4.16]	[3.62]	[3.46]	[9.93]	[6.98]	[7.02]	[2.93]	[1.45]	[4.55]	[4.17]
Renter	-0.12	0.00	-0.05	-0.08	0.38	-0.02	0.24	-0.03	-0.04	-0.02	-0.08	0.07	0.10	-0.05	-0.05	0.10	-0.24	-0.12	0.04	0.08
	[-1.32]	[0.04]	[-0.34]	[-0.46]	[0.70]	[-0.14]	[1.33]	[-0.59]	[-0.89]	[-0.32]	[-0.53]	[0.32]	[0.77]	[-0.76]	[-0.74]	[1.35]	[-1.52]	[-0.33]	[0.34]	[0.64]
Owner	-0.02	-0.08	0.04	0.04	0.08	0.11	-0.01	0.06	-0.03	0.01	-0.07	0.05	-0.07	0.05	-0.02	0.15*	-0.16	0.13	0.12	0.08
	[-0.21]	[-1.00]	[0.33]	[0.23]	[0.15]	[0.78]	[-0.06]	[1.31]	[-0.67]	[0.26]	[-0.62]	[0.21]	[-0.67]	[1.01]	[-0.44]	[2.35]	[-0.99]	[0.59]	[1.02]	[0.60]
n Child	0.04	-0.02	0.12	0.21	1.02*	0.13	-0.08	-0.20***	-0.11*	-0.19**	-0.12	-0.14	-0.22	-0.19**	-0.06	-0.14	-0.23	-0.17	-0.11	0.14
	[0.51]	[-0.25]	[0.99]	[1.16]	[2.10]	[0.98]	[-0.42]	[-3.75]	[-2.23]	[-3.19]	[-0.92]	[-0.60]	[-1.84]	[-3.28]	[-0.96]	[-1.89]	[-1.25]	[-0.69]	[-0.95]	[1.16]
Self. ideo	0.01	-0.04*	-0.02	-0.06	-0.02	-0.04	-0.09	0.03**	-0.04***	-0.03*	-0.08*	-0.02	0.04	0.04**	-0.03*	-0.01	0.00	-0.03	0.01	0.01
	[0.60]	[-2.11]	[-0.54]	[-1.38]	[-0.16]	[-1.30]	[-1.70]	[2.58]	[-3.55]	[-2.14]	[-2.41]	[-0.59]	[1.55]	[3.22]	[-2.35]	[-0.42]	[0.13]	[-0.36]	[0.56]	[0.35]
Tau dec.=2	-0.52***	-0.34**	0.04	-0.21	1.02	-0.21	-0.33	-0.27***	-0.07	-0.18	-0.27*	-0.20	-0.19	-0.29***	-0.21*	-0.03	-0.22	0.72	-0.26	0.39
	[-3.85]	[-2.62]	[0.20]	[-0.86]	[1.39]	[-0.98]	[-0.93]	[-4.22]	[-1.08]	[-1.85]	[-2.32]	[-0.71]	[-1.18]	[-3.77]	[-2.55]	[-0.22]	[-1.24]	[1.43]	[-1.84]	[1.81]
Tau dec.=3	-0.94***	-0.68***	0.04	-0.26	0.34	-0.36	-0.57	-0.47***	-0.14*	0.00	-0.23	0.09	-0.28	-0.62***	-0.31**	-0.07	-0.17	0.84	-0.42*	0.33
	[-6.28]	[-4.94]	[0.17]	[-1.00]	[0.28]	[-1.58]	[-1.57]	[-6.27]	[-1.98]	[0.01]	[-1.09]	[0.26]	[-1.65]	[-6.50]	[-3.24]	[-0.45]	[-0.73]	[1.33]	[-2.37]	[1.39]
Tau dec.=4	-1.56***	-1.23***	-0.85**	-0.14	2.09*	-0.69***	-0.61	-0.67***	-0.31***	-0.05	-0.48	-0.14	-0.17	-1.15***	-0.74***	-0.28	-0.65*	0.06	-1.30***	-0.10
	[-10.24]	[-8.00]	[-3.21]	[-0.39]	[2.08]	[-3.38]	[-1.44]	[-7.04]	[-3.79]	[-0.43]	[-1.24]	[-0.40]	[-1.00]	[-11.36]	[-7.72]	[-1.84]	[-2.28]	[0.08]	[-5.30]	[-0.39]
Tau dec.=5	-1.66***	-1.40***	-0.66**	-1.14*	0.00	-1.20***	-0.75*	-0.77***	-0.48***	-0.10	-0.14	-0.04	-0.41*	-1.30***	-0.95***	-0.42**	0.11	-0.58	-0.70***	0.14
	[-10.29]	[-9.03]	[-2.70]	[-2.22]	[.]	[-4.45]	[-1.99]	[-7.94]	[-5.70]	[-0.76]	[-0.38]	[-0.14]	[-2.08]	[-12.19]	[-9.60]	[-2.80]	[0.27]	[-0.48]	[-3.44]	[0.60]
Tau dec.=6	-1.52***	-1.66***	-0.25	-0.22	3.39***	-1.04***	-0.13	-0.82***	-0.65***	0.07	-1.13	0.37	0.08	-1.26***	-1.07***	-0.28	0.02	1.31	-0.29	0.57*
	[-7.43]	[-8.74]	[-1.04]	[-0.36]	[3.73]	[-3.30]	[-0.38]	[-7.92]	[-5.36]	[0.50]	[-1.64]	[1.00]	[0.39]	[-11.04]	[-10.12]	[-1.79]	[0.03]	[1.66]	[-1.60]	[2.46]
Tau dec.=7	-1.57***	-1.22***	0.25	-0.98	0.00	-0.66**	-0.16	-0.60***	-0.34***	0.04	-0.29	0.09	-0.11	-1.18***	-0.81***	-0.10	-0.71	0.58	-0.46*	0.46
	[-8.90]	[-7.42]	[1.15]	[-1.83]	[.]	[-2.71]	[-0.45]	[-5.53]	[-3.64]	[0.32]	[-0.73]	[0.24]	[-0.56]	[-10.15]	[-7.48]	[-0.69]	[-1.75]	[0.75]	[-2.40]	[1.91]
Tau dec.=8	-0.69***	-0.72***	0.05	-0.28	1.87*	-0.04	0.20	-0.46***	-0.26**	0.13	-0.61*	0.25	0.04	-0.61***	-0.29**	0.13	-0.03	0.79	0.04	0.79***
	[-4.39]	[-4.75]	[0.23]	[-0.85]	[2.54]	[-0.17]	[0.55]	[-4.70]	[-3.00]	[1.20]	[-2.47]	[0.73]	[0.18]	[-6.20]	[-2.91]	[0.87]	[-0.12]	[1.11]	[0.24]	[3.52]
Tau dec.=9	-0.34*	-0.15	0.38	0.06	0.46	-0.07	0.24	-0.18*	-0.19*	-0.11	-0.21	0.00	0.47*	-0.31**	-0.32**	0.05	-0.35	0.57	0.05	0.38
	[-2.22]	[-1.09]	[1.80]	[0.23]	[0.64]	[-0.29]	[0.71]	[-2.13]	[-2.37]	[-0.93]	[-1.33]	[0.00]	[2.30]	[-3.25]	[-3.18]	[0.42]	[-1.66]	[1.22]	[0.28]	[1.60]
Tau dec.=10	-0.20	-0.08	0.02	-0.82	0.98	0.24	0.18	-0.03	-0.16*	0.05	-0.23	-0.08	-0.19	-0.16	-0.09	0.36**	-0.30	0.88	0.30*	0.72***
	[-1.52]	[-0.59]	[0.10]	[-1.71]	[1.10]	[1.07]	[0.55]	[-0.53]	[-2.07]	[0.57]	[-1.60]	[-0.29]	[-0.89]	[-1.68]	[-1.00]	[3.10]	[-1.49]	[1.62]	[2.11]	[3.38]
Share Lab	-0.03***	0.02***	-0.00	-0.01	-0.06***	-0.02***	0.00	-0.02***	0.02***	0.01*	-0.00	0.02	-0.01***	-0.02***	0.02***	0.01***	-0.01	0.00	0.00	0.01
	[-8.05]	[5.86]	[-0.26]	[-0.72]	[-4.25]	[-3.88]	[0.37]	[-8.08]	[10.67]	[2.25]	[-0.54]	[1.08]	[-3.65]	[-6.16]	[7.26]	[3.97]	[-1.42]	[0.23]	[0.55]	[1.92]
Share LD	-0.02**	-0.00	0.10***	-0.01	-0.00	0.02*	0.01	-0.01*	0.01*	0.06***	-0.01	0.01	0.00	-0.01***	0.00	0.08***	0.00	0.00	-0.01	0.01*
	[-3.15]	[-0.76]	[13.68]	[-0.38]	[-0.28]	[2.33]	[1.36]	[-2.18]	[2.33]	[16.03]	[-1.29]	[0.66]	[0.59]	[-4.06]	[0.26]	[16.11]	[0.64]	[0.10]	[-0.93]	[1.98]
Share SNP	-0.03	0.03**	-0.04	-0.01		-0.03	0.00	-0.01***	0.00	0.00	-0.03**		-0.02***	-0.02***	-0.01***	-0.00	-0.01		-0.02***	-0.00
	[-1.88]	[2.91]	[-1.45]	[-0.50]		[-0.85]	[0.11]	[-3.69]	[1.48]	[0.20]	[-3.11]		[-3.55]	[-7.89]	[-3.99]	[-1.04]	[-0.68]		[-3.77]	[-0.36]
Share PC	-0.09***	-0.04	-0.05**		0.03***	-0.11**	0.01	-0.06***	-0.01*	-0.01		0.05***	-0.02	-0.04***	-0.01	0.01		0.05***	-0.03*	-0.03
	[-3.51]	[-1.74]	[-2.78]		[4.32]	[-2.76]	[0.64]	[-5.12]	[-2.24]	[-0.67]		[6.23]	[-1.09]	[-4.61]	[-0.93]	[0.34]		[4.30]	[-2.06]	[-1.13]
Share UKIP	-0.06***	-0.03**	-0.03	-0.06	-0.00	0.09***	-0.01	-0.07***	-0.01	-0.06***	-0.19	-0.06	0.20***							
	[-5.10]	[-2.86]	[-1.95]	[-0.68]	[-0.02]	[6.43]	[-0.68]	[-3.35]	[-0.83]	[-3.50]	[-1.90]	[-0.68]	[13.51]							
Share Bxt														-0.09***	-0.02	-0.05**			0.07***	-0.03
														[-6.21]	[-1.96]	[-2.75]			[9.14]	[-1.65]
Share Grn	-0.07***	-0.01	-0.01	-0.10	0.24*	-0.02	0.09***	-0.04***	-0.01**	0.01	-0.04	0.13	-0.01	-0.05*	-0.00	-0.04	-0.01	0.15**	-0.03	0.07***
	[-3.59]	[-0.92]	[-0.48]	[-1.67]	[2.19]	[-0.94]	[4.88]	[-3.74]	[-2.94]	[0.33]	[-1.82]	[0.62]	[-0.52]	[-2.38]	[-0.19]	[-1.66]	[-0.20]	[2.89]	[-1.07]	[4.95]
Constant	-0.34	-3.18***	-2.32	-0.16	-2.15	-2.16	-5.84***	-0.95***	-2.47***	-2.84***	0.27	-4.18***	-3.88***	-1.55***	-2.93***	-4.15***	-1.60*	-5.79***	-3.79***	-6.07***
	[-0.35]	[-4.43]	[-1.67]	[-0.13]	[-1.26]	[-1.36]	[-3.64]	[-4.02]	[-10.25]	[-8.76]	[0.47]	[-3.79]	[-8.27]	[-4.78]	[-10.58]	[-9.95]	[-1.97]	[-4.03]	[-7.06]	[-7.06]
Observations	14638	14638	14638	2602	1110	14638	14508	25694	25694	25694	3162	1757	25694	24415	24415	24415	2426	1389	24415	24277

D Additional Results

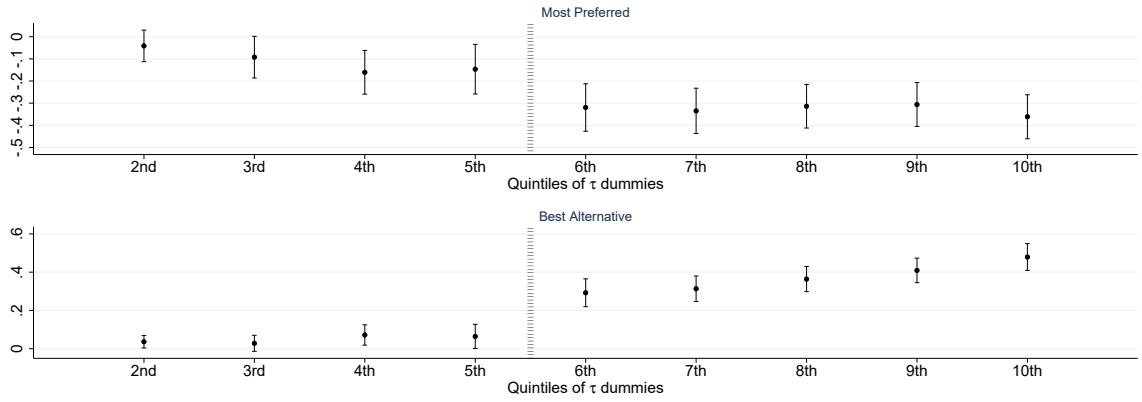
D.1 Contact Variation by Tactical Incentives

Here, I show that parties' contact strategies vary with individual tactical incentives, even when holding constituency-level incentives constant. To do so, I estimate a model in which the outcome variable is the contact index for a given party and the independent variables include deciles of the tactical voting incentives, and a variety of demographic characteristics described in the data section. Importantly, this model also includes fixed effects by Most Preferred party, fixed effects by constituency, and the average tactical incentive for individuals who prefer the same party in the same constituency.[4] This means that the estimates of the coefficients for the deciles of the tactical voting incentive are within most-preferred party, within constituency, and controlled for the average tactical incentive for voters in the same constituency and who prefer the same party. Should parties only vary their behavior at the constituency level without any individual-level component, the coefficients for the deciles should be zero. However, Figure D1 shows this is not the case. The individual-level tactical incentives have some power in predicting party contacts. This is most evident when comparing the effects of the negative and positive deciles of the tactical incentives. This implies that, within Most Preferred party and constituency, individual tactical voting incentives are still predictive of party contacts. Thus controlling for constituency-level party behavior (like target seats) is not sufficient to account for the strategic behavior of parties.

These results also show that while targeting voters based on their individual incentives is very difficult, as it requires information about voters that parties usually lack, parties still manage to target voters (likely using a variety of proxies) potential tactical voters to some degree/

[4] *Ideally, one would include constituency-most-preferred-party fixed effects. However, this presents a severe estimation problem since the sample sizes are not sufficiently large to estimate such a model (it would require some 4,000 dummies). Therefore, the use of the average tactical incentive by constituency-most-preferred-party is intended to approach these.*

Figure D1: Contact Indices by Tactical Incentives (after controls)



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

D.2 Heterogeneous Effects By Party

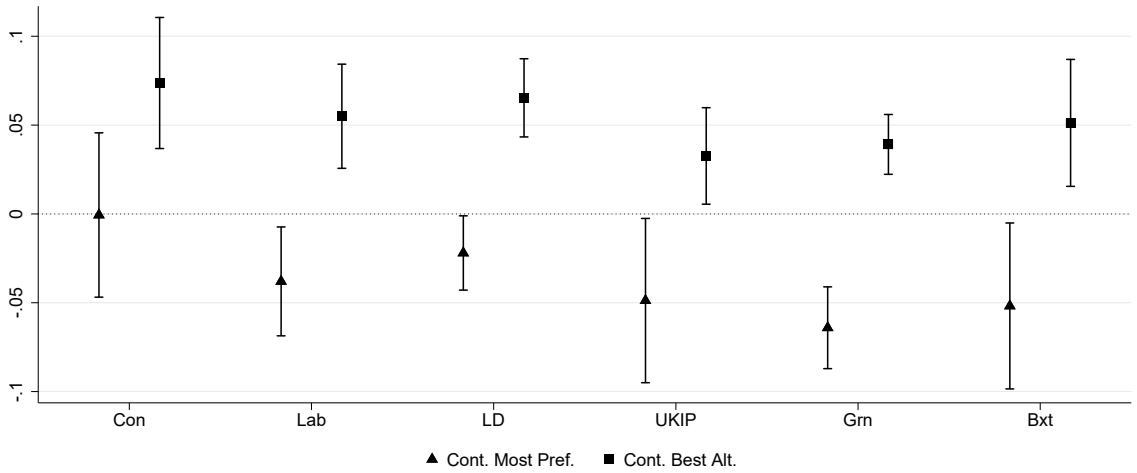
Figure D2 shows the impact of contact by the Most Preferred and Best Alternative parties on the probability of casting a tactical vote for voters with different Most Preferred parties. These estimates are obtained from a model like equation 3, but where the contact indices are interacted with dummy variables indicating each voter's Most Preferred party.[5] The results show that the impact of party contacts is not driven exclusively by supporters of any one party; instead, supporters of all parties respond to party contacts. There are some differences in the size of effects, however.

The impact of contact by the Most Preferred party on the probability of casting a tactical vote is typically smaller among supporters of the three long-established parties, Conservatives (0.1%, not significant), Labour (3.8%), and Liberal-Democrats (2.2%) than for the newer, less-established parties, UKIP (4.9%), Greens (6.4%), and Brexit (5.2%). Simultaneously, the impact of contact by the Best Alternative party is stronger among supporters of the more established parties (7.4% for Conservatives, 5.5% for Labour, and 6.5% for Liberal-Democrats) and weaker

[5] *Please note that the results do not include the SNP, as there are almost no voters who preferred this party and had a positive incentive to cast a tactical vote for another party. Results for PC are not included as the standard errors are very large (and the results not significant) mainly due to small sample sizes.*

among supporters of the newer, less-established parties (3.3% for UKIP, 3.9% for Greens, and 5.1% for Brexit).

Figure D2: Heterogeneous Effects by Most Preferred Party



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level. Results for SNP and PC are not included due to limited data.

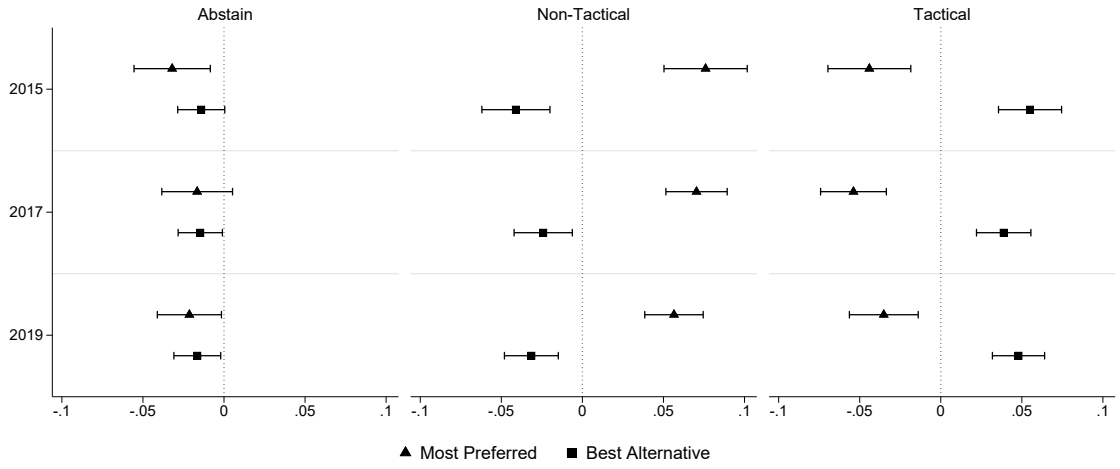
It is not clear why these differences between the more established and less established parties exist. One possibility is that voters who are supporters of the less established parties are less responsive to contact by their Best Alternative party simply because they are already more likely to cast a tactical vote. This may be due to the fact that these parties rarely, if ever, win seats in Parliament. However, it is not possible to test this with the currently available data, as it requires more long term trends and reasons behind belief formation that are outside of the scope of this article.

D.3 Heterogeneous Effects by Election Year

Figure D3 shows how the impact of party contact varies by election year. These results are obtained from a model similar to equation 3 that includes interactions between the contact indices and the election year. Despite the electoral environment being quite different across the three General Elections considered here, the impact of party contact on voter behavior is fairly

similar. None of the differences in effect sizes are statistically different by year.

Figure D3: Heterogeneous Effects by Year



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

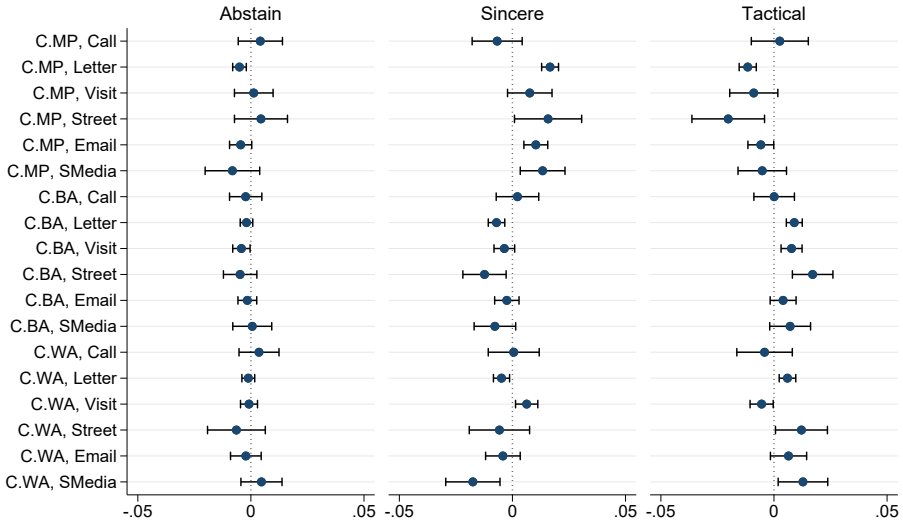
D.4 Heterogeneous Effects by Contact Mode

The main independent variables used in the article are indices that count the number of modes in which a particular voter was contacted by a party. Figure D4 presents the average partial effects from a model that instead uses dummy indicator variables of of the Most Preferred, Best Alternative, and Worst Alternative parties for each of the 6 modes of contact considered in this article: phone call, letter, home visit, street canvassing, email, and social media.

Overall, the estimates presented in Figure D4 show a similar picture to the main results in Figure 3 (which used the contact indices). Contact by the Most Preferred party increases the probability of a sincere vote, which is consistent with H1. This effect is significant at the 5% for letters/leaflets, street canvassing, and email; and at the 10% level for home canvassing visits (not significant for phone calls or social media).[6] In terms of the impact of contacts by the Best Alternative party, most modes of contact show results consistent with H2; that is,

[6] *The non-significant result for phone calls is likely due to the relatively small number of voters in the sample that report being contacted in this manner.*

Figure D4: Heterogeneous Effects by Contact Modes



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

contacts lead to a higher probability of a tactical vote and a lower probability of a sincere vote. Similar to the Most Preferred party, contacts conducted by phone calls have no statistically significant effect, and those from email and social media are only statistically significant at the 10% level. In terms of the impact of contacts by the Worst Alternative party, three modes of contact show statistically significant effects (letter/leftlets, street canvassing, and social media) consistent with H3[7], while home canvassing visits show contradictory results.

Overall, it is hard to discern specific patterns when comparing the different modes of contact, partly due to the fact that for many of them there is a high level of uncertainty. That said, there are a few observations worth making. First, phone calls do not seem to have any impact on voters' decisions. It is likely this null impact is the result of the relatively few phone contacts reported by respondents in the sample. Second, contacts by mail seem to be stronger than other modes (although tests comparing coefficients do not find statistically significant differences due to high uncertainty in most of them). Additionally, the effects of contact by mail are the ones with the highest precision, likely a reflection of it being the more common mode of contact

[7] *Email communication is also consistent, but only significant at the 10% level.*

voters report experiencing.

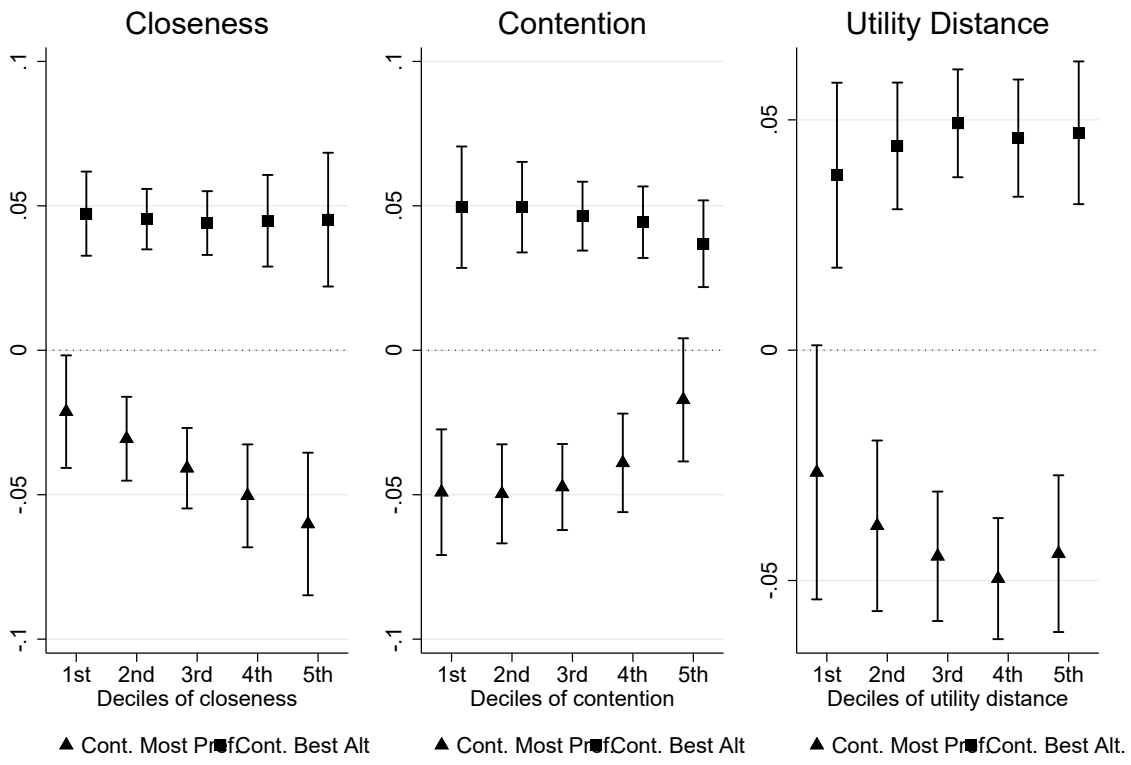
D.5 Disaggregation of the Tactical Incentives Measure

The results in this subsection consider how the impact of party contacts on tactical voting varies with the strength of tactical incentives, disaggregated for three factors that influence this measure: the closeness of the race between the viable parties (sometimes called marginality), the distance from contention of the Most Preferred party, and the utility distance between the (viable) Best and Worst Alternative parties.

Figure D5 presents the average partial effects from a similar model to that used for Figure 4, but interacting the contact indices with the closeness, contention, and utility distance variables (instead of overall tactical incentives). The results are calculated for quintiles of these variables. The effect of contact by the Most Preferred party increases with electoral closeness and decreases with distance to contention, both of which are consistent with H4a: the stronger the incentives, the weaker the impact of party contacts. The effect of contact by the Best Alternative party, on the other hand, does not show any statistically significant patterns depending on closeness or contention. Finally, the effects of contact by the Most Preferred and Best Alternative parties increase with the utility distance between the viable parties (consistent with H4a), but these differences in effects are not statistically significant.

Similar to the results presented in Figure 4, those presented here are only partially consistent with H4a: while the effect of contact by the Most Preferred party increases with the strength of the tactical incentives (at least for closeness and contention), there is no evidence of heterogeneous effects for contact by the Best Alternative party. Additionally, based on the weaker (and non-significant) results for utility distance, the variation in effect sizes for the Most Preferred party is predominantly explained by the electoral circumstances in a constituency (voter pivotality), rather than by voter preferences.

Figure D5: Contact Effects by Tactical Incentive Factors



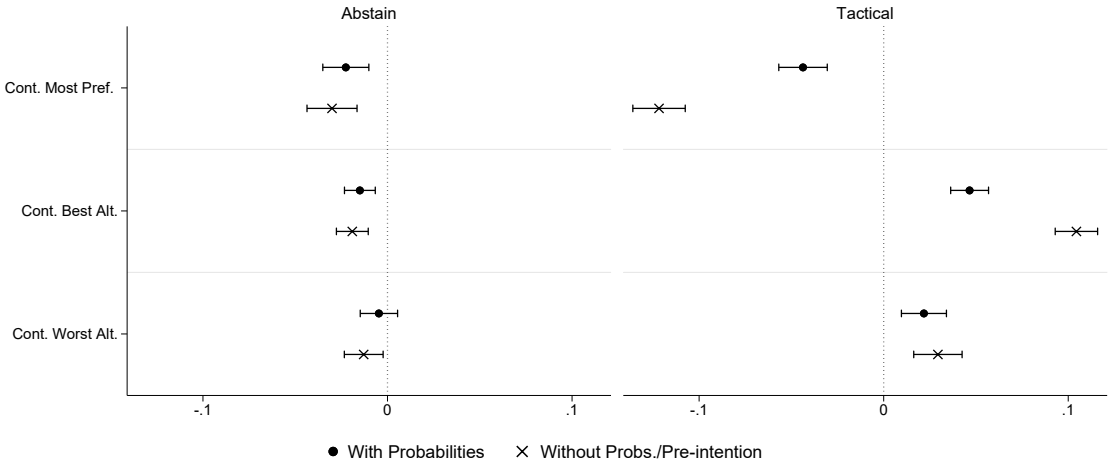
Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

D.6 Overestimation

As argued in the introduction and the Section 3 a significant concern, that this paper addresses, is endogeneity in party contacts. But, to what extent does ignoring the potential sources of endogeneity (including strategic behavior by parties) lead to overestimation of the effect of party contacts?

Figure D6 shows estimates from two versions of the model in equation 3. The first is the main model that includes the predicted probabilities of contact and pre-election vote intention (and constituency-level campaign spending) that was already presented in Figure 3. The second uses the same model as in equation 3, but does not include the predicted probabilities of contact nor pre-election vote intention as control variables (all other control variables are the same). Comparison of the estimates of average partial effects from both models show that there is fairly

Figure D6: Overestimation when not Controlling for Predicted Probabilities



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

little overestimation in terms the impact of party contacts on the probability of abstention. However, there is substantial overestimation of the impact of contact by the Most Preferred and Best Alternative parties on the probability that voters cast tactical vote. For example, the impact of contact by the Most Preferred party on tactical voting is about 2.5 times larger (overestimated) when these potential sources of endogeneity are not accounted for; whereas the impact of contact by the Best Alternative party is slightly over 2 times larger (overestimated).

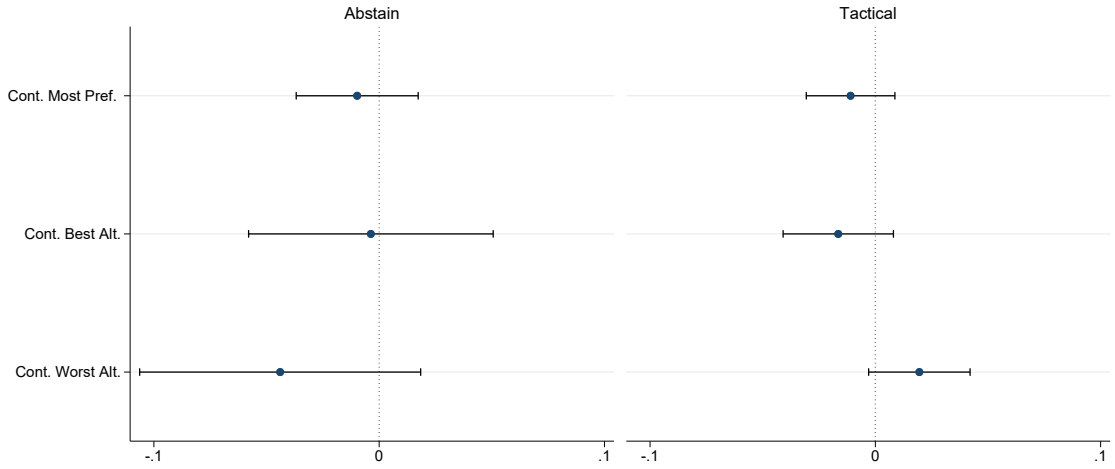
D.7 Placebo: Effect on Voters without Tactical Incentive

The argument in this article is that party contacts alter the probability that a voter casts a tactical vote versus a sincere one. Naturally, it thus focuses on voters with a positive incentive to cast a tactical vote. Voters *without* an incentive to cast a tactical vote, then, should not behave more nor less sincerely when contacted by their Most Preferred, Best Alternative, and Worst Alternative parties. This appendix tests this proposition and, as such, it serves as a placebo test on the main estimates presented in Figure 3.

Figure D7 shows that contact by the Most Preferred, Best Alternative, and Worst Alternative parties do not encourage nor discourage tactical voting behavior among voters *with no incentive*

to cast a tactical vote. Thus, these results provide a higher confidence that the results presented in the main text are indeed measuring how party contacts induce tactical/sincere behavior in voters, rather than conflating them with other potential effects of party contacts (like changes in voter preferences).

Figure D7: Placebo: Average Partial Effect of Party Contacts on Voters with $\tau < 0$



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

A potential concern with the placebo presented in Figure D7 is that contact may not have an impact on tactical behavior among those without an incentive to behave tactically simply because the effect of contact on preferences (party evaluations) may be stronger when incentives are positive than when incentives are negative. However, Figure D8 shows that this is unlikely to be the case.

The estimates in the first column of Figure D8 come from linear regression models in which the outcome is the feeling thermometer for a party. The independent variables include the contact indices for the party, the predicted contact probabilities, party spending at the constituency level, dummies for pre-election intention to abstain and vote tactically, political attention, and the demographic variables used in the main model. Additionally, this model includes a dummy variable for positive (versus negative) tactical voting incentives, and an interaction term between this dummy variable and the contact indices. This interaction term captures how the

effect of contact on feeling thermometers differs between voters with positive and negative tactical incentives, and it is the coefficient included in the figure. The second column comes from identical models but where the outcome is the change in the feeling thermometers between the pre-election and the post-election wave.

When focusing on the Most Preferred and Best Alternative parties, the results in Figure D8 show that the way that contact by a party influences voters' feelings towards that party does not differ between voters with positive and negative tactical incentives. That is, there is no statistically significant evidence that parties are more or less effective at altering voters' preferences when voters have incentives to behave tactically. This is the case when focusing on feeling thermometer levels or on changes in feeling thermometers. For the Worst Alternative party, however, there is some evidence that contact by this party is more effective in altering voters' feelings towards the party when voters have a negative tactical incentive based on feeling thermometer levels, but not on thermometer change (although it is significant at the 10% level).

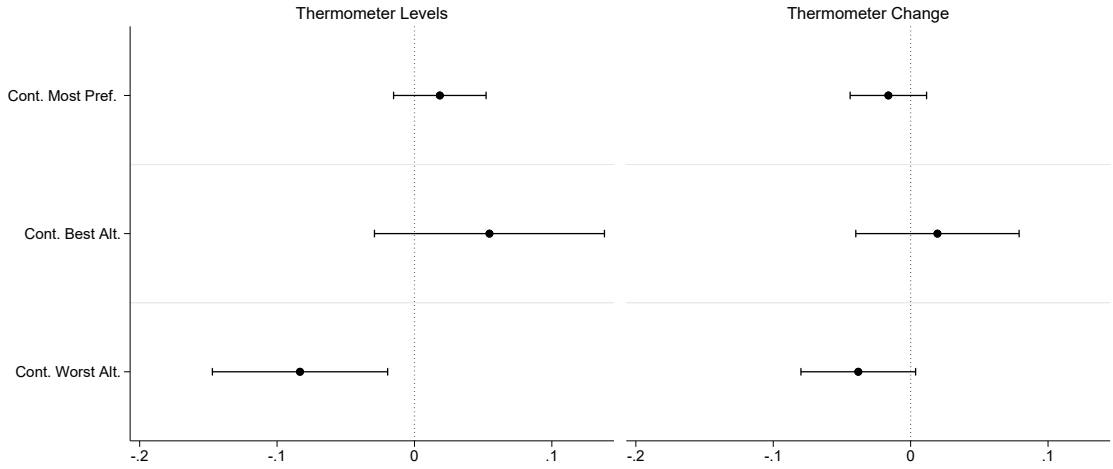
Overall, the results in Figure D8 suggest that the difference in findings between the main effects in Figure 3 and the placebo in Figure D7 cannot be explained by differences in the effectiveness that party contacts have in altering voters' feelings towards the parties among voters with and without incentives to cast a tactical vote. The only potential caveat is the case of the Worst Alternative party. But even in that case, the evidence is mixed.

E Alternative Estimation Techniques

This appendix replicates the main results using two estimation techniques that also aim to control from parties' strategic outreach behavior.

The first alternative technique is to use all three waves for each election and include fixed effects for each individual voter. This fixed effects model also focuses exclusively on voters with an incentive to cast a tactical vote ($\tau > 0$). Thus, the fixed effects model estimates the following

Figure D8: Heterogeneous Impact of Party Contacts on Feeling Thermometers: $\tau > 0$ vs. $\tau \leq 0$.



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

equation:

$$P(y_{it} = k) = \Lambda(\alpha_{ik} + \alpha_k + \beta_{k1} ContMP_{it} + \beta_{k2} ContBA_{it} + \beta_{k3} ContWA_{it} + \gamma_k Controls_{it}) \quad (5)$$

where y_{it} is a categorical variable for individual i in wave t that indicates whether i intends to abstain ($k = 0$), cast a sincere vote ($k = 1$), or cast a tactical one ($k = 2$).[8] $ContMP_{it}$, $ContBA_{it}$, and $ContWA_{it}$ are contact indices by i's Most Preferred, Best Alternative, and Worst Alternative parties during the four weeks prior to wave t; α_k is a choice-specific intercept; and α_{ik} are choice-specific individual-level fixed effects. $Controls_{it}$ are a set of time-varying control variables, which include feeling thermometers for each of the parties, as well as a measure of political attention. This model does not include control variables for any demographic characteristics, constituency-level election results, nor constituency-level campaign spending since these do not vary over time and are therefore captured by the fixed effects (α_{ik}).[9] Finally, $\Lambda(\cdot)$ is the logistic link function.

[8] *For the election wave, y_{it} is reported behavior, rather than intended behavior, as wave $t = 3$, is a post-election survey in each cycle.*

[9] *While constituency-level spending varies over time, the campaign spending figures reported by The Electoral Commission are only available for the entire campaign.*

The second alternative technique is similar to the main model described in equation 3, but instead of controlling for the predicted probabilities derived from equation 1, it directly controls for contacts that occurred in the previous survey wave; that is, it uses the lagged contact variables. The rest of the model is identical to that of the main model.

Both of these alternative estimation techniques are feasible. Given that parties' contact behavior is stable over time (see Appendix B) and that it is unlikely that voters will have dramatic changes in their general views within an election campaign, thinking of the endogeneity problem as time-invariant unobserved heterogeneity is reasonable. As such, the fixed effects model can control for this endogeneity problem. There are, however, a few potential problems in using fixed effects. First, non-linear models with fixed effects, like the one used here, suffer from the incidental parameters problem due to the limited number of time periods for each election (see Neyman and Scott, 1948; Coupe, 2005). This introduces bias in parameter estimates. This bias is typically much less severe in estimates of average partial effects, the main quantity of interest in this article, so it may not be severe. Second, fixed effects models only use units (voters) with variation in the outcome over time, with the rest discarded. This can introduce a form of sample selection bias: voters who change their decision from wave to wave are different than those that remain steadfast in their choices. This sample selection bias can translate into bias in the main estimates if the impact of party contacts differs substantially between the aforementioned two groups of voters (Beck, 2018, 2020). Third, and related to this, the fixed effects may absorb a very significant portion of cross-sectional variation leading to high uncertainty in the estimates, beyond what is needed to control for heterogeneity (Beck and Katz, 2001). These three potential problems are the reason for preferring the predicted probabilities approach to the fixed effects approach.

Using the same argument as for fixed effects models, the lagged contact variables are also a reasonable way of controlling for the endogeneity problem: past contact should reflect that parties were intent in interacting with the voter. The challenge in this case is a practical rather than theoretical one. Contacts in the pre-election waves are sparser than for the election wave

in each cycle (as parties ramp-up their efforts closer to election day). As such, it is likely that parties may intend to contact a certain voter but haven't yet done so. Therefore, the lagged contact variable as a proxy for parties' intent to contact certain voters will have many "false negatives": voters the party wishes to contact (and may indeed contact in the election wave of the campaign), but has not yet done so. If this is the case, we should expect the lagged contact variables to not fully capture the endogeneity. The strategy I use in the main text, which relies on predicted probabilities of contact estimated from past party behavior has the advantage of avoiding the 'false negatives' problem. If a party contacted a voter that is similar to another voter in the same constituency in a prior wave, the predicted probabilities approach used in the main text will consider both of these voters to be potential targets of the party, which is likely to be the case.

Figure E1 presents estimates from the main model, the fixed effects approach, and the lagged contact approach. All three models produce fairly comparable results, although the estimates from the fixed effects model tend to be larger, especially for contact by the Most Preferred party. This suggests that either the different sources of potential bias in the fixed effect model do not materialize strongly in this particular application, or that the different sources of bias operate in different directions and compensate each other.

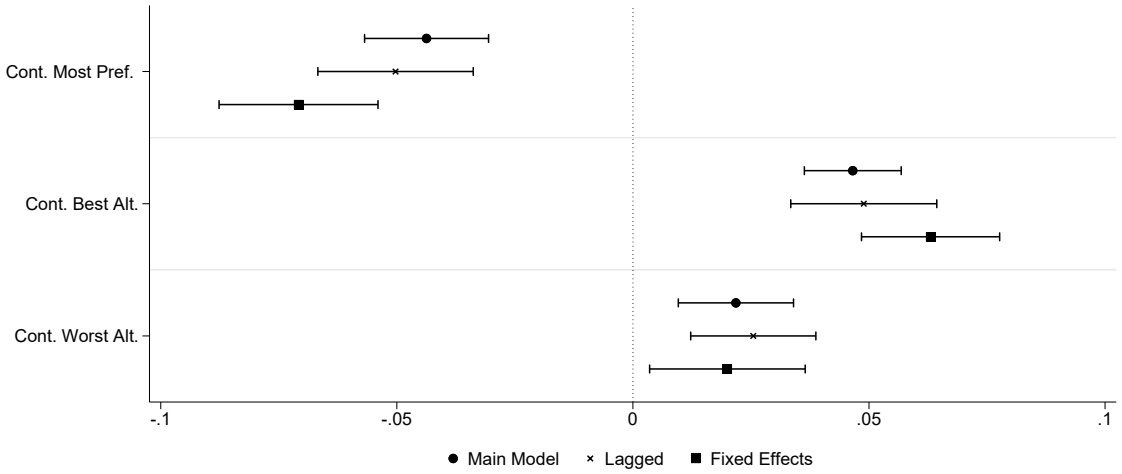
F Alternative Implementations of Tactical Incentives

F.1 Ideological Closeness for Utilities

As an alternative measure for utilities I consider the ideological closeness of respondents to the different parties, with ties broken by the feeling thermometers for each party, and by party identification if necessary.

Ideological closeness to each party is calculated from voters' ideological self-placement and their perceptions of each of the parties' ideological placements. These variables are measured on a scale from 1 to 10 in the BES data, with 1 representing very left-wing and 10 representing

Figure E1: Alternative Estimators



Confidence intervals are at the 95% level. Standard errors are clustered at the constituency level.

very right-wing. From those variables, ideological closeness is defined in the following way:

$$close_i^p = 10 - |self_i - ideo_i^p|$$

where $close_i^p$ is the ideological closeness of respondent i to party p, $self_i$ is the ideological self-placement of respondent i, and $ideo_i^p$ is the ideological placement that respondent i assigned to party p.

Based on this alternative measure of preferences, there is a substantially larger proportion of voters for whom casting a tactical vote is optimal: about 43% to 47%, compared to about 30% to 37% when when using feeling thermometers. Additionally, over 50% of those voters behave tactically based on ideological closeness.

F.2 Subjective Probabilities to Measure Pivotality

As an alternative to the 'objective' winning probabilities used in the main text, I rely on 'subjective' winning probabilities reported by voters. BES respondents are asked to indicate the winning probability for each party in their constituency. I standardize these reported winning

probabilities so that they add up to 1. From these probabilities I derive the pivotal probabilities needed for the measure of tactical incentives following a two step process: (1) I infer voteshares for each party consistent with the reported winning probabilities by each individual voter, and (2) I obtain pivotal probabilities from those inferred voteshares.

For the first step of the process, I assume that the winning probabilities reported by each voter come from a Dirichlet distribution with parameter vector sv_i, where v_i corresponds to a (inferred) vector of voteshares for each party from the perspective of voter i, and s is a measure of the precision of voters' perceptions. Since this calculation relies on the same distributional assumption as the 'objective' pivotal probabilities calculated in the main text, I use the same precision value. Thus:

$$p_i = dDir(sv_i) \tag{6}$$

where $p_i(j),\ j = 1, ..., k$ is the probability that party j will win according to voter i.

Based on this probability function, I solve for v_i numerically, which I call the 'inferred vector of voteshares' based on the 'subjective' winning probabilities reported each voter, i.

The second step, obtaining the pivotal probabilities, is identical to that used in the main text using instead the inferred voteshares for each individual voter. The remainder of the analysis is otherwise identical to that of the main text, also using feeling thermometers as a measure of voter utilities.

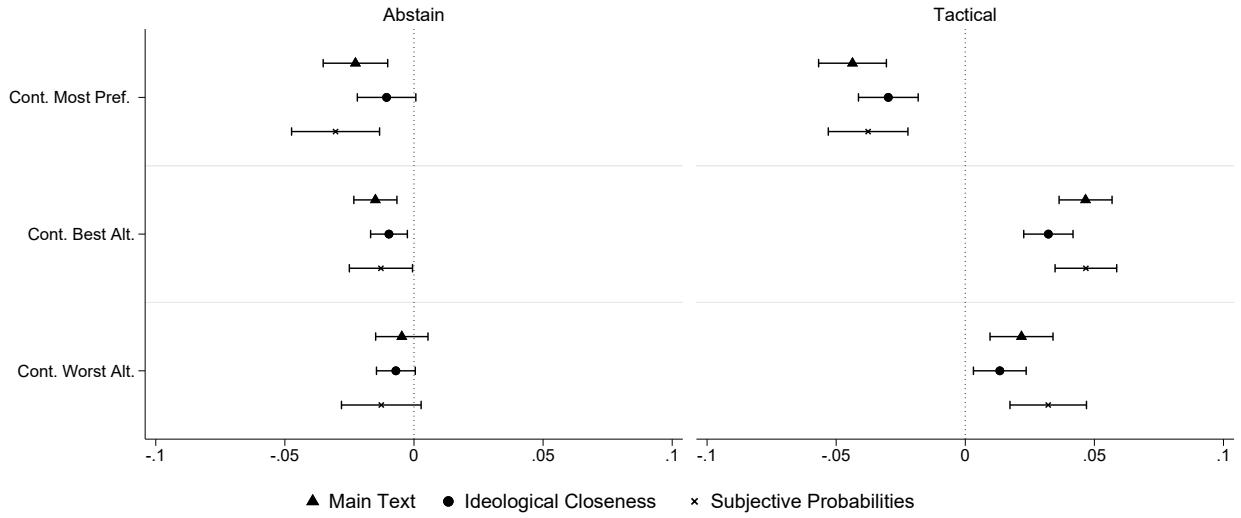
Based on this measure of pivotality, there is a smaller proportion of voters for whom a tactical vote is optimal, ranging from 24% to 33%, depending on the election. The proportion of voters behaving tactically (among those from whom it is optimal) is not substantially different when using 'subjective' or 'objective' pivotal probabilities.

F.3 Results & Discussion of Alternative Incentives Measures

Figure F1 presents the average partial effects of party contacts from the model in equation 3 using the original measure of tactical incentives ('Main Text'), the measure relying on ideological closeness ('Ideological Closeness'), and the measure relying on subjective pivotal probabilities

('Subjective Probabilities'). Broadly speaking, both sets of results relying on alternative implementations of the measure of tactical incentives produce comparable results to those in the main text. The measure relying on subjective probabilities shows effect sizes that are very close to those in the main text (although there are fewer voters for whom voting tactically is optimal, see above). The results relying on ideological closeness show smaller effects of party contacts on tactical behavior (although under this definition there are more voters for whom voting tactically is optimal, and more voters who do so).

Figure F1: Average Partial Effects of Party Contacts with Alternative Measures of Incentives



Overall, the alternative measures of utilities and pivotal probabilities produce results that are qualitatively similar to those in the main text, with some differences in effect sizes. The more noticeable differences are in the proportion of voters who would benefit from casting a tactical vote and, to a lesser extent, on the proportion of voters casting it. However, in terms of the effects of party contacts on the probability of casting a tactical vote, the three sets of results are strongly consistent with each other.

The preference for feeling thermometers as the main implementation of utilities is twofold: first, they are more comprehensive since they can capture both ideological and valence

considerations; second, ratings of different parties are directly comparable.[10]

The preference for using 'objective' probabilities stems from the interest in measuring actual tactical voting behavior, rather than what voters may interpret to be tactical. Additionally, relying on subjective probabilities presents several challenges. The most important one is that voters' probability assessments rarely follow the rules of probability, like adding up to 1.[11] Despite these challenges, 'subjective' probabilities, however flawed our measure of them, are interesting in their own right, especially since they do not always align with 'objective' measures of probability.[12]

[10] *Direct comparison of ideological closeness requires assuming that voters perceive distances equally in both directions. However, this may not be true for many voters. A slightly right-wing voter may be ideologically closer to a moderate left-wing party than to a solidly right-wing one. However, she might still prefer the solidly right-wing one because they are on the ''same side' or because it might move policy in her preferred direction or because the moderate left-wing one has low valence.*

[11] *In fact, more often than not, the sum of winning probabilities reported by each voter add to substantially more than one.*

[12] *In fact, Heath and Ziegfeld (2022) show that in the case of India, voters' very severely overestimate the viability of their most preferred party, to the point where a tactical vote almost never makes sense. However, voters' assessments in UK elections are likely substantially better, but of course not perfect. Raymond (2018) shows that in the case of Canada, voter assessments of the viability of third or lower ranked parties are in fact, to a large degree, reasonable.*