The Revelation Incentive for Issue Engagement in Campaigns

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Abstract

Although parties focus disproportionately on favourable issues in their election campaigns, it is also the case that parties spend much of the 'short campaign' addressing the same issues – and especially salient issues. This is surprising from the perspective of the theoretical literature, which has focused on parties' incentives to campaign on 'owned issues' in order to increase the importance voters attach to these issues. We explain this behaviour by proposing that parties face an additional incentive to address issues that are salient to voters: the need to reveal their positions on these issues to sympathetic voters. We formalise this argument using a model of party strategy with endogenous issue salience.

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1 Introduction

A vast body of work on what might variously be described as 'heresthetics', 'issue competition', 'saliency theory' or 'issue ownership theory' has argued that parties primarily compete by drawing voters' attention to particular issues, in an effort to alter the dimensions on which they are evaluated.[1] This line of research argues that parties typically "talk past each other", with each party focusing on the issues on which it is advantaged in order to increase the salience of these issues to voters. To date, researchers have amassed considerable evidence from a wide range of countries that parties do focus disproportionately on issues that favour them.[2] However, the incentives described in these studies cannot entirely explain issue selection by parties in campaigns. In particular, contrary to the expectations of saliency or ownership theory, it is well-established that parties actually spend much of their campaigns focusing on the same issues as each other – and, in particular, on issues which are already salient to voters.[3] As noted by Sigelman and Buell (2004), there is "no shortage of explanations for why issue convergence is such a rare commodity in American campaigns. Perhaps surprisingly, though, there is a shortage of convincing evidence that issue convergence really is a rare commodity (p. 651)."

We propose a unified explanation for why parties tend to disproportionately focus on issues that favour them, while also spending much of their campaigns discussing the same issues as each other, especially when these issues are particularly salient to voters. We suggest that the extent to which a party emphasizes an issue can have two effects on voters: it may influence the salience of the issue for voters, but it may also influence voters' certainty regarding the party's position on the issue. Based on this observation, we propose one reason parties may choose to engage with voters on issues where their position is unpopular with a majority of voters: revealing their position on such issues for the benefit of potentially sympathetic voters. It is of critical importance for a party to inform these voters about its positions on salient issues, because voters may be wary of casting ballots for the party when they do not know its stance on such issues.[4] We suggest that this 'revelation incentive' to discuss already salient

1. Prominent examples of this work include Budge and Farlie (1983), Riker (1993), and Petrocik (1996). Relatedly, a large empirical and experimental literature on the importance of "priming effects" argues that political advertising has a significant effect on voters' issue priorities (Iyengar and Kinder 1987; Krosnick and Kinder 1990).

2. For instance, Green and Hobolt (2008) observe that during the 2005 British elections, both Labour and the Conservatives campaigned predominantly on their respective 'owned' issues. Other studies with similar findings for other countries include Druckman, Jacobs, and Ostermeier (2004), Green-Pedersen and Mortensen (2010), Vavreck (2009), and Sio and Weber (2014).

3. This has been particularly noted in U.S. presidential and congressional campaigns (Aldrich and Griffin 2003; Sigelman and Buell 2004; Kaplan, Park, and Ridout 2006; Sides 2006), but has also been observed in multiparty contexts like Austria and Denmark (Green-Pedersen and Mortensen 2010; Meyer and Wagner 2015). For instance, when analysing presidential campaigns in the U.S., Sigelman and Buell (2004) found that both candidates spoke on the same issue, on average, a staggering 73% of the time.

4. This account is consistent with a sizable literature arguing that the more uncertain a voter is about candi-

issues coexists and competes with parties' more studied incentive to address and emphasize the issues on which their policy positions are popular. We contend that the combined effect of these incentives may explain why we observe parties directing voters' attention to issues where their positions are more popular, while simultaneously being compelled to emphasize issues on which voters' attention is already focused.

Using a formal model, we show that incorporation of this 'revelation' incentive into a model of party strategy with endogenous issue salience can explain why parties may campaign on unfavourable issues, and especially when these issues are salient to voters. In our model, parties take distinct policy positions on two issues and strategically choose which issues to emphasize in order to maximise their vote share. There are two reasons for a party to emphasize an issue. First, emphasising an issue increases the proportion of voters that considers the issue important, which may be advantageous to a party if its position on the issue is relatively popular. Second, there is the 'revelation incentive'. That is, emphasising an issue increases the proportion of voters that are aware of the party's position on the issue. This benefits the party electorally because voters are less inclined to support a party if they do not know its position on a salient issue. We, show that, under some restrictions on the parameters, the revelation incentive is sufficiently powerful that both parties choose to emphasize both issues in equilibrium. Nevertheless, parties tend to emphasize more salient issues relatively more and also emphasize issues on which they are advantaged relatively more. If one issue is much more salient than the other, then both parties may primarily emphasize this issue in equilibrium, even if one party has a relatively unpopular position on the issue.

While voters' dislike of uncertainty may provide a revelation incentive for parties to emphasize issues in campaigns, casual observation of contemporary politics, as well as prior empirical research on party position taking, suggests that parties do not always try to minimize voter uncertainty by committing themselves to very precise stances on issues. Rather, parties frequently seem to use imprecise language or to tailor their messaging to different audiences – even on issues central to their campaigns. Indeed, many studies have demonstrated that this approach may even be electorally beneficial for parties (Tomz and Houweling 2009; Rovny 2012; Somer-Topcu 2015). In order to account for such strategic behavior by parties, we introduce an extension of our model, in which we allow parties to choose how precise they want to be about their position on an issue in campaigns, in addition to how much to emphasize each issue in campaigns. We assume that parties' face an additional tradeoff in making this choice. The more precisely they indicate a position on an issue, the less uncertain voters are about

date positions, the less likely she is to support the candidate (Alvarez 1998). For other studies that argue similarly, see Enelow and Hinich (1981), Bartels (1986), and Ezrow, Homola, and Tavits (2014). Our argument that individuals are less inclined to vote for a party if they are uncertain of its position on a salient issue may seem at odds with recent research that, instead, stresses the electoral benefits of positional ambiguity (Tomz and Houweling 2009; Rovny 2012; Somer-Topcu 2015). We address this literature below.

their positions, which is beneficial to parties because voters dislike uncertainty. On the other hand, by being imprecise, parties are more able to mislead voters about their true position on an issue and to appeal to disparate groups of voters. We establish that parties will want to be somewhat imprecise in their campaign messaging, especially if their true position on an issue is unpopular. Nevertheless, we find that parties' decisions of which issues to emphasize show the same qualitative patterns as in our initial model. As such, the extended model is able to account for the same empirical patterns of party emphasis as our initial model.

The results of our model, and its extension, stand in contrast to most of the formal theoretical literature on party campaigns.[5] A general conclusion of this literature is that parties never campaign on the same issue, to any degree, if they are favoured by voters on different issues. Instead, each party campaigns entirely on its 'owned' issue in such cases.[6] The only exception, to our knowledge, is Denter (2017), who presents a model where campaigning on an issue increases a candidate's perceived competence on the issue as well as raising its salience. In accordance with our results, he also finds conditions under which candidates campaign on all issues and finds that both candidates are more likely to discuss an issue if it is more salient to voters. While the mechanism studied by Denter is different from ours, his work also bridges the theoretical and empirical literatures on party strategy by providing an explanation for why parties may campaign on unfavourable, or non-owned, issues.

Within the empirical literature, several alternative hypotheses have been put forward to explain the tendency of parties to focus on the same issues when these are salient. It is has been suggested that parties may not want to ignore issues of public concern that are the subject of extensive media coverage (Ansolabehere and Iyengar 1994; Aldrich and Griffin 2003), as this may relinquish control over the framing of the issue to their opponents or may expose them to attack on the issue (Pfau and Kenski 1990). It has also been proposed that parties may be forced to confront unfavourable but salient issues by their political opponents and by the media. However, these studies do not attempt to build a complete theory of when, and why, these incentives may outweigh a party's desire to focus on favourable issues in order to increase the salience of these issues. An important exception is Minozzi (2014), who argues that disadvantaged parties will choose to campaign on salient issues in order to improve their reputation on such issues. In general, these studies suggest important additional incentives for parties to focus on salient issues, which complement the revelation incentive considered in this paper.

5. Recent examples of this literature include Amorós and Puy (2013), Ascencio and Gibilisco (2015), Aragonês, Castanheira, and Giani (2015), Egorov (2015), and Dragu and Fan (2016).

6. For instance, in the model of Aragonês, Castanheira, and Giani (2015), parties never choose to devote time to more than one issue in their campaigns. Similarly, Dragu and Fan (2016) find that parties never advertise the same issue. Some studies have found parties to campaign on the same issue when parties have roughly equal abilities on both issues (Egorov 2015), when parties share ownership of an issue (Ascencio and Gibilisco 2015), or when one party is favoured on both issues (Amorós and Puy 2013).

The remainder of the paper proceeds as follows. In Section 2, we formally model the implications of the 'revelation incentive' for parties' emphasis strategies. Section 3 explores the extension to the baseline model where parties can additionally choose to send precise or imprecise messages to voters on issues they emphasize. Section 4 concludes.

2 A Model of Party Emphasis Decisions

Voters may be less likely to support a party if uncertain about its position on an issue, and particularly if that issue is electorally salient. Given this, we suggest that parties possess an incentive to address even unfavourable issues in their campaigns in order to reveal their positions on these issues. In this section, we formally explore the implications of this 'revelation incentive' for party strategy using a model of electoral competition with two vote-maximising parties and two issues. We describe party and voter behavior in turn, before discussing their joint implications for the equilibrium party emphasis strategies.

2.1 Parties

There are two parties, indexed by $j \in \{1, 2\}$, which compete for votes over issues X and Y. At the start of play, nature chooses a policy position for each party on each issue.[7] At this stage we make no assumptions about how these issue positions are chosen by nature. The resulting issue positions for each party j on the issues X and Y are denoted (θ_j^X, θ_j^Y). We also use θ to refer to the vector $(\theta_1^X, \theta_1^Y, \theta_2^X, \theta_2^Y)$. We assume that $\theta \in \Theta \subset \mathbf{R}^4$, so that each party's position on each issue is a real number. Each party observes its own position alongside those of its rivals.

Each party campaigns in order to maximise its vote share. Although party positions are set by nature, each party is able to choose how much to emphasize each issue in its election campaign.[8] e_j^K denotes the relative emphasis of party j on issue K in its campaign, where $j \in \{1, 2\}$ and $K \in \{X, Y\}$. We assume that parties' choices must satisfy $e_j^X \geq 0, e_j^Y \geq 0$ and $e_j^X + e_j^Y = 1$. As an example, suppose that party 2 emphasizes issue Y twice as much as issue X in its campaign. Then we would have that $e_2^X = \frac{1}{3}$ and $e_2^Y = \frac{2}{3}$. For each party $j \in 1, 2$, a strategy $s_j \in S_j$ is a function mapping the parties' positions to j's emphasis on each issue. That is, s_j is a function $s_j : \Theta \to [0, 1]^2$. s denotes a strategy profile (s_1, s_2) and $S = S_1 \times S_2$ denotes the set of all permissible strategy profiles.

7. This implies that parties' issue positions are exogenously given, as in previous models of endogenous issue salience (Amorós and Puy 2013; Dragu and Fan 2016).

8. The rationale for this assumption is that party platforms are considerably less flexible than the issues on which they choose to campaign. This may be because of institutional factors anchoring parties to particular policy positions (for instance, links with religious organisations or trade unions), or because parties fear voters might perceive them as "irresponsible' if they were to change position (Downs 1957).

As we discuss in Sections 2.3 and 2.4, the extent to which a party emphasizes each issue has two effects: it influences the salience of issues X and Y for voters, and also influences the probability with which voters observe parties' positions on each issue.

2.2 Voters

There is a continuum of voters. Each voter i has an ideal point on issue X and issue Y given by the vector $(x_i, y_i) \in \mathbf{R}^2$. Voter ideal points are distributed according to the joint cdf F and pdf f. That is, for any $(x, y) \in \mathbf{R}^2$:

$$F(x,y) = \text{Prob}(x_i \leq x, y_i \leq y) \equiv \int_{-\infty}^{x} \int_{-\infty}^{y} f(x_i, y_i) \partial x_i \partial y_i$$

We use F_X, F_Y, f_X, f_Y to denote the cdfs and pdfs of the marginal distributions of F with respect to X and Y. We assume that F is twice continuously differentiable with respect to its arguments.

In addition to differing from one another in their ideal points, voters also vary on how much they care about one issue rather than another. We assume that an exogenous fraction $\overline{\pi}_X \in (0,1)$ of voters strongly care about issue X. We refer to these as "X-focused voters". Likewise, fraction $\overline{\pi}_Y \in (0,1)$ of voters strongly care about issue Y. We refer to these as Y-focused voters. In general, we assume that $\overline{\pi}_X + \overline{\pi}_Y < 1$. Fraction $1 - \overline{\pi}_X - \overline{\pi}_Y$ of voters are impressionable. Impressionable voters do not strongly care about a particular issue at the start of campaigning. Instead, which issue these voters consider more important will depend upon the campaign. The fractions $\overline{\pi}_X, \overline{\pi}_Y$ are exogenous and commonly known to parties and voters. These fractions capture that many voters might, for instance, consider issue X to be much more important than issue Y before campaigning even begins.

2.3 Voter Information

Voters prefer to vote for parties whose policy positions are closer to their ideal points. However, voters do not observe all parties' positions on all issues. In particular, whether a voter i observes parties' positions on an issue depends on whether the voter witnesses parties' campaigns on the issue. This in turn depends upon two things: first, how far the parties emphasize the issue in their campaigns and, second, whether voter i is X-focused, Y-focused or impressionable.

Consider an issue-K-focused voter, for some $K \in \{X, Y\}$. Each K-focused voter witnesses party j's campaign on issue K with probability given by $\eta(e_j^K)$, where $\eta : [0,1] \to [0, \overline{\eta}]$ is a twice continuously differentiable function whose derivatives satisfy $\eta'(e) > 0$ and

$\eta''(e) < 0$ for $e \in [0,1)$. Furthermore, we assume that $\eta(0) = 0$, $\eta(1) = \overline{\eta} \leq \frac{1}{2}$ and $\eta'(1) = 0$.[9] Since K-focused voters are focused on issue K, they are assumed to have zero probability of witnessing parties' campaigns on the other issue. Thus, X-focused voters never pay attention to party campaigns on issue Y, and Y-focused voters never pay attention to party campaigns on issue X. Voters are assumed to have too little time or interest to follow more than one party's campaign on one issue. Therefore, each issue-K-focused voter witnesses exactly one party's campaign on issue K with probability equal to $\eta(e_1^K) + \eta(e_2^K)$ and does not witness either party campaign on either issue otherwise.

Impressionable voters, by contrast, do not initially care about one issue more than another. As such, an impressionable voter i may witness a party's campaign on either issue. The impressionable voter i witnesses party j's campaign on issue $K \in \{X, Y\}$ with probability $\frac{\eta(e_j^K)}{2}$. Like other voters, impressionable voters witness at most one party's campaign on one issue. Therefore, each impressionable voter witnesses exactly one party's campaign on one issue with probability equal to $\sum_{K \in \{X,Y\}} \sum_{j=1}^{2} \frac{\eta(e_j^K)}{2}$ and does not witness either party's campaign on either issue otherwise.

Whether or not a voter witnesses a party's campaign matters because it affects the probability that a voter observes party positions on an issue.[10] If an issue-K-focused voter does not witness either party campaign, then she observes both parties' positions on issue K with probability γ_0, and neither party's position on issue K with probability $1 - \gamma_0$. On the other hand, if she witnesses some party j's campaign on issue K, then she observes that party's position on issue K with probability 1, and observes its opponent's position with probability γ_1. $\gamma_0 \in [0,1)$ and $\gamma_1 \in [0,1)$ are exogenous parameters. Furthermore, we assume that $\frac{1+\gamma_0}{2} > \gamma_1 \geq \gamma_0$, that is, witnessing one party's campaign on issue K makes a voter more likely to observe the opposing party's position on that issue than if she had not observed either campaign – but not by too much.[11] An issue-K-focused voter never observes, or cares much about, parties' positions on the other issue.

Impressionable voters have some probability of observing party positions on either issue. If an impressionable voter witnesses no campaign on either issue, then she observes both parties' positions on issue X with probability $\frac{\gamma_0}{2}$, observes both parties' positions on issue Y

9. Therefore, the more party j emphasizes issue K, the more each K-focused voter is likely to witness its campaign on issue K. If party j does not emphasize issue K at all, then $\eta(e_j^K) = \eta(0) = 0$ and no K-focused voters witness party j's campaign on the issue. If party j talks solely about issue K in its campaign, then $\eta(e_j^K) = \eta(1) = \overline{\eta}$ and fraction $\overline{\eta}$ of K-focused voters witness its campaign on the issue.

10. The sharp distinctions we draw between issue X focused voters, issue Y focused voters and impressionable voters are rather extreme compared to reality, as are the distinctions between witnessing a party's campaign compared to observing its issue positions. In reality, many voters are impressionable to some degree and focused on one or other issue to some degree. However, we found the modeling framework considered here to be much more tractable than alternatives.

11. It is necessary to assume that $\frac{1+\gamma_0}{2} > \gamma_1$ because, otherwise, a party might prefer not to campaign at all in order to avoid revealing its opponent's platform to voters. Since real-world parties do campaign, we consider $\frac{1+\gamma_0}{2} > \gamma_1$ to represent the more intuitive case.

with probability $\frac{\gamma_0}{2}$, and observes no parties' position on either issue with probability $1 - \gamma_0$. If an impressionable voter witnesses a party's campaign on some issue $K \in \{X, Y\}$, then she observes that party's position on that issue with probability 1, and observes the other party's position on that issue with probability γ_1. She does not observe party positions on the other issue.[12]

We assume that a law of large numbers holds, so that, for instance, the total proportion of X-focused voters that see party j's campaign on issue X is equal to $\eta(e_j^X)$. Let ρ_j^{KF} denote the proportion of all voters who are issue K-focused and who observe only party j's position on issue $K \in \{X, Y\}$ and not the other party's position. Let ρ_j^{KI} denote the proportion of all voters who are impressionable and who observe only party j's position on issue $K \in \{X, Y\}$ and not the other party's position. Let ρ_B^{KF} and ρ_B^{KI} denote, respectively, the proportion of K-focused and proportion of impressionable voters that observe both parties' positions on issue K. Finally, let ρ_0 denote the proportion of voters that observe neither party's position on any issue. Observe that no voter observes parties' positions on more than one issue. Then, our assumptions above imply that, for each $j \in \{1, 2\}$ and $K \in \{X, Y\}$:

12. These assumptions can be generalised in several ways without substantially affecting the main qualitative results we find for the model. In particular, the function η could be different for different parties and different for X-focused,Y-focused and impressionable voters. The values of γ_1 and γ_0 could also be different for these different types of voter. Furthermore, we could allow that voters that witness no campaigns have some probability of observing only one party's position on an issue. For ease of exposition, we do not discuss these generalisations here.

$$\rho_j^{KF} = \overline{\pi}_K \eta(e_j^K)(1-\gamma_1) \tag{1}$$

$$\rho_j^{KI} = (1-\overline{\pi}_X-\overline{\pi}_Y)\left(\frac{\eta(e_j^K)(1-\gamma_1)}{2}\right) \tag{2}$$

$$\rho_B^{KF} = \overline{\pi}_K \gamma_1(\eta(e_1^K)+\eta(e_2^K)) + \overline{\pi}_K \gamma_0(1-\eta(e_1^K)-\eta(e_2^K)) \tag{3}$$

$$\begin{aligned}\rho_B^{KI} =& (1-\overline{\pi}_X-\overline{\pi}_Y)\left(\frac{\gamma_1(\eta(e_1^K)+\eta(e_2^K))}{2}\right)\\ &+ (1-\overline{\pi}_X-\overline{\pi}_Y)\left(1-\frac{\sum_{K\in\{X,Y\}}\sum_{j=1}^{2}\eta(e_j^K)}{2}\right)\left(\frac{\gamma_0}{2}\right)\end{aligned} \tag{4}$$

$$\rho_0 = 1-\sum_{K\in\{X,Y\}}\sum_{j=1}^{2}(\rho_j^{KF}+\rho_j^{KI}) - \sum_{K\in\{X,Y\}}(\rho_B^{KF}+\rho_B^{KI}) \tag{5}$$

For convenience, we will use η_j^K to denote $\eta(e_j^K)$.

We assume that whether a voter is X-focused, Y-focused or impressionable is independent of the voter's ideal point. Furthermore, whether a voter observes a party's campaign or position on an issue is also independent of the voter's ideal point. Therefore, the proportion of all voters who have ideal point $x_i \leq x$, and observe only party j's position on issue X, is equal to $(\rho_j^{XF}+\rho_j^{XI})F_X(x)$. Similarly, the proportion of voters who have ideal point $y_i \leq y$, and observe both parties' positions on issue Y, is equal to $(\rho_B^{YF}+\rho_B^{YI})F_Y(y)$.

2.4 Salience and Revelation Effects of Campaigns

This formal framework implies that campaigns may affect the salience of issues for voters, which we term the 'salience effect' of campaigns, and campaigns may also influence the revelation with which voters observe parties' positions on issues salient to them, which we term the 'revelation' effect of campaigns. In this section we show how the strength of these effects can be quantified in our model.

Fractions $\overline{\pi}_X, \overline{\pi}_Y$ capture how salient voters consider one issue relative to the other on average, before election campaigning even begins. For example, if issue X is much more salient before the start of campaigning than issue Y, then many voters will be X-focused, and so $\overline{\pi}_X$ will be large. We will refer to $\overline{\pi}_K$ as the pre-campaign salience of issue K. While issue K-focused voters care much more about issue K, impressionable voters care much more about the issue on which they witness a party's campaign, or the issue on which they observe parties' positions. Impressionable voters who observe no party positions are assumed to not care strongly about either issue, even after the campaign. Let π_K denote the post-campaign salience of issue K. That is, π_K represents the proportion of voters who care about issue K after voters have observed (or not observed) party positions. Then, π_K is given by:

$$\pi_K = \overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^{2} \rho_j^{KI} \tag{6}$$

Here, the first right hand side term is the proportion of K-focused voters, and the other right hand side terms are the proportion of impressionable voters that observe a party's position on issue K. Combining equation (6) with equations (2) and (4), we get:

$$\pi_K = \overline{\pi}_K + (1 - \overline{\pi}_X - \overline{\pi}_Y) \left(\frac{2\gamma_0 + \sum_{j=1}^{2} (2 - \gamma_0)\, \eta_j^K - \gamma_0 \eta_j^{\neg K}}{4} \right) \tag{7}$$

where $\frac{\eta_j^{\neg K}}{2} = \frac{\eta(e_j^{\neg K})}{2} = \frac{\eta(1-e_j^K)}{2}$ denotes the chance of an issue-K-focused voter observing party j's campaign on issue $\neg K$. This equation reveals that party emphasis on an issue in campaigns increases the salience of this issue and reduces the salience of the other issue. If both parties increase their emphasis on issue K, then this will increase π_K. Likewise, if both parties increase their emphasis on issue $\neg K$, then this will reduce π_K. How far parties are able to influence the post-campaign salience of issues depends on the fraction of impressionable voters $(1 - \overline{\pi}_X - \overline{\pi}_Y)$. The larger (smaller) this fraction is, the more (less) sensitive π_K is to parties' campaign emphases, and more (less) π_K might differ from the pre-campaign salience $\overline{\pi}_K$. That is, the salience effect of campaigns is larger when $(1 - \overline{\pi}_X - \overline{\pi}_Y)$ is larger.

However, in addition to affecting the salience of issues, party campaigns also affect the fraction of voters that observe party positions, as discussed in the previous section. Let $\hat{\rho}_j^K$ denote the proportion of the voters who think that issue K is important after the campaign, who also happen to observe (at least) party j's position on issue K. That is, $\hat{\rho}_j^K$ is defined as:

$$\hat{\rho}_j^K = \frac{\rho_j^{KF} + \rho_j^{KI} + \rho_B^{KF} + \rho_B^{KI}}{\pi_K} \tag{8}$$

In the appendix, we prove the following proposition.

Proposition 1. *If* $e_j^K < 1$, *then* $\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} > 0$. *In general,* $\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} \leq \frac{\eta'(e_j^K)(1-\gamma_0)}{\overline{\pi}}$.

Proof. See Appendix A. □

Proposition 1 shows that there is a revelation effect of party campaigns, in addition to the salience effect of campaigns. That is, party campaigns increase the fraction of voters that observe a party's position on an issue – they increase voters' 'revelation' about party positions. Proposition 1 shows that, in general, this revelation effect tends to become small as γ_0 becomes closer to 1, and ultimately disappears when γ_0 approaches 1. This is because, if γ_0 is close to 1, then almost all voters observe a party's position on the issue they care about, regardless of whether or not they witness a campaign, and so parties' campaign emphases have little effect on the fraction of voters that observe their campaigns.[13]

2.5 Vote Choice

Voters gain utility from voting for parties whose positions are close to their ideal points. As noted above, each voter observes parties' positions on at most one issue. We assume that a voter who observes parties' positions on neither issue has no basis for judging which party is closer to the voter's ideal point, and so votes for each party with probability $\frac{1}{2}$. A voter who observes one or more party positions on an issue K makes their vote choice based on this issue alone, since they cannot judge which party is closer to their ideal point on the other issue, and in any case they do not care as much about the other issue, as explained in Section 2.4.

Suppose that a voter i observes one or more party positions on issue X (only). Then voter i's utility from voting for party j is given by $U(|x_i - \theta_j^X|)$ where $U : \mathbf{R}_+ \to \mathbf{R}$ is a strictly decreasing function. Similarly, if voter i observes one or more positions on issue Y, then i's utility for voting for party j is given by $U(|y_i - \theta_j^Y|)$.

If a voter observes both parties' positions on an issue K, then the voter votes for the party whose position gives the voter the highest utility. Let $\psi_j^K \in [0, 1]$ denote the proportion of voters who observe both parties' positions on issue K, who choose to vote for party j. Then, ψ_j^X and ψ_j^Y are given by:

13. The fraction of voters that observe a party's position depends on γ_1 also, but we require that $\gamma_1 \geq \gamma_0$, so the fraction observing party positions must be close to 1 when γ_0 is close to 1.

$$\psi_j^X = \int_{\infty}^{-\infty} \mathbf{1}\{U(|x_i - \theta_j^X|) > U(|x_i - \theta_{\neg j}^X|)\} f_X(x_i)\ \partial x_i$$
$$\equiv \int_{\infty}^{-\infty} \mathbf{1}\{|x_i - \theta_j^X| < |x_i - \theta_{\neg j}^X|\} f_X(x_i)\ \partial x_i \tag{9}$$

$$\psi_j^Y = \int_{\infty}^{-\infty} \mathbf{1}\{U(|y_i - \theta_j^Y|) > U(|y_i - \theta_{\neg j}^Y|)\} f_Y(y_i)\ \partial y_i$$
$$\equiv \int_{\infty}^{-\infty} \mathbf{1}\{|y_i - \theta_j^Y| < |y_i - \theta_{\neg j}^Y|\} f_Y(y_i)\ \partial y_i \tag{10}$$

where $\mathbf{1}\{\cdot\}$ denotes the indicator function.[14]

It remains to determine the behavior of voters who observe only one party's position on an issue. Our baseline assumption is that voters are ambiguity averse (Epstein 1999) and do not know parties' positions unless they observe them in the campaign.[15] In particular, if a voter does not observe a party's position on the issue she cares about, then the voter 'fears the worst': that the party could be extremely distant from the voter in policy terms. Therefore, if a voter observes party j's position on an issue K, but not party $\neg j$'s position on the issue, then the voter will care about issue K and will vote for party j, fearing the worst about party $\neg j$'s position. That is, a voter always chooses to vote for 'the devil they know' rather than for a party whose position is unknown on the issue that the voter considers important.

In Appendix I, we also present results for the model when the assumption that voters are ambiguity averse is replaced with the alternative assumption that voters are expected utility maximisers. That is, they vote for the party that maximises their expected utility, based on their posterior beliefs about party's positions, which are assumed to be Bayesian rational. The case of ambiguity averse voters is considerably more tractable than the case where voters are expected utility maximising. As such, we are only able to obtain numerical solutions in the latter case. Nevertheless, our numerical results presented in Appendix I indicate that equilibrium party emphasis decisions are virtually identical across the two cases for the parameter values we consider, except when party positions are relatively extreme.

Recall that a strategy s_j is a function mapping the parties' positions to j's emphasis on each issue. Let $V_j(\theta, s)$ denote the total vote share of party $j \in \{1, 2\}$, given that parties hold positions given by θ and given the parties' strategies s. Focusing here on the case of ambiguity

14. Since we assume that the cdf F is continuous, we can define ψ_j^X and ψ_j^Y without considering the vote choice of voters whose ideal points are equidistant between the two parties, since the measure of these voters is zero.

15. Implicitly, this also requires that voters do not observe parties' emphases on each issue, since the voter who knew these might be able to infer a party's position from its emphasis choices.

averse voters, our assumptions above imply that $V_j(\theta, s)$ is given by:

$$V_j(\theta, s) = \frac{\rho_0}{2} + \sum_{K \in \{X,Y\}} (\rho_B^{KF} \psi_j^K + \rho_B^{KI} \psi_j^K + \rho_j^{KF} + \rho_j^{KI}) \tag{11}$$

where $\rho_0, \rho_B^{KF}, \rho_B^{KI}, \rho_j^{KF}$ and ρ_j^{KI} are given by equations (1)-(5) and ψ_j^K is given by equations (9) and (10), and where each party's issue emphases e_j^K are understood to depend on s and θ.

2.6 Equilibrium Party Strategies

Focusing on the case of ambiguity averse voters, we define an equilibrium in this model as a strategy profile $s \in S$ such that each party's strategy maximises its vote share for any θ given the other party's strategy. That is, (s_1, s_2) constitutes an equilibrium if for each $\theta \in \Theta$, and for each $j \in \{1, 2\}$, there is no $\tilde{s}_j \in S_j$ satisfying $V(\theta, \tilde{s}_j, s_{\neg j}) > V(\theta, s_j, s_{\neg j})$.[16]

We solve for party j's equilibrium strategy by fixing θ and solving for party j's vote maximising emphasis choices e_j^X, e_j^Y given θ and given $e_{\neg j}^X, e_{\neg j}^Y$. This optimisation problem can be solved by forming the Lagrangian:

$$\mathcal{L}_j = V_j + \lambda_j e_j^X + \mu_j (1 - e_j^X) + \nu_j (1 - e_j^Y - e_j^X)$$

where λ_j, μ_j and ν_j are Lagrange multipliers on the constraints $e_j^X \geq 0, e_j^X \leq 1$ and $e_j^X + e_j^Y = 1$.

V_j is continuously differentiable in the choice variables (e_j^X, e_j^Y). The constraints are all linear and so the constraint qualification is satisfied, which implies that the Kuhn-Tucker first order conditions are necessary for an optimum. The first order conditions for party j can be rearranged to give

$$\frac{\partial V_j}{\partial e_j^X} - \frac{\partial V_j}{\partial e_j^Y} + \lambda_j - \mu_j = 0 \tag{12}$$

where $\lambda_j \geq 0, \mu_j \geq 0$ and $\lambda_j e_j^X = 0$ and $\mu_j (1 - e_j^X) = 0$.

Substituting equations (1)-(5) into equation (11), and differentiating, we obtain the deriva-

16. Given the vote share function (11) and policy position of each party, this corresponds to a subgame perfect Nash equilibrium in pure strategies between the two parties – each party maximises its vote share given the other party's strategy for each θ chosen by nature. At the same time, the behaviour of voters cannot be viewed as part of a subgame perfect Nash equilibrium, since voters are ambiguity averse and so are not acting to maximise expected utility.

tives of V_j with respect to party j's issue emphasis on issue $K \in \{X, Y\}$:

$$\frac{\partial V_j}{\partial e_j^K} = \frac{\eta'(e_j^K)}{4}\Big[(1+\overline{\pi}_K - \overline{\pi}_{\neg K})\left(1-\gamma_0 - 2(1-\psi_j^K)(\gamma_1-\gamma_0)\right) + \gamma_0(\psi_j^K - \psi_j^{\neg K})(1-\overline{\pi}_K - \overline{\pi}_{\neg K})\Big] \tag{13}$$

where $\overline{\pi}_{\neg K}$ denotes the pre-campaign salience of the other issue, issue $\neg K$. Likewise $\psi_j^{\neg K}$ denotes party j's vote share among voters who observe both party positions on issue $\neg K$.

It is immediate from equation (13) that, for each $j = 1, 2$, $\frac{\partial^2 V_j}{\partial e_1^K \partial e_2^K} = 0$. In combination with the first order condition (12), this implies that the optimal emphasis strategy of Party 1, does not depend on Party 2's emphasis strategy. Likewise Party 2's optimal emphasis strategy does not depend on Party 1's strategy. This makes it relatively straightforward to characterise the equilibrium using the first order condition (12) for each party. It emerges that party j maximizes her vote share when

$$\max\left\{0; \frac{\partial V_j}{\partial e_j^X}\right\} = \max\left\{0; \frac{\partial V_j}{\partial e_j^Y}\right\},$$

which is equivalent to $\frac{\partial V_j}{\partial e_j^X} = \frac{\partial V_j}{\partial e_j^Y}$ except when either $\frac{\partial V_j}{\partial e_j^X}, \frac{\partial V_j}{\partial e_j^Y} < 0$. Intuitively, this states that in equilibrium, parties will equalize the marginal electoral gains from emphasizing each issue. The formal characterization of the equilibrium is given by the following two results, for which detailed proofs are given in the appendix. In these results, it is convenient to write $\frac{\partial V_j}{\partial e_j^K}$ as $\frac{q^K \eta'(e^\star)}{4}$.

Lemma 1. *Consider any $K \in \{X, Y\}, \overline{\pi}_X \in (0,1), \overline{\pi}_Y \in (0, 1-\overline{\pi}_X), \gamma_0 \in [0,1), \gamma_1 \in [\gamma_0, \frac{1+\gamma_0}{2}), \psi_j^X \in [0,1], \psi_j^Y \in [0,1]$. Let*

$$q^K = \max\Big[0; (1+\overline{\pi}_K - \overline{\pi}_{\neg K})\left(1-\gamma_0 - 2(1-\psi_j^K)(\gamma_1-\gamma_0)\right) + \gamma_0(\psi_j^K - \psi_j^{\neg K})(1-\overline{\pi}_K - \overline{\pi}_{\neg K})\Big] \tag{14}$$

Then $q^K + q^{\neg K} > 0$ and there exists a unique solution $e^\star \in [0,1]$ to the equation:

$$q^K \eta'(e^\star) - q^{\neg K}\eta'(1-e^\star) = 0 \tag{15}$$

Proof. See Appendix B. □

Proposition 2. *There exists a unique equilibrium of the model for all parameter values. In the equilibrium, party j's emphasis on issue $K \in \{X, Y\}$, for each $\theta \in \Theta$, is given by $e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$, where $\psi_j^K, \psi_j^{\neg K}$ depend on θ, and where*

$e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$ *denotes the solution* $e^\star$ *to equation* (15)*, given* $\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y$.

Proof. See Appendix C. □

Proposition 2 and Lemma 1 provide a complete characterization of the equilibrium of the model.

2.7 Properties of the Equilibrium

Using Proposition 2 and Lemma 1, we now show that that the model has a number of novel implications for party emphasis strategies, which stand in contrast to the results of much of the formal literature.[17] First, we establish conditions under which the revelation incentive is sufficiently strong for both parties to emphasize both issues in equilibrium. Conversely, we show that when the revelation incentive is sufficiently weak, both parties will 'talk past each other' and exclusively emphasize different issues, in accordance with much of the previous formal literature. Next, we derive comparative statics for how the model equilibrium depends upon the values of the parameters. We show that both parties tend to emphasize an issue K more if the number of K-focused voters increases and the number of voters focused on the other issue decreases – in other words, if the initial relative salience of issue K is higher. At the same time, we show a party tends to emphasize an issue relatively more when its position on the issue is relatively more popular. Finally, we show that, if the fraction of issue-K-focused voters is sufficiently close to one, both parties may choose to primarily emphasize issue K in their campaigns regardless of how popular their positions are on the issue. Together, these properties of the model equilibrium can account for the empirical literature's findings on party strategy discussed on page 1: while parties do tend to campaign disproportionately on issues that favor them, they may often find themselves campaigning on the same issues, particularly when these issues are highly salient.

We now derive these formal properties of the equilibrium in turn. First, we to derive conditions under which the revelation incentive is sufficiently strong for both parties to emphasize both issues in equilibrium. Inspecting Lemma 1, it is apparent that if, for some $\theta = \bar{\theta}$ and some party j, it is the case that $q^X > 0$ and $q^Y > 0$ in equation (14), then, since $\eta'(1) = 0$, the solution to equation (15) must involve $e^\star \in (0, 1)$.[18] In that case, Proposition 2 implies that party j will emphasize both issues in equilibrium if party positions are given by $\bar{\theta}$. By similar reasoning, if for some $\theta = \hat{\theta}$, either $q^X = 0$ or $q^Y = 0$ in equation (14), then the

17. That is, in contrast to the results of, for instance, Austen-Smith (1993), Simon (2002), Amorós and Puy (2013), Ascencio and Gibilisco (2015), Aragonês, Castanheira, and Giani (2015), Egorov (2015), and Dragu and Fan (2016).

18. Substituting $q^X > 0$, $q^Y > 0$, and either $e^* = 0$ or $e^* = 1$ into equation (15) immediately reveals a contradiction.

solution to equation (15) must involve $e^\star \in \{0,1\}$, and party j will emphasize only one issue in equilibrium if party positions are given by $\hat{\theta}$.

Therefore, to infer whether or not parties emphasize one or both issues in equilibrium, it is necessary only to identify whether $q^X > 0$ and $q^Y > 0$. After some manipulation of equation (14), we have the following result:

Proposition 3. *Consider any* $j \in \{1,2\}, K \in \{X,Y\}$ *and a vector* $(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$. *If* $\gamma_0 \leq \gamma_1 < \frac{1}{2}$ *then* $e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y) \in (0,1)$. *Conversely, provided* $\psi_j^K > \psi_j^{\neg K}$, *there exists* $\gamma^\star \in \left(\frac{1}{2}, 1\right)$ *such that* $e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \tilde{\gamma_0}, \tilde{\gamma_1}, \psi_j^X, \psi_j^Y) = 1$ *, for all* $\tilde{\gamma_1}, \tilde{\gamma_0}$ *satisfying* $1 \geq \tilde{\gamma_1} \geq \tilde{\gamma_0} \geq \gamma^\star$.

Proof. See Appendix D. □

Proposition 3 establishes that, provided γ_0 and γ_1 are both less than $\frac{1}{2}$, both parties will choose to emphasize both issues to some degree in equilibrium, since each $e_j^K \in (0,1)$ in equilibrium. This is true even if, for instance, Party 1's position on issue X is more popular than Party 2's (i.e. $\psi_1^X > \frac{1}{2}$) and Party 2's position on issue Y is more popular than Party 1's. This contrasts with the results of models in the literature, which do not predict that both parties emphasize both issues when they are advantaged on different issues.[19] The reason that both parties emphasize both issues in our model when γ_0 and γ_1 are not too high is the revelation effect of campaigns. When γ_0 and γ_1 are low, a voter that witnesses a party's campaign is substantially more likely to observe that party's position than a voter that does not witness the party's campaign. This means that if a party increases its emphasis on an issue, the fraction of voters that observe its position on the issue also increases. Since voters are ambiguity averse, voters are more likely to vote for a party if they observe its position on an issue, regardless of what that position is. Therefore, even if a party's position is relatively unpopular on an issue, it may still gain votes by increasing emphasis on that issue, because this increases the probability that voters will observe its position on the issue. Furthermore, since the η function is strictly concave and $\eta'(1) = 0$, emphasizing an issue beyond a certain point hardly increases the fraction of voters that observe a party's position on an issue, and so the marginal gain to a party from emphasizing an issue a very large amount is relatively low. The consequence of this is that parties will tend to prefer to emphasize both issues to some degree, rather than just exclusively emphasizing one issue. Therefore, for sufficiently low γ_0, γ_1, we find that both parties emphasize both issues.

On the other hand, Proposition 3 also shows that, when γ_0 and γ_1 are sufficiently high, party j chooses $e_j^K = 1$ when $\psi_j^K > \psi_j^{\neg K}$. That is, for sufficiently high values of γ_0 and γ_1, Party 1 emphasizes one issue and Party 2 the other issue in equilibrium, except in the

19. To the best of our knowledge, ours is the first model in the literature that predicts that both parties may emphasize both issues when they are advantaged on different issues.

knife-edge case where a party's position is equally popular on both issues. This is similar to other results in the literature. This result arises because high values of γ_0 and γ_1 make the revelation effect of campaigns very weak as shown in Proposition 1. High values of γ_0 imply that voters will observe a party's position regardless of whether or not they witness its campaign, while high values of γ_1 entail that a party's campaign reveals as much about the opposing parties' position as it reveals about the party's own position. Therefore, high values of γ_0 and γ_1 imply that parties gain few votes from the revelation effect of campaigns and so the predominant effect of campaigns on vote share is the salience effect. As with previous models in the literature, the salience effect tends to lead parties to 'talk past each other' – that is, parties campaign exclusively on the issue on which their position is relatively more popular with voters.

We now show how parties emphasis strategies change in the model when the model parameter values and party positions change. Substituting equation (14) into (15) in Lemma 1 and applying the implicit function theorem reveals the following comparative statics:

Proposition 4. *Consider any* $j \in \{1,2\}, K \in \{X,Y\}$ *and a vector* $(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$. *Let* $e_j^{\star K} \equiv e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$ *and suppose that* $e_j^{\star K} \in (0,1)$. *Then* e_j^K *satisfies the following comparative statics:*

$$\frac{\partial e_j^{\star K}}{\partial \psi_j^K} > 0 \tag{16}$$

$$\frac{\partial e_j^{\star K}}{\partial \overline{\pi}_K} - \frac{\partial e_j^{\star K}}{\partial \overline{\pi}_{\neg K}} \geq 0 \tag{17}$$

$$\left(\frac{\partial e_j^{\star K}}{\partial \overline{\pi}_X} + \frac{\partial e_j^{\star K}}{\partial \overline{\pi}_Y}\right)\left(\psi_j^K - \psi_j^{\neg K}\right) \leq 0 \tag{18}$$

Proof. See Appendix E. □

The three comparative statics contained in Proposition 4 are intuitive. The first result (16) arises because, when ψ_j^K is higher, party j's position on issue K is relatively more popular. This encourages party j to increase its emphasis on issue K for two reasons: first, in order to reveal its more popular position to voters, and second, to increase the proportion of impressionable voters who care about issue K. The second result (17) states that when the pre-campaign salience of issue K is higher compared to the other issue—and so $\overline{\pi}_K$ is higher and $\overline{\pi}_{\neg K}$ lower—parties emphasize issue K more. This is because when voters primarily care about issue K, parties can gain more votes by revealing their positions on issue K than on the other issue. Consequently, parties increase their emphasis on issue K. Finally, (18) arises because, if $\overline{\pi}_X$ and $\overline{\pi}_Y$ both increase a similar amount, this represents a decrease in the number of impressionable voters. This means that parties have less ability to influence the salience of issues. This reduces the strength of the salience effect of party campaigns relative to the revelation effect. This in turn reduces each party's incentive to emphasize the issue on which its position is relatively more popular, because it is the salience effect of campaigns that provides the strongest motivation to emphasize such issues. Therefore, if $\psi_j^K > \psi_j^{\neg K}$, and so party j's position on issue K is relatively more popular, it follows that party j's emphasis on issue K falls when $\overline{\pi}_X$ and $\overline{\pi}_Y$ both increase a similar amount, which implies (18).

Finally, we show that if the initial salience of an issue K is sufficiently high, both parties may choose to primarily campaign on this issue regardless of the positions they hold on the issue. Thus, the equilibrium may involve both parties talking mainly about the same issue if it is highly salient.

Proposition 5. *Fix $\gamma_0 \in [0, \frac{1}{2})$ and $\gamma_1 \in [0, \frac{1}{2})$. Then, for any $z \in (0, 1)$, there exists a $\pi^\star \in (0, 1)$ such that, for any $K \in \{X, Y\}$, if $\overline{\pi}_K > \pi^\star$ then in equilibrium both parties j will choose $e_j^K > z$ for all $\theta \in \Theta$.*

Proof. See Appendix F. □

Propositions 3–5 demonstrate some of the qualitative properties of the equilibrium. In Appendix H, we provide a quantitative illustration of the equilibrium by presenting numerical results for the model for various parameter values. Appendix I provides additional numerical results for the case when voters maximize expected utility, instead of being ambiguity averse.

3 Campaigns with Imprecise Messaging

Thus far, we have assumed that voters are ambiguity averse and so less likely to support a party if they do not know its position on the issue most important to them.[20] If this accurately characterizes voter behavior, one might also expect parties, when emphasizing an issue, to be extremely precise in their campaign messages, communicating very specific policy proposals in order to minimize voter uncertainty about their positions. However, this is clearly at odds with many real-world campaigns as well as much research on party position-taking, as parties are known to frequently use imprecise language or to tailor their messaging to different audiences – even on issues central to their campaigns. Indeed, many studies have demonstrated that this approach may even be electorally beneficial for parties (Tomz and Houweling 2009; Rovny 2012; Somer-Topcu 2015).[21]

In this section, we incorporate the possibility that parties may be able to send more or less precise messages in their campaigns. We aim to examine whether and when they might

20. In Appendix I, we instead assume that voters maximize expected utility and are risk averse.

21. Much of this literature refers to this phenomenon as parties taking 'ambiguous positions'. We instead use the term "imprecise messaging" to refer to this behavior, to avoid confusion with the theoretically distinct concept of ambiguity aversion, which is assumed throughout in the model.

choose to send imprecise messages, and how this possibility interacts with their emphasis strategies in a context with ambiguity averse voters and endogenous issue salience. In particular, we now allow parties to have two dimensions of choice on each issue: party j can choose its emphasis $e_j^K \in [0, 1]$ on issue K, and can also choose the precision of its messaging on issue K, which we denote by $r_j^K \in [0, 1]$. If $r_j^K = 1$, the party communicates a very precise position on issue K, whereas if $r_j^K = 0$, the party is maximally vague about its position on issue K. Precision and emphasis are distinct choices: a party may campaign very actively on an issue while communicating very precisely about its position on the issue (i.e. choosing high e_j^K and r_j^K), or it may campaign very actively on an issue while remaining very vague about its position on that issue (high e_j^K, low r_j^K). Likewise, it is possible for a party to make almost no reference to an issue on its campaign, despite stating a precise position on the issue in its manifesto (low e_j^K, high r_j^K), and also possible for a party to ignore an issue in a campaign and never commit to a stance on that issue (low e_j^K, low r_j^K).

In this extension to our baseline model, we assume that the choice of r_j^K involves a tradeoff. First, if parties' campaign messages are less precise, this increases the likelihood that voters will remain completely uncertain about the party's position on the issue important to them, which is electorally costly as voters are ambiguity averse. As such, there is also a revelation incentive for parties to communicate precise positions on issues that they campaign on: imprecise messages are less likely to reveal a party's issue position to voters. However, as is well-documented, there are also electoral benefits associated with imprecision: by communicating imprecisely, parties can mislead voters about their true position; they are also able to communicate slightly different positions to different voters. Consistent with empirical evidence that voters often optimistically perceive 'broadly appealing' parties as ideologically proximate to themselves (Tomz and Houweling 2009; Somer-Topcu 2015), we suggest that sending imprecise messages may allow parties to attract and retain ideologically distinct voters who misperceive the party's policy stances. This enables the party to appeal to voters who would be repelled if they were made aware of the party's true position. We call this the 'projection incentive': by sending imprecise campaign messages, a party can project different positions to voters from the position it actually holds.

We identify conditions under which the tradeoff between the revelation incentive and projection incentive leads parties to choose $r_j^K \in (0, 1)$. Principally, so long as γ_1 is not too high—i.e. the revelation incentive is sufficiently powerful—parties will choose to send somewhat imprecise but not totally imprecise campaign messages. We show that, rather intuitively, parties choose to send less precise campaign messages when their true position would be more unpopular with voters. Moreover, we establish that, so long as the aforementioned conditions are satisfied, all the qualitative results for party emphasis strategy e_j^K from the baseline model are robust to the possibility that parties may be imprecise in their messaging.

3.1 Additional Assumptions

As before, we assume that party positions are exogenous and given by $\theta \in \Theta \subset \mathbf{R}^4$, and that these positions represent the policies that parties would implement if elected. However, we now allow for the possibility that parties can send imprecise campaign messages in order to mislead voters about their true positions. Additionally, each party j now has two choices to make: how much to emphasize each issue K, denoted e_j^K, and the precision of its message on each issue K, denoted r_j^K. Parties are free to choose any $(r_j^K, r_j^{\neg K}) \in [0,1]^2$.[22]

In this extension, the assumptions about voter information differ from the baseline model in two ways. First, we assume that, even if a voter witnesses a party's campaign, she may not comprehend it if the party's messages are too imprecise. Specifically, if a voter witnesses a campaign, she comprehends the party's campaign messages with probability $C(r_j^K)$, where $C : [0,1] \to [0, c_1]$ is a twice continuously differentiable function satisfying $C(0) = 0, C(1) = \overline{C} < 1$, $C'(1) = 0$, and where $C'(r_j^K) > 0$ and $C''(r_j^K) < 0$ for all $r_j^K \in [0,1)$. If a voter does not comprehend a campaign, it is as if she did not witness the campaign. If this occurs, as before, we assume that the voter observes a position for both parties with probability γ_0 and a position for neither party with probability $1 - \gamma_0$. If a voter does comprehend a campaign, then, also as before, she observes a position for that party with probability 1 and a position for the other party with probability γ_1.

The second way the assumptions about voter information differ from the baseline model is that, even if a voter observes a position for a party, she might unknowingly observe the wrong position for that party. In particular, we assume that if a voter witnesses and comprehends party j's campaign, then, as mentioned above, she observes a position for party j with probability 1. However, we now assume that the position she observes is party j's true position with probability $1 - \mathcal{P}(r_j^K)$, and a misleading 'projected' position θ_{ij}^{PK} with probability $\mathcal{P}(r_j^K)$. θ_{ij}^{PK} satisfies:

$$\theta_{ij}^{PX} = \left(1 - \omega_{ij}^X\right) \theta_j^X + \omega_{ij}^X x_i,$$

$$\theta_{ij}^{PY} = \left(1 - \omega_{ij}^Y\right) \theta_j^Y + \omega_{ij}^Y y_i.$$

where the party's true position on the issues is (θ_j^X, θ_j^Y), voter i's position on the issues is (x_i, y_i), and $\omega_{ij}^X, \omega_{ij}^Y \in (0,1]$. Here, ω_{ij}^K captures voter i's tendency to favorably interpret any imprecise campaign messages she receives, and party j's ability to tailor its campaign messaging to voter i. This projected position θ_{ij}^{PK}, then, is a convex combination of the party's true position and the voter's ideal point weighted by ω_{ij}^K: while the true distance between the

22. Parties do not face a budget constraint when choosing $(r_j^K, r_j^{\neg K})$ (e.g. $r_j^K + r_j^{\neg K} = 1$), as it is assumed that precise messages are no more costly to send than imprecise messages.

voter i and party j on issue X is $\left|\theta_j^X - x_i\right|$, the distance between the misleading projected position and voter i is only $\left(1-\omega_{ij}^X\right)\left|\theta_j^X - x_i\right|$. We assume that ω_{ij}^X and ω_{ij}^Y are determined according to:

$$\omega_{ij}^X = \Omega\left(\frac{|\theta_j^X - x_i|}{\max_{\hat{\theta}\in\Theta_j^X}|\hat{\theta} - x_i|}\right),$$

$$\omega_{ij}^Y = \Omega\left(\frac{|\theta_j^Y - y_i|}{\max_{\hat{\theta}\in\Theta_j^Y}|\hat{\theta} - y_i|}\right),$$

where $\Omega : [0,1] \to [0,\overline{\Omega}] \subset [0,1)$ is a continuous function, with $\Omega(0) = \Omega(1) = 0$, and $\Omega(x) > 0$ for $x \in (0,1)$.[23] We additionally assume that, for any constant $k > 0$ and $z \in \left(0, \frac{1}{k}\right)$, $(1-\Omega(kz))z$ is strictly increasing in z, which ensures that the further a party's true position from a voter, the further the projected position is from the voter.

We assume that $\mathcal{P} : [0,1] \to [\underline{\mathcal{P}}, \overline{\mathcal{P}}] \subset (0,1)$ is a twice continuously differentiable function satisfying $\mathcal{P}(1) = \underline{\mathcal{P}} < \frac{1}{2}$, and $\mathcal{P}'(r_j^K) < 0$, $\mathcal{P}''(r_j^K) < 0$, for $r_j^K \in [0,1]$. This captures the idea that, the more imprecise the party's campaign messages, the more likely voters are to see a projected position rather than the party's true position. Naturally, voters do not know whether they have observed the party's true position or a projected position.

Similarly, we assume that if a voter does not witness or does not comprehend party j's campaign (either because she witnessed and comprehended a different party's campaign or she witnessed or comprehended no campaign), but the voter does observe a position for party j, then, with probability $1 - \underline{\mathcal{P}}$, the position she observes is party j's true position, and, with probability, $\underline{\mathcal{P}}$ the position she observes is party j's projected position θ_{ij}^{PK}. Thus, voters that do not witness a party's campaign but observe a position are more likely to see the party's true position than voters who receive and comprehend an imprecise campaign message.

Apart from these two differences, all other assumptions are unchanged from the baseline model. That is, voters are ambiguity averse, and parties choose their levels of issue emphasis and message precision in order to maximize their vote share.

3.2 Vote Choice

Voter decisions in this extended model are the same as in the baseline model, except that voters may see party's projected positions rather than their true positions. However, recall that voters are ambiguity averse, and are also aware that any position they have observed may be a projected, rather than true, position of the party. As such, when voters see neither party's

23. These assumptions ensure that projection is not very effective at moderating a party's image if the party's true position is sufficiently far from the voter's ideal point.

position on an issue, they vote for each party with probability $\frac{1}{2}$. On the other hand, if a voter sees one or both parties' positions on the issue important to her, she infers parties' positions to be the worst possible combination of party positions θ that is consistent with what she has observed. This requires that each voter considers the possibility that the party positions she sees are projected, and that the true policy distance between party positions and the voter's ideal point is larger than the distance between the observed party positions and the voter.

Nevertheless, as the following lemma shows, it emerges that voter decisions are still essentially unchanged from the baseline model.

Lemma 2. *If a voter i observes a (possibly false) position for only a party j on the issue she cares about, and observes no position for the other party $\neg j$, she always votes for party j. If a voter observes a (possibly false) position for both parties on the issue she cares about, she always votes for whichever party's observed position is closest to her ideal point.*

Proof. See Appendix G. □

Using Lemma 2, it follows that the vote share of party j is given by the following expression:

$$\begin{aligned} V_j = \frac{\rho_0}{2} + \sum_{K\in\{X,Y\}} \rho_j^{KF} + \rho_j^{KI} + \psi_j^K(\rho_{B,NP}^{KF} + \rho_{B,NP}^{KI} + \rho_{B,BP}^{KF} + \rho_{B,BP}^{KI}) \\ + \sum_{K\in\{X,Y\}} \overline{\psi}_j^K(\rho_{B,P_j}^{KF} + \rho_{B,P_j}^{KI}) + \underline{\psi}_j^K(\rho_{B,P_{\neg j}}^{KF} + \rho_{B,P_{\neg j}}^{KI}) \end{aligned} \tag{19}$$

Here, as in the baseline model, ρ_0 is the proportion of voters that see no positions on any issue, ρ_j^{KF} and ρ_j^{KI} are the proportions of K-focused and impressionable voters respectively who only see a position for party j on issue K. $\rho_{B,NP}^{KF}$ and $\rho_{B,NP}^{KI}$ are the proportions of K-focused and impressionable voters who see both parties' true (i.e. not projected) positions on issue K. $\rho_{B,BP}^{KF}$ and $\rho_{B,BP}^{KI}$ are the proportions of K-focused and impressionable voters who see both parties' projected positions on issue K. ρ_{B,P_j}^{KF}, ρ_{B,P_j}^{KI} are the proportions who see some position for both parties on issue K, but see party j's position projected, and see party $\neg j$'s true position. Similarly $\rho_{B,P_{\neg j}}^{KF}$ and $\rho_{B,P_{\neg j}}^{KI}$ are the analogous proportions who see party $\neg j$'s position projected, and see party j's true position. ψ_j^K is the same as in the baseline model. $\overline{\psi}_j^K$ is the proportion of voters who prefer party j's projected position on issue K to party $\neg j$'s true position. Likewise, $\underline{\psi}_j^K$ is the proportion who prefer $\neg j$'s projected position to j's true position. Since, for any voter i, a party j's projected position will be at least as close to the voter as the party's true position, it follows that any voter who would vote for a party's true position would also vote for its projected position. As such, it follows that $\overline{\psi}_j \geq \psi_j \geq \underline{\psi}_j$. In Appendix G, we give the full formula for each of the ρ and ψ terms, which depend on parties' choices of e_j^K and r_j^K.

3.3 Equilibrium Party Strategies

We now characterize the equilibrium of the extended model, and show that the key qualitative conclusions of the baseline model above generalize to this setting. In the extended model, each party's optimization problem is similar to the baseline model: party j chooses values of $e_j^X, e_j^Y, r_j^X, r_j^Y \in [0,1]$ to maximize its vote share V_j, subject to the constraint $e_j^X + e_j^Y = 1$. In the results that follow, for simplicity, we focus on the case where $\gamma_1 < \frac{4}{9}$, and $\overline{\psi}_j^K > \psi_j^K > \underline{\psi}_j^K$ for each K and j. The condition $\gamma_1 < \frac{4}{9}$ ensures that the revelation incentive is sufficiently powerful to encourage parties to emphasize both issues to some degree (in the baseline model, the equivalent condition was $\gamma_1 < \frac{1}{2}$). The condition $\overline{\psi}_j^K > \psi_j^K > \underline{\psi}_j^K$ is very weak: it requires only that there are at least some voters who would support each party if they saw its projected position who would not support it otherwise. The following proposition characterizes the equilibrium in this case.

Proposition 6. *Provided $\gamma_1 < \frac{4}{9}$ and $\overline{\psi}_j^K > \psi_j^K > \underline{\psi}_j^K$ for each K and j, there exists a unique equilibrium, in which, for each party j, $e_j^X, e_j^Y, r_j^X, r_j^Y \in (0,1)$ and solve the first order conditions:*

$$\frac{\partial V_j}{\partial e_j^X} = \frac{\partial V_j}{\partial e_j^Y},$$
$$\frac{\partial V_j}{\partial r_j^X} = 0,$$
$$\frac{\partial V_j}{\partial r_j^Y} = 0.$$

Proof. See Appendix G. □

Intuitively, Proposition 6 establishes that, under these conditions, parties choose to emphasize both issues to some degree, and choose to send somewhat but not totally imprecise campaign messages. Parties' first order condition for the choice of issue emphasis is the same as in the baseline model, and the first order conditions for each r_j^K are simply that the marginal effect of r_j^K on the party's vote share is zero.

We now establish that the comparative statics of the baseline model generalize to the extended model. In the extended model, the comparative statics with respect to changes in ψ_j^K are slightly complicated by the fact that the relevant measure of the popularity of party j's position is variously $\overline{\psi}_j^K$, ψ_j^K or $\underline{\psi}_j^K$, depending on whether voters observe true or projected party positions. Therefore, for the purpose of studying comparative statics, we assume that $\overline{\psi}_j^K = \psi_j^K + \overline{\varphi}_j^K$ and $\underline{\psi}_j^K = \psi_j^K - \underline{\varphi}_j^K$, for some $\overline{\varphi}_j^K, \underline{\varphi}_j^K \in [0,1]$ and study the effects of varying ψ_j^K while holding constant $\overline{\varphi}_j^K$ and $\underline{\varphi}_j^K$. Then, an increase in ψ_j^K represents an increase in the popularity of party j's position on K to voters that see the true position as well as to voters that see the projected position. Additionally, we will assume that

$$\min\{(\overline{\psi}_j^K - \overline{\psi}_j^{\neg K})(\psi_j^K - \psi_j^{\neg K}); (\overline{\psi}_j^K - \overline{\psi}_j^{\neg K})(\underline{\psi}_j^K - \underline{\psi}_j^{\neg K})\} \geq 0, \tag{20}$$

which is to say that $\overline{\psi}_j^K - \overline{\psi}_j^{\neg K}$ has the same sign as both $\psi_j^K - \psi_j^{\neg K}$ and $\underline{\psi}_j^K - \underline{\psi}_j^{\neg K}$. This ensures that, if a party's true position on e.g. issue X is more popular than its true position on issue Y, then this will also hold when voters see parties' projected positions on these issues. Let $e_j^{\star K}(\overline{\pi}, \gamma_0, \gamma_1, \psi, \overline{\varphi}, \underline{\varphi})$ and $r_j^{\star K}(\overline{\pi}, \gamma_0, \gamma_1, \psi, \overline{\varphi}, \underline{\varphi})$ denote party j's equilibrium choices of $e_j^{\star K}$ and r_j^K given the values of the other variables and parameters. Then, Proposition 7 shows that the results of Propositions 4 and 5 continue to hold in the extended model.

Proposition 7. *Suppose that $\gamma_1 < \frac{4}{9}$, and that for each K and j, $\overline{\psi}_j^K > \psi_j^K > \underline{\psi}_j^K$, and that equation (20) holds. Finally suppose that $\overline{\psi}_j^K = \psi_j^K + \overline{\varphi}_j^K$ and $\underline{\psi}_j^K = \psi_j^K - \underline{\varphi}_j^K$, for constants $\overline{\varphi}_j^K, \underline{\varphi}_j^K \in [0, 1]$. Then the results of Propositions 4 and 5 continue to hold in the extended model.*

Proof. See Appendix. □

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Finally, Proposition 8 provides a novel comparative static for the extended model: if a party's true position is less popular, it has a stronger incentive to send imprecise messages in order to project a false position to voters.

Proposition 8. *Suppose that the conditions stated in Proposition 7 hold. Then a party j's optimal choice of $r_j^{\star K}$ satisfies:*

$$\frac{\partial r_j^{\star K}}{\partial \psi_j^K} \leq 0$$

Proof. See Appendix G. □

4 Conclusion

Why do parties devote any time to unfavourable issues during their campaigns? Existing research on issue selection by parties has established that parties spend much of their campaigns focusing on the same issues as each other, and has also struggled to explain why, if a party is able to influence the salience of a preferred issue for voters, it will spend any time on an issue on which its position is unpopular with the majority of voters. We suggest that one reason parties may choose to address voters on such issues is because doing so reveals the party's position on the issue to potentially sympathetic voters. This provides a 'revelation incentive' for parties to campaign on the issues that voters care about – since voters may be disinclined to vote for a party if they do not know its opinion on the issues that matter. This revelation incentive is distinct from the tendency—already noted in the literature—for parties to emphasize issues on which they are favoured, in order to increase the importance of these issues in the minds of voters.

Motivated by this evidence, we develop a formal model in which the tendency of voters to avoid parties if they do not know their positions encourages parties to emphasize the issues that are salient to voters in their campaigns. In our model, we establish the conditions under which this 'revelation incentive' leads parties to place some emphasis on every issue in campaigns, and also to particularly emphasize issues that are salient to voters. At the same time, we show that a party will emphasize an issue relatively more if its position on this issue is relatively more popular, in order to increase the salience of this issue to voters. Our findings are robust to the possibility that parties may be able to communicate imprecisely about their position on issues where their true position is unpopular, and contrast with much of the formal theoretic literature, which finds that parties should never campaign on issues unfavourable to them. The 'revelation incentive' in our model therefore provides an explanation hitherto missing from the formal literature for why a party might emphasize an unfavourable issue, and also why multiple parties may campaign on the same issues when these issues are particularly salient to voters – characteristics of real-world campaigns that have been long-acknowledged by empirical researchers.

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Appendices

A Proof of Proposition 1

First, we show that, for $e_j^K < 1$, $\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} > 0$.

Substituting equation (6) into equation (8) we have:

$$\hat{\rho}_j^K = \frac{\rho_j^{KF} + \rho_j^{KI} + \rho_B^{KF} + \rho_B^{KI}}{\overline{\pi}_K + \rho_B^{KI} + \sum_{i=1}^{2} \rho_i^{KI}}$$

Differentiating using the product rule:

$$\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} = \left(\frac{1}{\pi_K^2}\right)(\frac{\partial \rho_j^{KF}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K} + \frac{\partial \rho_B^{KF}}{\partial e_j^K} + \frac{\partial \rho_B^{KI}}{\partial e_j^K})(\overline{\pi}_K + \rho_B^{KI} + \sum_{i=1}^{2} \rho_i^{KI})$$

$$- \left(\frac{1}{\pi_K^2}\right)(\rho_j^{KF} + \rho_j^{KI} + \rho_B^{KF} + \rho_B^{KI})(\frac{\partial \rho_B^{KI}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K} + \frac{\partial \rho_{\neg j}^{KI}}{\partial e_j^K})$$

which can be rewritten as:

$$\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} = \left(\frac{1}{\pi_K}\right)(\frac{\partial \rho_j^{KF}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K} + \frac{\partial \rho_B^{KF}}{\partial e_j^K} + \frac{\partial \rho_B^{KI}}{\partial e_j^K})$$

$$- \left(\frac{1}{\pi_K}\right)\hat{\rho}_j^K(\frac{\partial \rho_B^{KI}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K} + \frac{\partial \rho_{\neg j}^{KI}}{\partial e_j^K}) \tag{A.1}$$

or,

$$\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} = \left(\frac{1}{\pi_K}\right)(\frac{\partial \rho_j^{KF}}{\partial e_j^K} + \frac{\partial \rho_B^{KF}}{\partial e_j^K}) + \left(\frac{1}{\pi_K}\right)(\frac{\partial \rho_B^{KI}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K})(1 - \hat{\rho}_j^K)$$
$$- \left(\frac{1}{\pi_K}\right)\hat{\rho}_j^K \frac{\partial \rho_{\neg j}^{KI}}{\partial e_j^K} \tag{A.2}$$

or

$$\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} = \left(\frac{1}{\pi_K}\right)(\frac{\partial \rho_j^{KF}}{\partial e_j^K} + \frac{\partial \rho_B^{KF}}{\partial e_j^K}) + \left(\frac{1}{\pi_K}\right)(\frac{\partial \rho_B^{KI}}{\partial e_j^K} + \frac{\partial \rho_j^{KI}}{\partial e_j^K})(1 - \hat{\rho}_j^K) \tag{A.3}$$

where the last step uses that $\frac{\partial \rho_{\neg j}^{KI}}{\partial e_j^K} = 0$, from equation (2).

Using equations (1)-(5), this can be written:

$$\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} = \left(\frac{\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{\pi_K}\right) + \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\pi_K}\right)\left(1-\frac{\gamma_0}{2}\right)(1-\hat{\rho}_j^K)\eta'(e_j^K) \tag{A.4}$$

Note that $\pi_K \geq \overline{\pi}_K$, from equation (6), since ρ_B^{KI} and ρ_j^{KI} are non-negative. Then, that $\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} > 0$ if $e_j^K < 1$ then follows immediately, since $\eta'(e_j^K) > 0$ and $\hat{\rho}_j^K \in [0,1]$.

To show that $\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} \leq \frac{\eta'(e_j^K)(1-\gamma_0)}{\overline{\pi}}$, we first show that $\hat{\rho}_j^K \geq \gamma_0$.

To this end, note that, since, $\gamma_1 \geq \gamma_0$, it is immediate from equation (3) that

$$\rho_B^{KF} \geq \gamma_0 \overline{\pi}_K \tag{A.5}$$

Furthermore, equations (2) and (4) imply that:

$$\begin{aligned}
\gamma_0(\rho_B^{KI} + \rho_{\neg j}^{KI}) &= \gamma_0(1-\overline{\pi}_X-\overline{\pi}_Y)\left(\frac{\gamma_1(\eta(e_1^K)+\eta(e_2^K))}{2} + (\frac{\eta(e_j^K)(1-\gamma_1)}{2}\right) \\
&\leq \gamma_0(1-\overline{\pi}_X-\overline{\pi}_Y)\left(\frac{\eta(e_1^K)+\eta(e_2^K)}{2}\right) \\
&\leq (1-\overline{\pi}_X-\overline{\pi}_Y)\left(\frac{\gamma_1(\eta(e_1^K)+\eta(e_2^K))}{2}\right) \\
\gamma_0(\rho_B^{KI} + \rho_{\neg j}^{KI}) &\leq \rho_B^{KI} \qquad \text{(A.6)}
\end{aligned}$$

Therefore, using (8) and substituting (A.5) and (A.6), we have that:

$$\begin{aligned}
\hat{\rho}_j^K &= \frac{\rho_j^{KF} + \rho_j^{KI} + \rho_B^{KF} + \rho_B^{KI}}{\overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^2 \rho_j^{KI}} \\
&\geq \frac{\rho_j^{KI} + \rho_B^{KF} + \rho_B^{KI}}{\overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^2 \rho_j^{KI}} \\
&\geq \frac{\rho_j^{KI} + \rho_B^{KF} + \gamma_0(\rho_B^{KI} + \rho_{\neg j}^{KI})}{\overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^2 \rho_j^{KI}} \\
&\geq \frac{\rho_j^{KI} + \gamma_0\overline{\pi}_K + \gamma_0(\rho_B^{KI} + \rho_{\neg j}^{KI})}{\overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^2 \rho_j^{KI}} \\
&\geq \frac{\gamma_0\rho_j^{KI} + \gamma_0\overline{\pi}_K + \gamma_0(\rho_B^{KI} + \rho_{\neg j}^{KI})}{\overline{\pi}_K + \rho_B^{KI} + \sum_{j=1}^2 \rho_j^{KI}} \\
&\geq \gamma_0
\end{aligned}$$

Therefore, it follows that $\hat{\rho}_j^K \geq \gamma_0$. Note also that $\pi_K \geq \overline{\pi}_K$. Substituting these two inequalities into equation (A.4) yields:

$$\begin{aligned}
\frac{\partial \hat{\rho}_j^K}{\partial e_j^K} &= \left(\frac{\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{\pi_K}\right) + \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\pi_K}\right)\left(1-\frac{\gamma_0}{2}\right)(1-\hat{\rho}_j^K)\eta'(e_j^K) \\
&\leq \left(\frac{\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{\pi_K}\right) + \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\pi_K}\right)(1-\hat{\rho}_j^K)\eta'(e_j^K) \\
&\leq \left(\frac{\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{\pi_K}\right) + \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\pi_K}\right)(1-\gamma_0)\eta'(e_j^K) \\
&\leq \left(\frac{\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{\overline{\pi}_K}\right) + \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\overline{\pi}_K}\right)(1-\gamma_0)\eta'(e_j^K) \\
&\leq \left(\frac{2\overline{\pi}_K \eta'(e_j^K)(1-\gamma_0)}{2\overline{\pi}_K}\right) + \left(\frac{1-\overline{\pi}_K}{2\overline{\pi}_K}\right)(1-\gamma_0)\eta'(e_j^K) \\
&= \left(\frac{1+\overline{\pi}_K}{2}\right)\left(\frac{1}{\overline{\pi}_K}\right)(1-\gamma_0)\eta'(e_j^K) \\
&\leq \frac{(1-\gamma_0)\eta'(e_j^K)}{\overline{\pi}_K}
\end{aligned}$$

which was the desired result. □

B Proof of Lemma 1

Consider any $K \in \{X, Y\}$. First, we show that $q^K + q^{\neg K} > 0$. Note that

$$\begin{aligned} 1-\gamma_0-2(1-\psi_j^K)(\gamma_1-\gamma_0) &\geq 1-\gamma_0-2(\gamma_1-\gamma_0) \\ &= 2\left(\frac{1+\gamma_0}{2}-\gamma_1\right) \\ \therefore\ \ 1-\gamma_0-2(1-\psi_j^K)(\gamma_1-\gamma_0) &> 0 \end{aligned} \tag{B.1}$$

where the first line follows from $\psi_j^K \leq 1$ and $\gamma_1 \geq 0$ and the third line follows from $\gamma_1 < \frac{1+\gamma_0}{2}$. Furthermore, since $\overline{\pi}_X \in (0,1), \overline{\pi}_Y \in (0, 1-\overline{\pi}_X)$, it follows that

$$1+\overline{\pi}_K+1-\overline{\pi}_{\neg K} > 1-\overline{\pi}_K+1-\overline{\pi}_{\neg K} > 0 \tag{B.2}$$

Substituting (B.1) and (B.2) into equation (14) reveals that

$$q^K > \gamma_0(\psi_j^K-\psi_j^{\neg K})\,(1-\overline{\pi}_K-\overline{\pi}_{\neg K}) \tag{B.3}$$

Repeating exactly the same line of argument for issue $\neg K$ similarly reveals that

$$q^{\neg K} > \gamma_0(\psi_j^{\neg K}-\psi_j^K)\,(1-\overline{\pi}_K-\overline{\pi}_{\neg K}) \tag{B.4}$$

Combining (B.3) and (B.4) reveals that

$$q^K+q^{\neg K} > \gamma_0(\psi_j^K-\psi_j^{\neg K}+\psi_j^{\neg K}-\psi_j^K)\,(1-\overline{\pi}_K-\overline{\pi}_{\neg K}) = 0$$

It remains to show that there exists a unique solution $e^\star$ to (15). To prove this, note that equation (14) implies that $q^K \geq 0$, $q^{\neg K} \geq 0$. Recall that $\eta'(0) > 0$ and $\eta'(1) = 0$. Then, when $e^\star = 0$, the left hand side of equation (15) is equal to $q^K\eta'(0) \geq 0$. Similarly, when $e^\star = 1$, the left hand side of (15) is equal to $-q^{\neg K}\eta'(0) \leq 0$. Then, the existence and uniqueness of a solution $e^\star$ to equation (14) follows from the intermediate value theorem, provided that the left hand side of (14) is strictly decreasing in $e^\star$. We now show that this is the case.

To this end, we take the derivative of the left hand side of (14) with respect to $e^\star$, which is equal to $q^K\eta''(e^\star) + q^{\neg K}\eta''(1-e^\star)$. Now, since $\eta''(e) < 0$ for any $e \in [0,1)$, and $q^K \geq 0, q^{\neg K} \geq 0, q^K + q^{\neg K} > 0$, this implies that the left hand side of (14) is strictly decreasing in $e^\star$. □

C Proof of Propositon 2

As discussed in section 2.6, a necessary condition for an optimal strategy for party j, given the strategy of party $\neg j$, is that, for each $\theta \in \Theta$, there must exist $\lambda_j \geq 0$ and $\mu_j \geq 0$ such that party j's emphasis choices $e_j^X, e_j^Y \in [0,1]$ satisfy the following Kuhn-Tucker conditions:

$$\frac{\partial V_j}{\partial e_j^X} - \frac{\partial V_j}{\partial e_j^Y} + \lambda_j - \mu_j = 0 \tag{C.1}$$

$$\lambda_j e_j^X = 0 \tag{C.2}$$

$$\mu_j(1 - e_j^X) = 0 \tag{C.3}$$

Furthermore, the emphasis choices e_j^K must satisfy the constraint

$$e_j^X + e_j^Y = 1 \tag{C.4}$$

To prove proposition 2, we first show that, for each $\theta \in \Theta$, there is exactly one solution to the Kuhn-Tucker conditions (C.1)-(C.4), namely where each e_j^K, for $K \in \{X, Y\}$ is equal to the unique $e^\star$ that solves equation (15). To show this, it is sufficient to show that any solution to the Kuhn-Tucker conditions must also solve equation (15) and secondly to show that the $e^\star$ solving(15) itself solves the Kuhn-Tucker conditions.

First, we prove the former, that any solution to the Kuhn-Tucker conditions must have issue emphases that solves (15). We show the result for issue X. The argument for issue Y is virtually identical. Let $e_j^X, e_j^Y \in [0,1]$ be some choice of emphases which, along with some $\lambda_j \geq 0, \mu_j \geq 0$ solve (C.1)-(C.4) for some $\theta \in \Theta$. We now prove that e_j^X is equal to the e^* that solves (15) when $K = X$. We prove this result separately for the cases $e_j^X \in (0,1)$, $e_j^X = 0$ and $e_j^X = 1$.

Consider first the case $e_j^X \in (0,1)$, so that $\lambda_j = \mu_j = 0$ by the complementary slackness conditions. Note that equations (14) and (13) imply that, for $K \in \{X, Y\}$:

$$\frac{\partial V_j}{\partial e_j^K} = \frac{q^K \eta'(e_j^K)}{4} \text{ if } q^K > 0 \tag{C.5}$$

$$\frac{\partial V_j}{\partial e_j^K} \leq \frac{q^K \eta'(e_j^K)}{4} \text{ if } q^K = 0 \tag{C.6}$$

We know from Lemma 1 that either $q^X > 0$ or $q^Y > 0$. Therefore, equations (C.5) and (C.6) imply that either $\frac{\partial V_j}{\partial e_j^X} > 0$ or $\frac{\partial V_j}{\partial e_j^Y} > 0$ or both, since $e_j^X \in (0,1), e_j^Y \in (0,1)$ and therefore $\eta'(e_j^X) > 0$ and $\eta'(e_j^Y) > 0$. However, in that case, since $\lambda_j = \mu_j = 0$, the first order condition (C.1) cannot be satisfied unless $\frac{\partial V_j}{\partial e_j^X} > 0$ and $\frac{\partial V_j}{\partial e_j^Y} > 0$. Then, substituting equations (C.4), (C.5), and $\lambda_j = \mu_j = 0$ into the first order condition (C.1), we see that (C.1) is equivalent to

(15) when $e_j^X = e^\star$. Then, (C.1) is satisfied only if e_j^X is equal to the $e^\star$ that solves (15).

Now, consider the case $e_j^X = 1$ and $e_j^Y = 0$, so that $\lambda_j = 0, \mu_j \geq 0$. Then, since $\eta'(1) = 0$ by assumption, equation (13) implies that $\frac{\partial V_j}{\partial e_j^X} = 0$. Then, given $\lambda_j = 0, \mu_j \geq 0$, the first order condition (C.1) can only be satisfied if $\frac{\partial V_j}{\partial e_j^Y} \leq 0$. Then, since $\eta'(e_j^Y) = \eta'(0) > 0$, equations (C.5) and (C.6) imply that $q^Y = 0$. Then, since $q^X \geq 0$ and $q^Y = 0$, it follows that $e^\star = 1 = e_j^X$ is a solution to equation (15).

Finally, consider the case $e_j^X = 0$ and $e_j^Y = 1$, so that $\lambda_j \geq 0, \mu_j = 0$. This case is almost identical to the previous case. Since $\eta'(1) = 0$, it follows that $\frac{\partial V_j}{\partial e_j^Y} = 0$. Then, (C.1) can only be satisfied if $\frac{\partial V_j}{\partial e_j^X} \leq 0$. Then, equations (C.5) and (C.6) imply that $q^X = 0$. This implies that $e^\star = 0 = e_j^X$ is a solution to equation (15).

We have shown that any solution e_j^X to the Kuhn-Tucker conditions must also solve (15). Now, we argue that setting $e_j^X = e^\star$, where $e^\star$ solves(15) when issue $K = X$, itself provides a solution to the Kuhn-Tucker conditions.

First, suppose that the solution $e^\star \in (0,1)$. Then, since $\eta'(e^\star) > 0$ and $\eta'(1 - e^\star)$ it must be the case that $q^X > 0$ and $q^Y > 0$ or the solution $e^\star$ would not satisfy (15). In that case, using equation (C.5), it is apparent that (15) is equivalent to the first order condition (C.1) when $e_j^X = e^\star$, and when $\lambda_j = \mu_j = 0$. This therefore satisfies the Kuhn-Tucker conditions.

Now, consider the case where (15) has the solution $e^\star = 1$, when issue $K = X$. We show that $e_j^X = 1$ is a solution to the Kuhn-Tucker conditions. Since $\eta'(1) = 0$, equation (15) implies that it must be the case that $q^Y = 0$, in which case equation (C.6) implies that $\frac{\partial V_j}{\partial e_j^Y} \leq 0$, when $e_j^Y = 0$. Since $\eta'(1) = 0$, it follows from (13) $\frac{\partial V_j}{\partial e_j^Y} = 0$ when $e_j^X = 1$. Then, setting $\lambda_j = 0$, $\mu_j = -\frac{\partial V_j}{\partial e_j^Y}$, and $e_j^X = 1$, $e_j^Y = 0$ satisfies the Kuhn-Tucker conditions.

The case where (15) has the solution $e^\star = 0$, when issue $K = X$ is almost identical to the previous case. It can be shown by a symmetrical argument that $q^X = 0$ and that the solution $e_j^X = 0$, $e_j^Y = 1$, $\lambda_j = -\frac{\partial V_j}{\partial e_j^X} \geq 0$, $\mu_j = 0$ satisfies the Kuhn-Tucker conditions. Then, it follows that, in general, setting $e_j^X = e^\star$, where $e^\star$ solves(15) when issue $K = X$, provides a solution to the Kuhn-Tucker conditions. By a symmetrical argument for issue Y, it follows that setting $e_j^Y = e^\star$, where $e^\star$ solves(15) when issue $K = Y$, provides a solution to the Kuhn-Tucker conditions.

It follows, then, that for each party and each $\theta \in \Theta$, the Kuhn-Tucker conditions (C.1)-(C.4) have exactly one solution, in which each e_j^K, for $K \in \{X, Y\}$ is equal to the unique $e^\star$ that solves equation (15). Now, for any $\theta \in \Theta$, and any emphasis choices $e_{\neg j}^X, e_{\neg j}^Y$ by party $\neg j$, it must be the case that party j has at least one best response e_j^X, e_j^Y, that maximises j's vote share given θ and $e_{\neg j}^X, e_{\neg j}^Y$. That a best response e_j^X, e_j^Y must exist follows from the Weierstrass theorem: party j must choose its emphases e_j^X, e_j^Y from the compact set defined by $e_j^X \in [0,1]$, $e_j^Y = 1 - e_j^X$. Since j's vote share V_j is continuous in e_j^X, e_j^Y, it follows that a choice that maxmises vote share must exist. Since the Kuhn-Tucker conditions are necessary for an optimal emphasis choice for each party, it follows, for each $\theta \in \Theta$ and choice $e^X_{\neg j}, e^Y_{\neg j}$ by party $\neg j$, that party j's best response to the emphasis choices of party $\neg j$ then it must be where each e^K_j, for $K \in \{X, Y\}$ is equal to the unique $e^\star$ that solves equation (15), given θ. Note that the emphasis choices of party $\neg j$ do not appear in equation (15), and do not influence q^K or $q^{\neg K}$. Therefore party j's best response to the actions of party $\neg j$ exists, is unique and does not depend on the actions of party $\neg j$. Since this is true for both parties, it follows that there exists a unique equilibrium in which each party is best responding to the other, in which, for each $j \in \{1, 2\}$, for each $K \in \{X, Y\}$ and for each $\theta \in \Theta$, the emphasis e^K_j is equal to the unique $e^\star$ that solves equation (15). $\square$

D Proof of Proposition 3

Equation (15) has the solution $e^\star \in (0,1)$ if $q^K > 0$, $q^{\neg K} > 0$ since the left hand side of (15) is strictly decreasing in $e^\star$, is strictly positive when $e^\star = 0$ and strictly negative when $e^\star = 1$. Equally, if $q^{\neg K} = 0$, then $q^K > 0$ and (15) has the solution $e^\star = 1$. Recall that $e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y)$ solves (15). Therefore, to prove the proposition, it suffices to show that $q^K > 0$, $q^{\neg K} > 0$ for $\gamma_0 \leq \gamma_1 < \frac{1}{2}$, and to show that, for given values of $\overline{\pi}_X, \overline{\pi}_Y, \psi_j^X, \psi_j^Y$, there exists a $\gamma^\star \in \left(\frac{1}{2}, 1\right)$ such that $\gamma_1 \geq \gamma_0 \geq \gamma^\star$ implies that $q^{\neg K} = 0$.

We first show that $q^K > 0$ for any $K \in \{X, Y\}$ provided $\gamma_0 \leq \gamma_1 < \frac{1}{2}$, which then establishes that $e_j^{\star K}(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y) \in (0,1)$ in this case. To show this, note that ψ_j^K, $\psi_j^{\neg K} \in [0,1]$, for any $\theta \in \Theta$. Using this and that $\gamma_0 \leq \gamma_1 < \frac{1}{2}$, it follows that

$$1 - \gamma_0 - 2(1 - \psi_j^K)(\gamma_1 - \gamma_0) \geq 1 + \gamma_0 - 2\gamma_1$$
$$\gamma_0(\psi_j^K - \psi_j^{\neg K}) \geq -\gamma_0$$

Substituting these into equation (14) and using $\pi_K > 0$, we can infer that $q^K > 0$ provided that:

$$\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right)\left(1 + \gamma_0 - 2\gamma_1\right) - \gamma_0\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right) > 0$$

It is immediate that this condition holds if $\gamma_0 \leq \gamma_1 < \frac{1}{2}$.

To complete the proof of the proposition, it remains to show that, for given values of $\overline{\pi}_X, \overline{\pi}_Y, \psi_j^X, \psi_j^Y$, there exists a $\gamma^\star \in \left(\frac{1}{2}, 1\right)$ such that $\gamma_1 \geq \gamma_0 \geq \gamma^\star$ implies that $q^{\neg K} = 0$. To show this, consider any $\gamma^\star \in (\frac{1}{2}, 1)$. If $\gamma_1 \geq \gamma_0 \geq \gamma^\star$ then it follows from equation (14) that $q^K > 0$ can only hold for some j, K if the following inequality is satisfied:

$$\left(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}\right)\left(1 - \gamma_0\right) + \gamma_0(\psi_j^K - \psi_j^{\neg K})\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right) > 0 \tag{D.1}$$

Since the left hand side of (D.1) is decreasing in γ_0, it follows that this, in turn, can only be satisfied if the following inequality is satisfied:

$$\left(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}\right)\left(1 - \gamma^\star\right) + \gamma^\star(\psi_j^K - \psi_j^{\neg K})\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right) > 0 \tag{D.2}$$

Suppose that $\psi_j^{\neg K} > \psi_j^K$. Then, the inequality (D.2) can be rearranged to:

$$\frac{1 + \overline{\pi}_K - \overline{\pi}_{\neg K}}{(\psi_j^{\neg K} - \psi_j^K)\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right) + 1 + \overline{\pi}_K - \overline{\pi}_{\neg K}} > \gamma^\star \tag{D.3}$$

It follows that $q^K > 0$ cannot hold if $\gamma^\star$ is weakly greater than the left hand side of (D.3). Furthermore, note that the left hand side of (D.3) must be less than 1, since $\psi_j^{\neg K} - \psi_j^K > 0$. Therefore, if $\psi_j^{\neg K} - \psi_j^K > 0$ then there exists sufficiently high $\gamma^\star < 1$ such that, $\gamma_1 \geq \gamma_0 \geq \gamma^\star$

implies that party j will choose $e_j^K = 0$. By symmetry, it follows that if $\psi_j^K > \psi_j^{\neg K} > 0$ then there is a $\gamma^\star < 1$ such that $\gamma_1 \geq \gamma_0 \geq \gamma^\star$ implies $e_j^{\neg K} = 0$, which implies $e_j^K = 1$.

$\square$

E Proof of Proposition 4

By Proposition 2, $e_j^{\star K}$ is given by the $e^\star$ that solves (15). Applying the implicit function theorem to equation (15), we have that:

$$\frac{\partial e^\star}{\partial q^K} = \frac{-\eta'(e^\star)}{q^K\eta''(e^\star) + q^{\neg K}\eta''(1-e^\star)} > 0$$
$$\frac{\partial e^\star}{\partial q^{\neg K}} = \frac{\eta'(1-e^\star)}{q^K\eta''(e^\star) + q^{\neg K}\eta''(1-e^\star)} < 0$$

Then, all the desired comparative static results follow from the following inequalities:

$$\frac{\partial q^K}{\partial \psi_j^K} > 0 \tag{E.1}$$
$$\frac{\partial q^{\neg K}}{\partial \psi_j^K} < 0 \tag{E.2}$$
$$\frac{\partial q^K}{\partial \overline{\pi}_K} - \frac{\partial q^K}{\partial \overline{\pi}_{\neg K}} \geq 0 \tag{E.3}$$
$$\frac{\partial q^{\neg K}}{\partial \overline{\pi}_K} - \frac{\partial q^{\neg K}}{\partial \overline{\pi}_{\neg K}} \leq 0 \tag{E.4}$$
$$\left(\frac{\partial q^K}{\partial \overline{\pi}_K} + \frac{\partial q^K}{\partial \overline{\pi}_{\neg K}}\right)\left(\psi_j^K - \psi_j^{\neg K}\right) \leq 0 \tag{E.5}$$
$$\left(\frac{\partial q^{\neg K}}{\partial \overline{\pi}_K} + \frac{\partial q^{\neg K}}{\partial \overline{\pi}_{\neg K}}\right)\left(\psi_j^K - \psi_j^{\neg K}\right) \geq 0 \tag{E.6}$$

It remains only to show that the inequalities (E.1)-(E.6) are satisfied. Now, it was shown in the proof of Proposition 3 that $e^\star \in (0,1)$ if and only if $q^K > 0$ and $q^{\neg K} > 0$. Since we assumed that $e_j^{\star K} \in (0,1)$, we conclude, for the given values of $\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi_j^X, \psi_j^Y$, that $q^K > 0$ and $q^{\neg K} > 0$. Then, the inequalities (E.1), (E.2), (E.5) and (E.6) all follow almost immediately from differentiating equation (14).

The inequalities (E.3) and (E.4) also follow immediately from differentiating (14) once we recall that it was shown in the proof of Lemma 1 that $1 - \gamma_0 - 2(1-\psi_j^K)(\gamma_1 - \gamma_0) > 0$.

□

F Proof of Proposition 5

Consider some $z \in (0,1)$. We seek to find $\pi^\star$ such that, for any K, if $\overline{\pi}_K > \pi^\star$ then in equilibrium both parties j will choose $e_j^K > z$ for all $\theta \in \Theta$.

Proposition 2 and Lemma 1 reveal that $e^\star(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi^X_, \psi^Y_j) = z$ if and only if

$$q^K \eta'(z) - q^{\neg K} \eta'(1-z) = 0$$

which is the same as:

$$\frac{q^K}{q^{\neg K}} = \frac{\eta'(1-z)}{\eta'(z)} \tag{F.1}$$

Now, it was shown in the proof of Proposition 4 that $\frac{\partial e^\star}{\partial q^K} > 0$ and $\frac{\partial e^\star}{\partial q^{\neg K}} < 0$. Then, combining this with equation (F.1), it follows that $e^\star(\overline{\pi}_X, \overline{\pi}_Y, \gamma_0, \gamma_1, \psi^X_, \psi^Y_j) > z$ if and only if:

$$\frac{q^K}{q^{\neg K}} > \frac{\eta'(1-z)}{\eta'(z)} \tag{F.2}$$

Define

$$\zeta = \frac{\eta'(1-z)}{\eta'(z)} > 0$$

Then, using Proposition 2 and equation (F.2), it follows that both parties will choose $e_j^K > z$ for any $\theta \in \Theta$, if, for all $\psi_j^X \in [0,1]$ and $\psi_j^Y \in [0,1]$, we have that $\frac{q^K}{q^{\neg K}} > \zeta$.

Therefore, to prove the result, it suffices to show that there exists $\pi^\star \in (0,1)$ such that, for any $K \in \{X, Y\}$, if $\overline{\pi}_K > \pi^\star$ then, for any $\psi_j^X \in [0,1]$ and $\psi_j^Y \in [0,1]$, we have that $\frac{q^K}{q^{\neg K}} > \zeta$.

We set:

$$\pi^\star = \max\left\{\frac{1}{2}; 1 - \frac{1-2\gamma_1}{2\zeta}\right\} \tag{F.3}$$

Since the proposition assumes that $\gamma_1 < \frac{1}{2}$, it follows that $\pi^\star$ is in the interval $[\frac{1}{2}, 1)$. Consider some $K \in \{X, Y\}$. We now show that if $\overline{\pi}_K > \pi^\star$ then $q^K > 1 - 2\gamma_1$ and $q^{\neg K} < \frac{1-2\gamma_1}{\zeta}$, and therefore that $\frac{q^K}{q^{\neg K}} > \zeta$.

To show that $q^K > 1 - 2\gamma_1$, equation (14) implies that it suffices to show that

$$\begin{aligned}(1 + \overline{\pi}_K - \overline{\pi}_{\neg K})\left(1 - \gamma_0 - 2(1 - \psi_j^K)(\gamma_1 - \gamma_0)\right)\\ +\gamma_0(\psi_j^K - \psi_j^{\neg K})\left(1 - \overline{\pi}_K - \overline{\pi}_{\neg K}\right) > 1 - 2\gamma_1\end{aligned} \tag{F.4}$$

To show that this inequality holds when $\overline{\pi}_K > \pi^\star$, note that, for any $\psi_j^X \in [0,1]$ and $\psi_j^Y \in$

$[0, 1]$:

$$
\begin{aligned}
&(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}) \big(1 - \gamma_0 - 2(1 - \psi_j^K)(\gamma_1 - \gamma_0)\big) + \gamma_0(\psi_j^K - \psi_j^{\neg K}) (1 - \overline{\pi}_K - \overline{\pi}_{\neg K}) \\
\geq &(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}) (1 - \gamma_0 - 2(\gamma_1 - \gamma_0)) - \gamma_0 (1 - \overline{\pi}_K - \overline{\pi}_{\neg K}) \\
\geq &(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}) (1 - \gamma_0 - 2(\gamma_1 - \gamma_0)) - \gamma_0 (1 + \overline{\pi}_K - \overline{\pi}_{\neg K}) \\
= &(1 + \overline{\pi}_K - \overline{\pi}_{\neg K}) (1 - 2\gamma_1) \\
\geq &2\overline{\pi}_K (1 - 2\gamma_1) \\
> &2\pi^\star (1 - 2\gamma_1) \\
> &1 - 2\gamma_1
\end{aligned}
$$

It remains to show that $\overline{\pi}_K > \pi^\star$ implies $q^{\neg K} < \frac{1-2\gamma_1}{\zeta}$, for any $\psi_j^X \in [0, 1]$ and $\psi_j^Y \in [0, 1]$. Since $\zeta > 0$, equation (14) implies that it suffices to show that

$$
\begin{aligned}
(1 + \overline{\pi}_{\neg K} - \overline{\pi}_K) \big(1 - \gamma_0 - 2(1 - \psi_j^{\neg K})(\gamma_1 - \gamma_0)\big) \\
+\gamma_0(\psi_j^{\neg K} - \psi_j^K) (1 - \overline{\pi}_{\neg K} - \overline{\pi}_K) < \frac{1 - 2\gamma_1}{\zeta}
\end{aligned}
\tag{F.5}
$$

To show that this holds, note that:

$$
\begin{aligned}
&(1 + \overline{\pi}_{\neg K} - \overline{\pi}_K) \big(1 - \gamma_0 - 2(1 - \psi_j^{\neg K})(\gamma_1 - \gamma_0)\big) + \gamma_0(\psi_j^{\neg K} - \psi_j^K) (1 - \overline{\pi}_{\neg K} - \overline{\pi}_K) \\
< &(1 + \overline{\pi}_{\neg K} - \overline{\pi}_K) (1 - \gamma_0) + \gamma_0 (1 - \overline{\pi}_{\neg K} - \overline{\pi}_K) \\
< &(1 + \overline{\pi}_{\neg K} - \overline{\pi}_K) (1 - \gamma_0) + \gamma_0 (1 + \overline{\pi}_{\neg K} - \overline{\pi}_K) \\
= &1 - \overline{\pi}_K + \overline{\pi}_{\neg K} \\
< &2(1 - \overline{\pi}_K) \\
< &2(1 - \pi^\star) \\
\leq &\frac{1 - 2\gamma_1}{\zeta}
\end{aligned}
$$

□

G Proofs for Extended Model

Available on request.

H Numerical Examples

To illustrate the implications of the model, we show numerical results for various parameter values. Here we show results for the model with ambiguity averse voters described above. In Appendix I we also outline and present numerical results for an extension of the model in which the assumption that voters are ambiguity averse is replaced by the assumption that voters maximise expected utility.

For the purpose of these numerical examples, we adopt the following baseline parametrisation of the model. We assume that voter ideal points (x_i, y_i) are uniformly distributed across the square $[-1, 1]^2$, so that the cdf of voter ideal points, F, satisfies $F(x, y) = \frac{(x+1)(y+1)}{4}$, for $(x, y) \in [-1, 1]^2$. We assume that the function η takes the form

$$\eta(e) = \alpha(1 - (1 - e)^{1+\tau}), \quad \text{for some constants } \alpha \in (0, \frac{1}{2}], \tau > 0. \tag{H.1}$$

As a baseline, we assume that:

$$\begin{aligned} \gamma_0 = \gamma_1 \quad &= 0.5 \\ \overline{\pi}_X = \overline{\pi}_Y = \alpha = \tau \quad &= 0.3 \end{aligned}$$

In several of the figures below we vary the values of these parameters. The parametrisation is only for illustrative purposes and so is relatively arbitrary. Nevertheless, we note that the choices above are not particularly extreme. $\gamma_0 = \gamma_1 = 0.5$ implies that a voter has probability 0.5 of observing a party's position if she does not witness the party's campaign. $\overline{\pi}_X = \overline{\pi}_Y = 0.3$ implies that roughly equal fractions of voters are issue X-focused, Y-focused and impressionable. $\alpha = 0.3$ implies that if both parties campaign solely on an issue then 60% of voters will witness at least one party's campaign on that issue, moreover party equilibrium strategies can be shown to be completely unaffected by the value of this parameter. $\tau = 0.3$ implies that the function $\eta(e)$ is (only) slightly concave.[24]

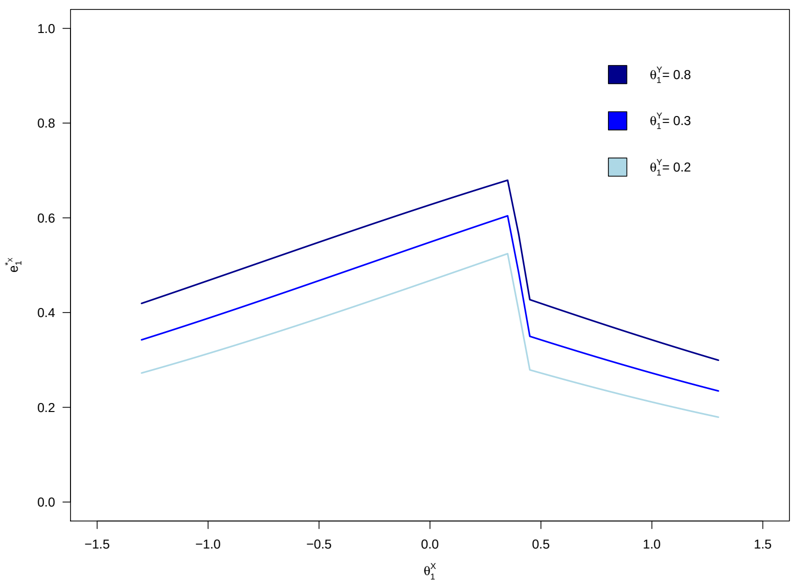
Using these parameter values, Figure 1 shows how Party 1's equilibrium emphasis on issue X depends on its positions on each issue. Recall that Party 1's optimal choice $e_1^{\star X}$ depends on ψ_1^X and ψ_1^Y and, therefore, on both parties' positions on both issues. In Figure 1, we fix Party 2's position on both issues X and Y at $0.4 = \theta_2^X = \theta_2^Y$. On the x-axis, we allow Party

24. In particular, the functional form (H.1) implies η is increasing and concave, with $\eta(0) = 1$ and $\eta(1) = \alpha$, and $\eta'(1) = 0$. With $\tau = 0.3$, $\eta'(0) = 1.3\alpha$ and $\eta'(0.8) = 0.8\alpha$, so $\eta(\cdot)$ is close to linear.

1's position, θ_1^X, to vary over the interval $[-1.3, 1.3]$. The three lines in the figure show $e_1^{\star X}$ when Party 1's position on issue Y is -0.8, -0.3 and 0.2.

Figure 1 reveals that Party 1 emphasizes issue X more as its position moves rightwards, closer to the position of Party 2, until, at $\theta_1^X \simeq 0.39$ it is only slightly more centrist that Party 2 on this issue. Beyond this point, further shifts to the right reduce Party 1's emphasis on issue X. This pattern arises because Party 1's has a greater desire to increase the salience of issue X when it's position on this issue has greater potential to attract votes. Party 1's position on issue X has the greatest potential to win votes when the party is slightly closer to the median voter than Party 2 on this issue, since the majority of voters will prefer Party 1's position on issue X in this case. As a consequence, Party 1 emphasizes issue X most when it is just to the left of Party 2 on this issue. Similarly, Figure 1 shows that Party 1 emphasizes issue X less and emphasizes issue Y more as its position on issue Y moves rightwards and closer to the position of Party 2. This is because Party 1's position on issue Y is most electorally advantageous when it is slightly closer to the median voter than Party 2 on this issue. Importantly, Figure 1 shows that Party 1 tends to choose $e_1^{\star X}$ between 0.2 and 0.65 at almost any position it could hold. This indicates that, at these parameter values, the revelation incentive is sufficiently powerful that Party 1 prefers to emphasize both issues to a significant degree, rather than focus overwhelmingly on one issue.

Figure 1: Party 1's Equilibrium Emphasis on Issue X as its Position Varies



Using the same parameter values, Figure 2 shows how Party 1's equilibrium emphasis on issue X changes as Party 2's position on issue Y changes. The x-axis shows Party 1's position on issue X as before. However, we fix Party 1's position on issue Y at -0.4 and fix Party 2's position on issue X at 0.4. The three lines in the figure instead show $e_1^{\star X}$ when Party 2's position on issue Y, θ_2^Y is $-0.2, 0.3$ and 0.8. The figure shows that when $\theta_2^Y = -0.2$, at which point Party 2 is slightly more centrist than Party 1 on issue Y, Party 1 chooses to emphasize issue X relatively more. This is because most voters who care about issue Y will prefer Party 2's position on this issue, leading Party 1 to wish to decrease the salience of issue Y, and increase the salience of issue X. However, the figure shows that if Party 2's position on issue Y moves rightwards, Party 1 tends to emphasize issue X less and emphasize issue Y more, since it is relatively easier for Party 1 to pick up votes on issue Y in this case.

Figure 2: Party 1's Emphasis on Issue X as Party 2's Position on Y Varies

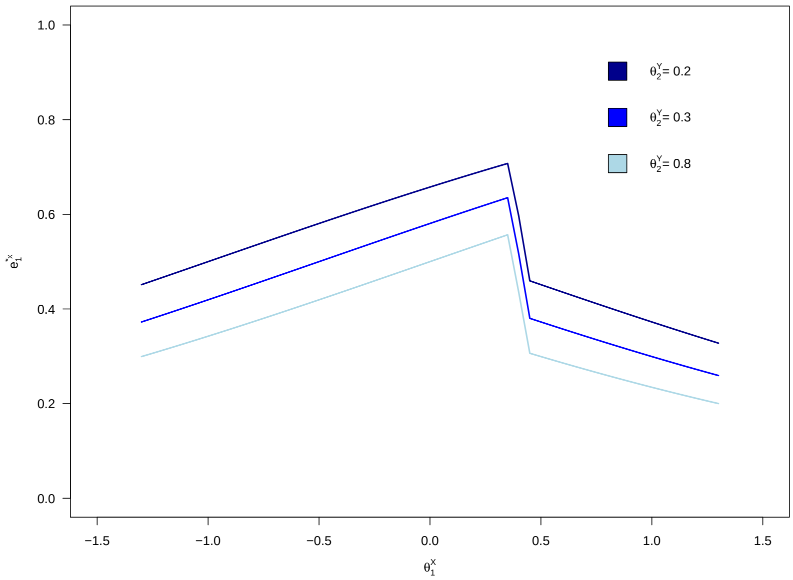


Figure 3 shows how Party 1's emphasis on issue X changes as the value of $\overline{\pi}_X$ changes, holding all other parameters constant at their baseline values. As with the previous figures, the x-axis shows Party 1's position on issue X. Party 1's position on issue Y is fixed at -0.4, and Party 2's position on each issue is fixed at 0.4. The figure shows that when $\overline{\pi}_X$ increases, Party 1's equilibrium emphasis on issue X increases. This is because the greater the number of X-focused voters, the more important it is for Party 1 to ensure that these voters observe its position on issue X, leading it to increase emphasis on X. When $\overline{\pi}_X$ reaches 0.65, we find that Party 1 tends to emphasize issue X almost exclusively, regardless of its position on the issue. This is consistent with Proposition 5 above. Figure 4 is similar to Figure 3, except that that Figure 4 shows how Party 1's emphasis on issue X changes as the value of $\overline{\pi}_Y$ changes. As $\overline{\pi}_Y$ increases, the number of Y-focused voters increase, making it more important for Party

1 to ensure that these voters observe its position on issue Y. Consequently, as $\overline{\pi}_Y$ increases, Party 1 increases its relative emphasis on issue Y and decreases its relative emphasis on issue X.

Figure 3: Party 1's Emphasis on Issue X as $\overline{\pi}_X$ Varies

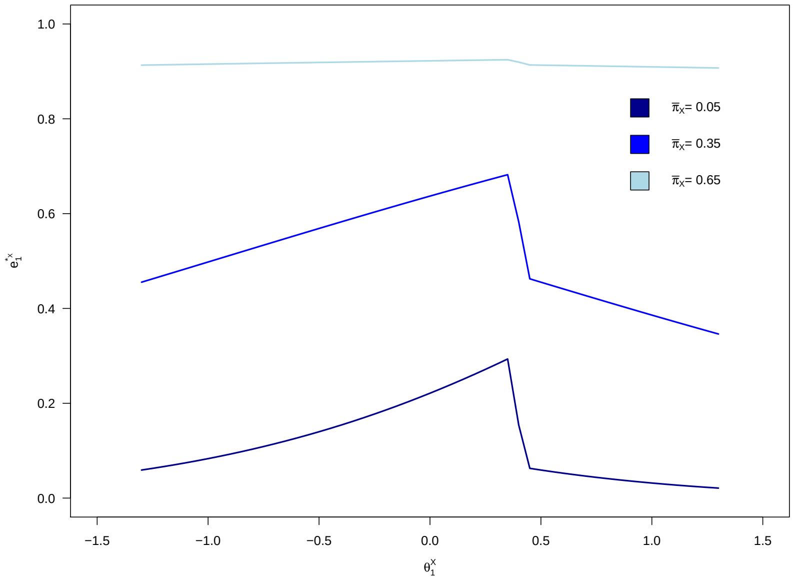


Figure 4: Party 1's Emphasis on Issue X as $\overline{\pi}_Y$ Varies

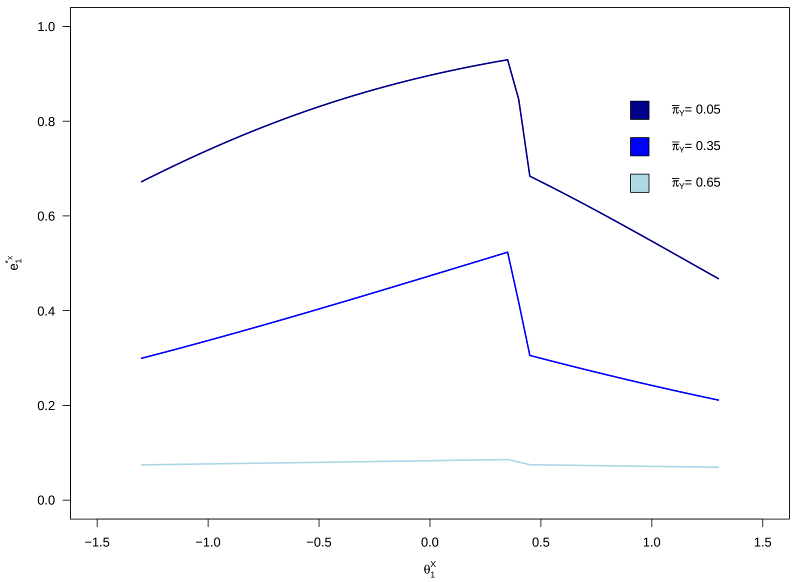
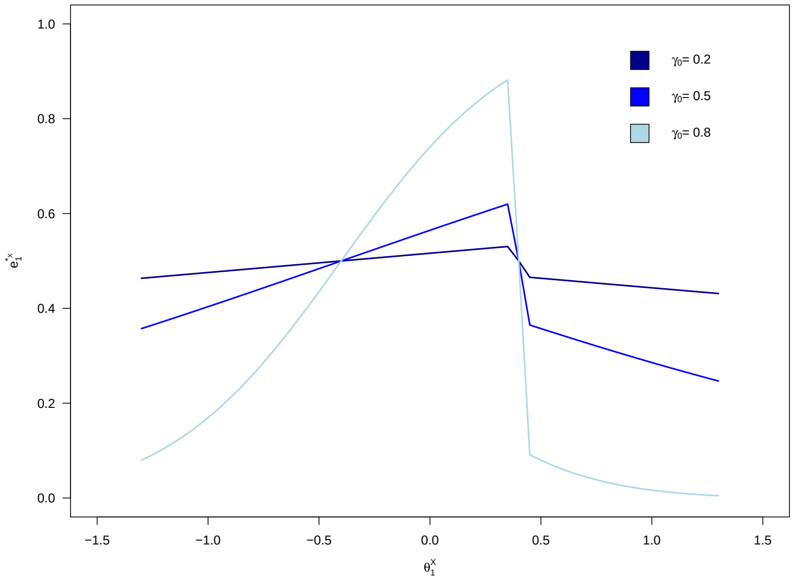


Figure 5: Party 1's Emphasis on Issue X as γ_0, γ_1 Vary



The final figure, Figure 5 shows how Party 1's emphasis on issue X changes as γ_0 and γ_1 change. Again, the x-axis shows Party 1's position on issue X, Party 1's position on issue Y is fixed at -0.4, and Party 2's position on each issue is fixed at 0.4. In the figure, we set $\gamma_1 = \gamma_0$, but allow γ_0 to vary, holding other parameters constant at their baseline values. The three lines show Party 1's optimal emphasis on X when γ_0 and γ_1 are both equal to 0.2, 0.5 and 0.8. Figure 5 shows that, when γ_0 and γ_1 are close to zero, Party 1 places close to 0.5 emphasis on issue X, regardless of its position. On the other hand, when γ_0 and γ_1 are closer to 1, Party 1 is increasingly inclined to place little emphasis on X when its position on X is extreme and to place a lot of emphasis on X when its position on X is close to the median voter. The reason for this is that the revelation incentive is weaker when γ_0 and γ_1 are larger, as explained in the discussion of Proposition 3. Therefore, when γ_0 and γ_1 are close to zero, the revelation incentive is very powerful. This incentive leads parties to emphasize both issues to a similar degree, to increase the chance that voters observe their positions. On the other hand, when γ_0 and γ_1 are closer to 1, voters are likely observe parties' positions regardless of what the parties do and so the revelation incentive is weak. Then, the main relevant incentive for the parties is the salience effect of campaigns. The salience effect of campaigns encourages Party 1 to emphasize issue X if and only if its position on X is more electorally advantageous than its position on Y. Therefore, it emphasizes issue X strongly when it is relatively near the median voter on this issue, but not otherwise.

I If Voters Maximise Expected Utility

We now discuss the assumptions of the model with voters that maximise expected utility. This is completely identical to the model discussed in the main text with one two exceptions. The first exception is that we specify that nature chooses the parties' positions at the start of play according to the cumulative distribution function G, so that

$$\text{Prob}(\theta_1^X \leq x_1, \theta_1^Y \leq y_1, \theta_2^X \leq x_2, \theta_2^Y \leq y_2) = G(x_1, x_2, y_1, y_2)$$

Furthermore, we assume that G is symmetrical across parties, so that, for any x_1, x_2, y_1, y_2:

$$G(x_1, x_2, y_1, y_2) = G(x_2, x_1, y_2, y_1)$$

The second exception is that we assume that voters are expected utility maximising rather than ambiguity averse. As before, some voters are issue X-focused, some are issue Y-focused and some are impressionable. Again, as before, the fraction of voters that are of each type, and who observe no, one or both parties' positions on an issue are given by the variables ρ_0, ρ_j^{KF}, ρ_j^{KI}, ρ_B^{KF} and ρ_B^{KI} which are defined by equations (1)-(5). However, since voters maximise expected utility, a voter who observes only party j's position on issue X votes for party j if and only if:

$$U(|x_i - \theta_j^X|) \geq \int_{\hat{\theta}_{\neg j}^X \in \Theta} U(|x_i - \hat{\theta}_{\neg j}^X|) d\mu_i(\hat{\theta}_{\neg j}^X | \theta_j^X)$$

where

$$\mu_i(\hat{\theta}_{\neg j}^X | \hat{\theta}_j^X) = \text{Prob}(\theta_{\neg j}^X \leq \hat{\theta}_{\neg j}^X | \text{Voter } i \text{ observes only } \theta_j^X = \hat{\theta}_j^X) \tag{I.1}$$

with an analogous expression for issue Y.

Our assumptions imply that, for each issue K, $\mu_i(\hat{\theta}_{\neg j}^K | \hat{\theta}_j^K)$ is the same for all voters i, given $\hat{\theta}_{\neg j}^K$ and $\hat{\theta}_j^K$. To demonstrate this, assume first that voter i is an issue-K-focused voter. Applying Bayes's rule to equation (I.1) reveals that $\mu_i(\hat{\theta}_{\neg j}^K | \hat{\theta}_j^K)$ is in this case equal to:

$$\mu_i(\hat{\theta}_{\neg j}^K | \hat{\theta}_j^K) = \frac{\int_{\{\theta \in \Theta : \theta_j^K = \hat{\theta}_j^K, \theta_{\neg j}^K \leq \hat{\theta}_{\neg j}^K\}} \rho_j^{KF}(\theta) dG(\theta)}{\int_{\{\theta \in \Theta : \theta_j^K = \hat{\theta}_j^K\}} \rho_j^{KF}(\theta) dG(\theta)} \tag{I.2}$$

Here, we write $\rho_j^{KF}(\theta)$ to denote the fact that ρ_j^{KF} depends on parties' emphases e_1^X, e_1^Y, e_2^X, e_2^Y, which in turn depend on parties' positions θ.

Now, suppose that voter i is an impressionable voter. Applying Bayes's rule to equation

(I.1) reveals that $\mu_i(\hat{\theta}^K_{\neg j}|\hat{\theta}^K_j)$ is in this case equal to:

$$\mu_i(\hat{\theta}^K_{\neg j}|\hat{\theta}^K_j) = \frac{\int_{\{\theta\in\Theta:\,\theta^K_j=\hat{\theta}^K_j,\,\theta^K_{\neg j}\leq\hat{\theta}^K_{\neg j}\}} \rho^{KI}_j(\theta)dG(\theta)}{\int_{\{\theta\in\Theta:\,\theta^K_j=\hat{\theta}^K_j\}} \rho^{KI}_j(\theta)dG(\theta)} \tag{I.3}$$

From equations (1) and (2) in Section 2.3, it follows immediately that

$$\rho^{KI}_j(\theta) \equiv \left(\frac{1-\overline{\pi}_X-\overline{\pi}_Y}{2\overline{\pi}_K}\right)\rho^{KF}_j(\theta)$$

As such, the right hand side of equation (I.3) is always equal to the right hand side of equation (I.2). Thus, it follows that $\mu_i(\hat{\theta}^K_{\neg j}|\hat{\theta}^K_j)$ is the same for all voters i, given $\hat{\theta}^K_{\neg j}$ and $\hat{\theta}^K_j$.

For each $j\in\{1,2\}$ and $K\in\{X,Y\}$, we let ϕ^K_j denote the proportion of the voters who only observed party j's position on issue K that choose to vote for party j. In the model in the main text, with ambiguity averse voters, it was effectively assumed that $\phi^K_j=1$ since all voters who only observe party j's position were assumed to vote for party j. When voters maximise expected utility, this is no longer the case. Instead, ϕ^X_j is given by:

$$\phi^X_j = \int_{-\infty}^{\infty} \mathbf{1}\left\{U(|x_i-\theta^X_j|) \geq \int_{\hat{\theta}^X_{\neg j}\in\Theta} U(|x_i-\hat{\theta}^X_{\neg j}|)d\mu(\hat{\theta}^X_{\neg j}|\theta^X_j)\right\} f_X(x_i)\partial x_i \tag{I.4}$$

with an analogous expression for issue Y. Here, we omit the i subscript in $\mu_i(\cdot|\cdot)$, since this is the same for all voters i.

This completes the description of voters who observe the position of only one party. Other voters behave in exactly the same way as in the model in the main text. Voters who observe both parties' positions on an issue maximise their expected utility by voting for the party whose position is closest to their own. Therefore the proportion of such voters that vote for a particular party j is given by ψ^X_j and ψ^Y_j, which are described in equations (9) and (10) in the main text. As before, we assume that voters who observe neither party's position vote for each party with probability one half. This maximises the expected utility of such voters, since their expected utility of voting for each party is equal.[25]

As before, a party's strategy s is a mapping from party positions θ to issue emphases, and we let $V_j(\theta,s)$ denote party j's vote share given positions θ and party strategies. Our assumptions imply that, in the case of expected utility maxmising voters, $V_j(\theta,s)$ is given by:

$$V_j(\theta,s) = \frac{\rho_0}{2} + \sum_{K\in\{X,Y\}} (\rho^{KF}_B\psi^K_j + \rho^{KI}_B\psi^K_j + \rho^{KF}_j\phi^K_j + \rho^{KI}_j\phi^K_j) \tag{I.5}$$

25. Naturally, one could assume that all such voters break their indifference in favour of one party, rather than by voting for each with probability one half. However, the case we consider here seems the natural one to focus on.

which replaces the equation (11) used in the model with ambiguity averse voters.

In the model with expected utility maximising voters, we define an equilibrium as a strategy profile s for the parties, a voter belief function μ and a value of ϕ_j^K for each $K \in \{X, Y\}$, $j \in \{1, 2\}$ and for each $\theta \in \Theta$, such that:[26]

1. Each ϕ_j^K is consistent with equation (I.4) (and an analogous equation for issue Y), given μ.
2. μ is consistent with equation (I.2) given parties' emphasis strategies.
3. Each party's strategy maximises its vote share V_j, given by (I.5), given the strategy of the other party, and given the values of ϕ_j^K.

I.1 Numerical Examples

We were not able to obtain a complete analytical characterisation of the equilibrium when voters maximise expected utility. Instead, we present numerical results for various parameter values, as was done in Appendix H for the model with ambiguity averse voters. The model equilibrium appears to be unique for all the parameter values we have considered.

In general, we use the same baseline parameters as in Appendix H. As in Appendix H, we assume a uniform distribution of voters over the square $[-1, 1]^2$ and assume that η takes the functional form given in equation (H.1). Furthermore, we assume, as in Appendix H, that

$$\begin{aligned} \gamma_0 = \gamma_1 &= 0.5 \\ \overline{\pi}_X = \overline{\pi}_Y = \alpha = \tau &= 0.3 \end{aligned}$$

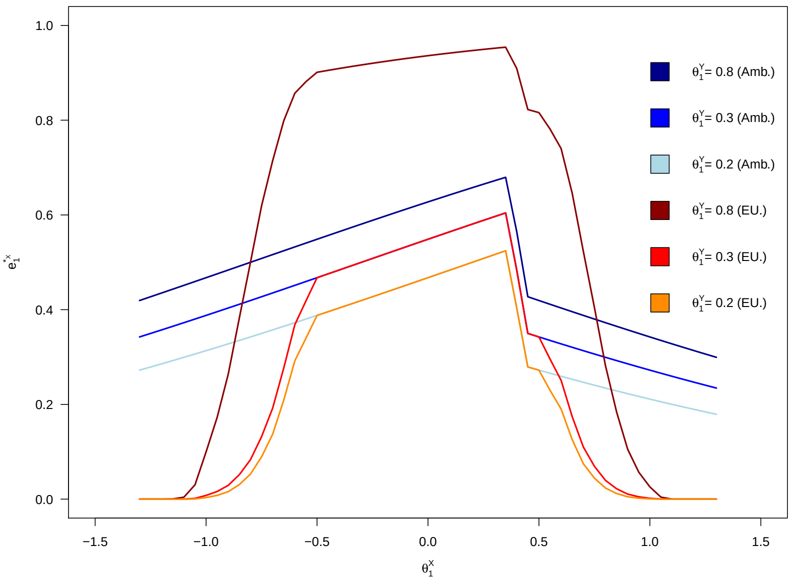
When voters maximise expected utility, there are several more parameters that must be determined. It is necessary to fix the utility function of voters and the distribution G from which parties' positions are chosen by nature. We assume that the voter utility function satisfies $U(x) = -x^2$ and that the distribution G is uniform over the square $[-2, 2]^2$. These choices imply that voters have some risk aversion (in the sense that U is strictly concave) and that voters have quite a high degree of uncertainty, ex ante, about parties' positions. These assumptions are important for the revelation incentive to have much power in the model when voters maximise expected utility. If instead voters had no risk aversion, or were reasonably certain about the positions that parties would adopt ex ante, then many voters may choose to

26. The definition of equilibrium employed here is exactly the definition of a Perfect Bayesian Equilibrium of the game where nature chooses party positions, parties choose emphasis and then voters vote, except that we restrict attention to Perfect Bayesian Equilibria in which indifferent voters vote for each party with probability one-half.

vote for a party even if they do not observe its position on an issue directly. In that case, the revelation incentive would be weak or non-existent.[27]

Starting from these baseline parameters, Figures 6-10 replicate Figures 1-5 from Appendix H but consider the case of expected utility maximising voters. For convenience, Figures 6-10 also include the case of amibiguity averse voters, for which the results are the same as in Figures 1-5. Inspection of the figures indicates that the model with expected utility maximising voters implies identical equilibrium behaviour to the model with ambiguity averse voters, provided that party positions are not too extreme – that is, roughly, provided $\theta_j^K \in [-0.6, 0.6]$ for each $K \in \{X, Y\}$ and $j \in \{1, 2\}$. By contrast, when parties take much more extreme positions, the model with expected utility maximising voters implies that each party chooses to emphasize only one issue in its campaigns. That is, they set $e_j^K = 1$ for one issue and $e_j^{\neg K} = 0$ for the other issue. Indeed, we find that when party positions are outside the interval $[-1.3, 1.3]$—not shown in the figures—parties choose to emphasize only one issue in campaigns in virtually all cases.

Figure 6: Party 1's Emphasis on Issue X as its Position Varies, Expected Utility-Maximizing vs. Ambiguity-Averse Voters



To understand intuitively where the results for the model with expected utility maximising voters come from, Figure 11 plots the equilibrium value of ϕ_1^X for different positions θ_1^X of

27. As such, we find that if we set U to have very little curvature (e.g. $U(x) = |x|^1.1$) or if we reduce the variance of G (for instance, setting G to be uniform over the square $[-0.5, 0.5]^2$)- then parties choose to emphasize only one issue in equilibrium for virtually all party positions. That is, they set $e_j^K = 1$ for one issue and $e_j^{\neg K} = 0$ for the other issue. This closely resembles results from most previous models of party issue emphasis, in which the revelation incentive was not present.

Figure 7: Party 1's Emphasis on Issue X as Party 2's Position on Y Varies, Expected Utility-Maximizing vs. Ambiguity-Averse Voters

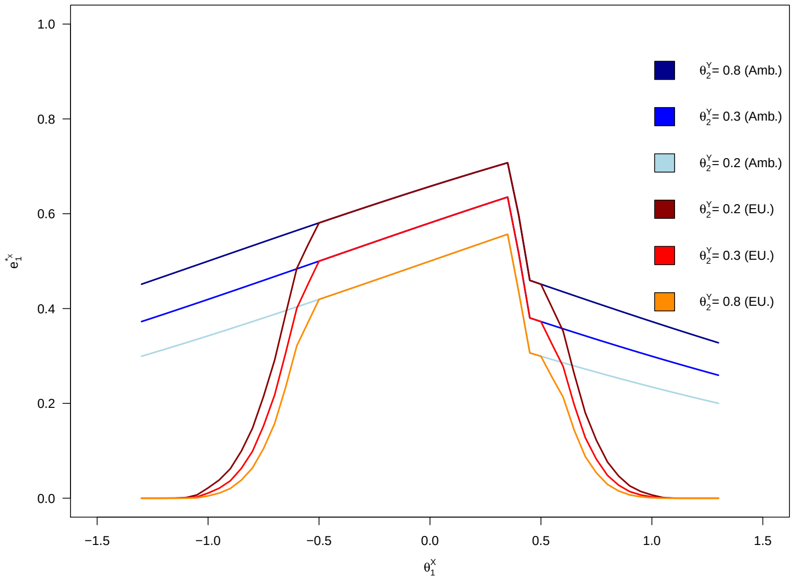


Figure 8: Party 1's Emphasis on Issue X as $\overline{\pi}_X$ Varies, Expected Utility-Maximizing vs. Ambiguity-Averse Voters

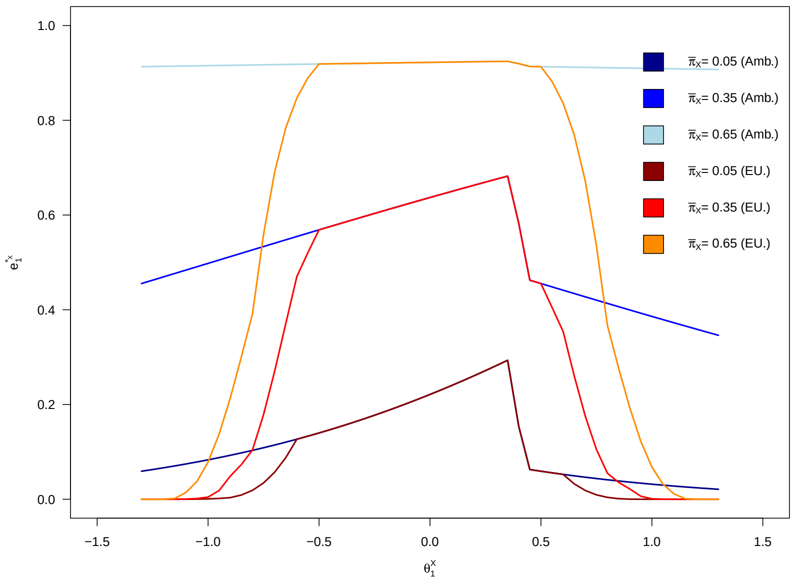


Figure 9: Party 1's Emphasis on Issue X as $\overline{\pi}_Y$ Varies, Expected Utility-Maximizing vs. Ambiguity-Averse Voters

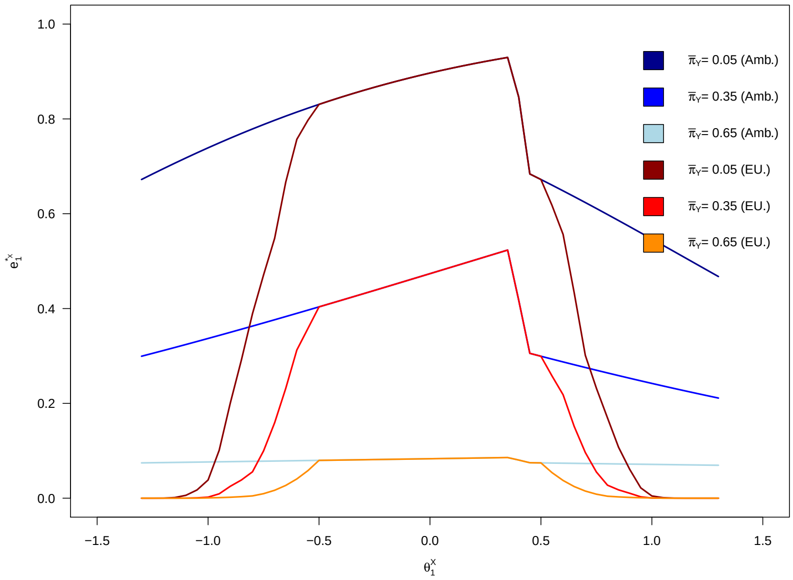


Figure 10: Party 1's Emphasis on Issue X as γ_0, γ_1 Vary, Expected Utility-Maximizing vs. Ambiguity-Averse Voters

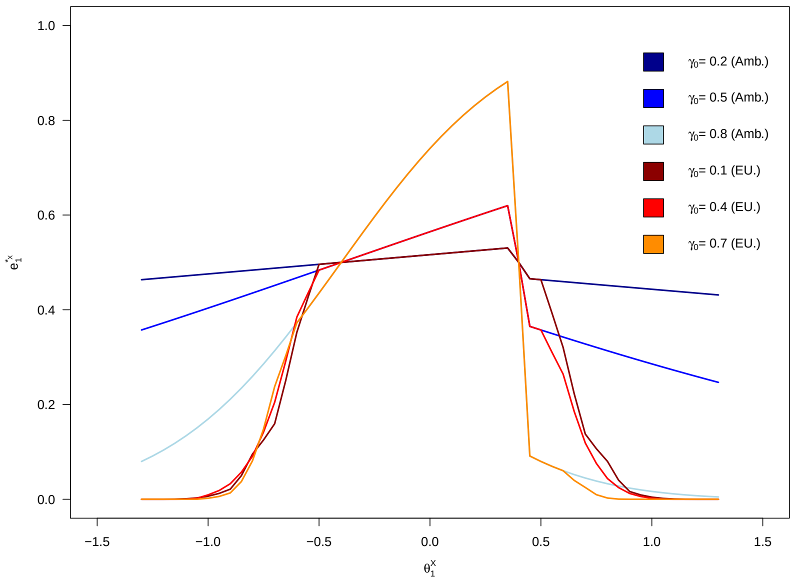
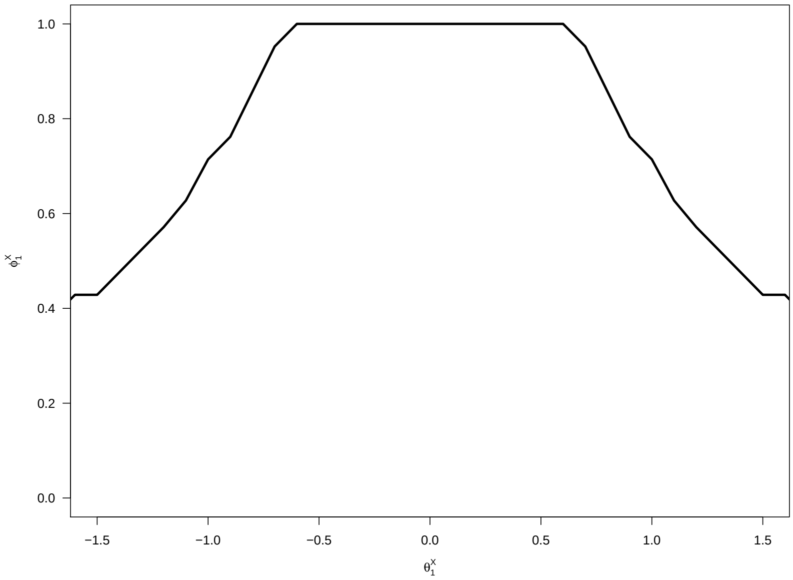


Figure 11: Φ_1^X as θ_1^X varies, with Expected Utility-Maximizing Voters



Party 1, at the baseline parameter values. When θ_1^X is close to zero, we find that $\phi_1^X = 1$. That is, in these cases, all voters who observe only Party 1's position on issue X choose to vote for that party. This is exactly the same as what occurs when voters are ambiguity averse. Therefore, it is no surprise that the equilibrium of the model with expected utility maximising voters is the same as with ambiguitiy averse voters for party positions close to zero. On the other hand, when θ_1^X is far from zero, we find that $\phi_1^X < 0.5$. That is, if Party 1 has a position far from zero, the majority of voters who see only its position still choose to vote for Party 2, out of a belief that Party 2's position is unlikely to be as extreme as Party 1's. In these cases, the revelation incentive for Party 1 on issue X is non-existent: Party 1 has no incentive to reveal its position on issue X because the more voters observe its position the more they will be repelled. In the absence of a revelation incentive, party strategies are based upon the salience effect of campaigns: parties choose to focus entirely on the issue on which they are most popular, in order to increase the salience of this issue.