

## Ambiguous Platforms and Correlated Preferences: Experimental Evidence

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**T**his paper studies, theoretically and experimentally, a model of electoral competition that allows for platforms where candidates may be ambiguous about which policy they will implement if elected.

We argue that uncertainty about the policy preferences of the electorate, combined with perceived similarity of voters and candidates, can lead to the latter running on these ambiguous platforms. By appealing to voters from both ends of the spectrum, such platforms can ensure electoral success for noncentrist candidates in a sufficiently polarized society. Ambiguous platforms pose a threat to democratic representation because winning noncentrists always implement policies in favor of a minority and against the preferences of the majority. In our laboratory experiment, ambiguous platforms are chosen frequently by candidates and gain notable support from voters. Our main treatment variation provides causal evidence that ambiguous platforms are more popular among noncentrist voters if one of the candidates is a known centrist.

### INTRODUCTION

**P**oliticians often campaign with *ambiguous platforms*, which fail to fully specify what policy will be implemented if the candidate is elected.<sup>1</sup> Ambiguous platforms are particularly prominent among antiestablishment candidates or political outsiders, who typically campaign against the policies of mainstream parties rather than for a particular policy of their own. Although voters who support an ambiguous outsider may be confident of a shift from the status quo, they remain uncertain about the size or even direction of this shift. A notable example for this type of campaigning is the Brexit referendum: a vote for Remain was clearly a vote for the *status quo*, whereas a vote for Leave could result in a shift to the left on many issues (e.g., looser rules on state intervention) or the right (e.g., fewer worker protections). Pro-Brexit campaigners often focused on “taking back control,” rather than clearly specifying which policies would be implemented with

increased independence.<sup>2</sup> Recent elections have seen a surge in anticentrist platforms, which were not only vague on some issues but also often clearly self-contradictory. Donald J. Trump, for example, followed this approach in his 2016 US presidential election campaign.<sup>3</sup> The systematically ambiguous campaigning ran from foreign to national policy issues and led even conservative observers to assert that “Trump favors strategic ambiguity—on everything.”<sup>4</sup> Although candidates are well known to favor vagueness on specific issues to increase their appeal to diverse groups of voters (Bräuninger and Giger 2018; Rogowski and Tucker 2018; Somer-Topcu 2015; Tomz and Van Houweling 2009), the precise mechanisms behind the success and popularity of ambiguous platforms remain unclear.

In this paper, we posit a novel theoretical explanation for ambiguous platforms and use a laboratory experiment to test its main behavioral predictions and primary assumptions.<sup>5</sup> We argue that in a sufficiently polarized society, campaigning with ambiguous platforms can be a viable strategy for antiestablishment candidates to win broad support, even if voters dislike the uncertainty ambiguous platforms bring about. In fact, it is sometimes the only possible way for a

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<sup>1</sup> In line with the earlier political science literature starting from Shepsle (1970; 1972), we use the term *ambiguous platforms* to refer to political platforms that do not clearly specify which policies will be implemented if the candidate wins the elections rather than ambiguity in the sense of Knightian uncertainty (Knight 1921).

<sup>2</sup> See, for example, Anand Menon. “We Still Don’t Know What or Who Brexit is Actually for.” *Independent*, June 3, 2021.

<sup>3</sup> For instance, he stated on March 21, “I see NATO as a good thing to have” only to flip six days later to the complete opposite statement of “I think NATO is obsolete.” *Washington Post*, March 21, 2016 and “‘This Week’ Transcript.” *ABC News*, March 27, 2016, respectively.

<sup>4</sup> Rich Lowry. “Trump Wants to Make a Deal.” *National Review*, May 13, 2016.

<sup>5</sup> All experiments of this project were preregistered in the AEA RCT Registry, available at <https://doi.org/10.1257/rct.2799-1.0>, and approved by the VCEE, see Tolvanen, Tremewan, and Wagner (2021).

noncentrist to win the election. Our results rest upon the assumption that the political preferences of voters and candidates are correlated, or at least perceived to be so. In the context of our model, this correlation essentially means that it is unknown whether leftist or rightist voters outnumber the other, but candidates are more likely to share the political preferences of whichever side does so.<sup>6</sup> This can lead voters with very different preferences to each believe that a vote for an ambiguous candidate is a vote for their own favored policy. As a result, a *majority* of voters, some of whom voted for the ambiguous candidate, will inevitably be disappointed with the implemented policies, even if voters make the best possible decisions given the information they have at the time. Therefore, ambiguous platforms can severely hamper majoritarian policy making in democratic elections.

To formalize the idea behind our explanation of ambiguous platforms, we use a game-theoretic model of electoral competition based on Tolvanen (2020) to show that such platforms can arise from the strategic interaction of fully rational candidates and voters. A more subtle implication of the theory is that ambiguous platforms are more likely to arise when one of the candidates is known to favor centrist policies. The model's main innovation is the assumption that there is uncertainty about the exact distribution of policy preferences in society, but that this unknown distribution is shared by candidates and voters alike. This correlation of preferences results in each voter believing that an ambiguous candidate most likely shares her political views.<sup>7</sup> In the model, these beliefs are the result of Bayesian updating by rational voters, based on private information about their own preferences or the preferences of a close-knit political community, but they can also be caused by behavioral biases such as the (false) consensus effect (Jensen 2009; Ross, Greene, and House 1977).

To understand the intuition behind our theoretical results, consider a situation where both left- and right-leaning candidates are expected to run on an ambiguous noncentrist platform. A leftist voter observing an ambiguous noncentrist platform believes, due to correlated preferences, that the candidate is also more likely to have left-leaning rather than rightist preferences, with right-leaning voters updating symmetrically. As a result, the candidate is perceived by all

noncentrist voters as relatively more likely to implement their favorite policy. Thus, correlated preferences can lead to noncentrist, antiestablishment candidates overturning the classic median-voter theorem by committing to implement noncentrist policies and attracting voters from both the left and the right. The model also clearly demonstrates how ambiguous platforms can reduce support for democratic processes by inevitably disappointing many of the supporters of the winning candidate and undermining the ability of elections to deliver policies that satisfy the majority of voters.

We test the model's main behavioral predictions and assumptions in a laboratory experiment (Morton and Williams 2010; Woon 2018) to lend evidence to our explanation of ambiguous platforms. A general difficulty previous empirical studies face is that they inevitably focus on different "equilibrium" outcomes, with little exogenous variation in the explanatory variables. For example, self-reported partisanship by voters is likely to be influenced by the platforms that have been proposed in the past by the existing parties, leading to potential reverse causality. In contrast, our theory-guided experimental approach provides control over the environment and exogenous variation in what is known about the competing candidates to identify causal effects on behavior. Specifically, our model suggests that ambiguous platforms are particularly appealing when one of the candidates can be relied on to run on a centrist platform, much like in recent elections where outsider candidates have been successful against mainstream centrists whose political views are well known. Our experiment provides causal evidence for this theoretical prediction by comparing behavior in two treatments that only differ in what is known about the preferences of the two competing candidates. In the baseline (BL) treatment, two candidates of unknown political preferences compete for electoral support. In the known centrist (KC) treatment, only one candidate has unknown preferences, whereas her electoral competition will implement a centrist platform with certainty.

Finally, our equilibrium predictions assume a high degree of strategic sophistication as well as an understanding of the correlation between voter and candidate preferences. To account for the fact that many people are not fully rational decision makers (cf. Ashworth and Bueno de Mesquita 2014; Ashworth, Bueno de Mesquita, and Friedenberg 2018) we elicited two individual-level characteristics that are implicitly assumed in our theoretical analysis but experimental subjects often fail to exhibit: the ability to understand correlations (Enke and Zimmermann 2019) and to reason strategically (Agranov, Caplin, and Tergiman 2015; Agranov et al. 2012; Nagel 1995).<sup>8</sup> Observed variation across individuals in these behavioral

<sup>6</sup> Although we use examples from the political left–right spectrum in this paper for ease of exposition, the logic behind our argument is generic and applies to any issue with at least three policies (here left, right, and centrist) and sufficient preference heterogeneity.

<sup>7</sup> Preferences can be correlated in society for at least two reasons. First, socioeconomic forces that cause volatility in electoral preferences are likely to affect voters' and politicians' policy preferences alike. An immigration shock, for example, can lead to very different shifts of preferences on immigration policy for voters and candidates from urban versus rural areas (Maxwell 2019). Second, exposure to social and personalized media, echo chambers, and other forms of information bubbles are known to cause an exaggerated sense of preference similarity and thereby contribute to the polarization of society (Goel, Winter, and Watts 2010; Levy 2021; Levy and Razin 2019).

<sup>8</sup> Ortoleva and Snowberg (2015) show that imperfect information processing, by not taking the correlation between information sources (media) into account, can lead to polarization in opinions and ideological party identification. For evidence on how correlated information sources, e.g., from correlated news outlets, can distort belief formation, see also Enke and Zimmermann (2019).

measures allows us to further examine the posited mechanism underlying the attractiveness of ambiguous strategies.

The results from our laboratory experiment provide clear evidence that candidates run on ambiguous platforms and that these platforms receive substantial support from voters. On average, noncentrist candidates run on ambiguous platforms about 30% of the time. Candidates choosing noncentrist ambiguous platforms gain on average 54–63% of the noncentrist voters' votes, depending on the treatment, which is indicative of ambiguous platforms being fairly common and popular. Regarding the main treatment effect, we find that voters support ambiguous candidates significantly more often when the other candidate is a known centrist. The propensity to vote for ambiguous policies is particularly strong for voters who are able to reason strategically (73% for strategically sophisticated and 55% of unsophisticated in treatment KC). On average, we do not find that candidates take advantage of the increased support of ambiguous platforms in the KC treatment compared with the BL treatment. However, noncentrist candidates who display an understanding of correlations in our independent measure do run significantly more often on ambiguous platforms in the KC treatment (46% for correlation aware and 20% for correlation unaware). We explain the observed asymmetry in the theoretically motivated sophistication measures across candidates and voters in a model extension in the Appendix.

## RELATED LITERATURE

Vagueness or ambiguity in political campaigning has spurred a number of theories that rationalize ambiguous platforms since Downs (1957a; 1957b). Early contributions require risk-seeking preferences of voters to support ambiguous platforms (Aragones and Postlewaite 2002; Glazer 1990; Page 1976; Shepsle 1970; 1972) or appeal to behavioral assumptions such as context-dependent preferences of voters (Callander and Wilson 2008). Compared with these papers, we show that ambiguity can arise even with rational and risk averse agents. In other words, behavioral biases or uncommon risk preferences are not necessary for explaining the ubiquity of ambiguous platforms. In our model, which shares the assumption regarding the correlation of preferences with Goeree and Grosser (2007), citizens can infer from their own preference type the probability of candidates being of the same type. Consequently, ambiguous candidates can simultaneously appeal to opposing *risk-averse* and *rational* voter groups by not being clear about their policy preferences.

In another strand of the theoretical literature, ambiguity arises as a response to different dynamic concerns. Generally, ambiguity either serves as a way for the candidate to hide her true preferences in the early rounds of the game or allows politicians to readjust policies to future information. Prominent examples of the first group of papers include Alesina and Cukierman (1990), where politicians hold reelection concerns,

and Alesina and Holden (2008), who consider ambiguous platforms when there are campaign contributions that affect the position of the median voter. Examples of the second group of papers include Aragonés and Neeman (2000), Meirowitz (2005), and Kartik, Van Weelden, and Wolton (2017). In the first paper ambiguity allows candidates to react to arriving information about the most expedient policy; in the second, primaries convey information about the preferences of the electorate and in the last one ambiguous platforms allow politicians to adjust policies to future policy-relevant information. Our model explains ambiguity in situations where there are no external forces such as reelection concerns or anticipated arrival of policy-relevant information that motivate ambiguity.

To the best of our knowledge, our paper is the first to use a laboratory experiment guided by a theoretical model to identify causal forces that can generate ambiguous platforms. In general, empirical evidence for any of the above theoretical explanations for ambiguous policies is scant and existing empirical studies are only loosely guided by theory. Our experiment is closely related to the survey experiment of Tomz and Van Houweling (2009), which studies voter responses to ambiguous policies conditional on different levels of self-reported partisanship. Compared with hypothetical survey responses, we test equilibrium predictions of candidate and voter behavior with financially incentivized choices. To identify causal effects, we need to consider both sides of the strategic interaction simultaneously. Otherwise we cannot tell whether an increase in the prevalence of ambiguous strategies is ultimately due to a change in candidate or voter behavior, as each will affect the other. Furthermore, our experiment uses neutral framing (labeling) of policies to isolate the strategic decision-making process from effects driven by political connotations or partisanship that potentially blur the strategic incentives underlying ambiguous platforms.<sup>9</sup>

Somer-Topcu (2015) and Rogowski and Tucker (2018) investigate empirically how voters react to wide-appeal strategies of candidates and arrive at contradicting results regarding voter support (higher in the former and lower in the latter). Insights from our equilibrium model can explain these apparently contradicting findings. In particular, we show how the popularity of the wide-appeal strategy depends critically on the platform of the opposing candidate, the polarization of preferences, and the beliefs that voters hold about candidates. Milita, Ryan, and Simas (2014) evaluate the clarity of US House candidates' positions on the Iraq War and gay marriage and find, consistent with our model, that minority candidates are more likely to be ambiguous or silent on an issue compared with more popular candidates. Furthermore, they do not find support for their hypothesis that ambiguity should increase for minority candidates the more

<sup>9</sup> One could, of course, also incorporate real partisanship and policy positions in the experimental design (cf. Benoit, Laver, and Mikhaylov 2009; González Artiga and Granic 2020) within our framework.

salient the issue becomes on average. This can be explained within our model because what we predict to matter is how much the minority voters dislike the centrist position. If the centrists in our model rank an issue very low on importance, the average salience can remain low while noncentrist candidates may still find it appealing to choose an ambiguous stance. Supporting this idea, Bräuninger and Giger (2018) use electoral manifesto data from European parties to show that platforms become more ambiguous when preferences in the population diverge. Similarly, Han (2020) provides empirical evidence for a number of European countries that candidates campaign more ambiguously if their own supporters are polarized on an issue, consistent with our theory. In summary, our model helps to organize many of the previous empirical findings on strategic ambiguity.

Finally, our study also contributes to the recently burgeoning behavioral literature on the effects of biased information processing on political behavior. Levy and Razin (2015a) demonstrate theoretically that the inability to understand the correlation between news sources can lead voters in elections to aggregate information better. In a related work, Levy and Razin (2015b) investigate conditions under which polarized opinions of voters lead to more extreme policies on the part of politicians. We show how neglecting correlations can influence elections not only through information aggregation (Levy and Razin 2015a; 2015b) but also through *preference* aggregation by potentially reducing the viability of ambiguous platforms.

## AMBIGUOUS PLATFORMS: THEORY AND HYPOTHESES

In this section we first lay out the game-theoretic model that provides the foundation for our laboratory experiment. We then state the hypotheses we will test, which are based on our theoretical predictions as well as behavioral considerations.

### Theory

Here we describe a model of electoral competition that allows for ambiguous platforms. It is based on Tolvanen (2020), simplified to make it amenable for implementation in a laboratory experiment while maintaining the primary theoretical insights that the original paper demonstrates, with less restrictive assumptions. We first give a detailed verbal description of the model and its implications, then we provide a formal exposition.

We begin with a citizen-candidate setup (Besley and Coate 1997; Osborne and Slivinski 1996) where two candidates drawn from the general population compete for votes in a one-dimensional policy space. Each candidate's primary concern is implementing their preferred policy, outweighing the benefits of any perks of office. One of three possible policies can be implemented. For ease of exposition, we use the traditional political left–right spectrum and refer to these policies

as “leftist,” “centrist,” and “rightist.” However, the model applies more generally to any election where preferences over an issue can be ordered in a single dimension.

Preferences over the policies vary across the population: Noncentrist voters (and thus candidates) like their “own” policy the most and the policy of the other end of the spectrum the least. Centrists are assumed to strictly prefer the centrist policy over either noncentrist policy, and they are indifferent between left and right policies. Candidates can run on four possible platforms. They can guarantee to implement one of the three policies, or they can run on an ambiguous platform whereby they promise to implement a noncentrist policy without specifying whether it will be leftist or rightist. For simplicity, we assume that candidates make good on their promise.

A novel feature of the model is that citizens (both voters and candidates) are uncertain over the distribution of preferences in society and these preferences are correlated with each other. All citizens understand that society is polarized, in the sense that noncentrists outnumber centrists, but do not know whether leftists outnumber rightists or vice-versa. It is also known that neither leftists nor rightists hold a majority on their own. Voters only know for certain their own political preferences. Note that in the model we speak of individual voters, but these individual agents could equally represent cohesive groups, such as communities or networks of friends, who share political views. The correlation between voter and candidate preferences in our model comes from the fact that voter and candidate preferences are drawn from the same (uncertain) distribution.

A first important remark is that a centrist policy is best for society as a whole in the sense that a majority of voters prefers this over either of the other policies. Furthermore, a candidate running on a centrist platform will always win against a nonambiguous noncentrist platform, as the centrists will unite with the opposing noncentrists to form a simple majority. However, an ambiguous platform can beat a centrist platform. The reason for this is that voters rationally update their beliefs about whether leftists or rightists are in the majority by using their own preferences as information about the true distribution: if they have leftist/rightist preferences, Bayes' rule dictates that, given this information, it is more likely that leftists/rightists are in the majority. If all noncentrists believe that both leftist and rightist candidates run on ambiguous platforms, then they should believe that it is more likely that a candidate running on an ambiguous platform will share their own preferences and ultimately implement their preferred policy. Thus, the ambiguous platform gains support from both the left and the right.

If, as so far assumed, both candidates' true preferences are unknown, the model permits other possible outcomes. For example, it may be the case that voters believe that only one type of noncentrist candidate uses ambiguous platforms but the other type guarantees to implement her genuinely preferred policy. The idea that voters believe only candidates of opposite political

views use ambiguous platforms has a certain behavioral appeal if running on such a platform has negative connotations in the eyes of some voters. In this case, ambiguous platforms can still win on occasion but will be less common, less popular, and lose to a centrist platform. This motivates our treatment variation in the laboratory experiment. If one of the two candidates' preferences are known in advance to be centrist, the *only way* a noncentrist can win is by using an ambiguous platform. Therefore, we predict that ambiguous platforms will be more common and more popular in the presence of a known centrist candidate.

The model shows clearly that the use of ambiguous platforms has a negative effect on aggregate voter welfare. Compared with a situation where all candidates commit to a particular policy, only noncentrists with the same preferences as the ambiguous candidate benefit. Because, by assumption, centrists and one noncentrist group together always form a majority, voters who benefit from ambiguous platforms are always in a minority. Ambiguous platforms can thus considerably weaken democratic decision making and its ability to implement majoritarian preference aggregation. Additionally, a minority group that supported the winning ambiguous campaign will always feel deceived because they will see their least-preferred policy realized instead of the ambiguously "promised" preferred one. Consequently, successful ambiguous policies also undermine trust in democratic voting procedures for a significant fraction of voters.

**Formal Model: Players, preferences, and information.** There is a population of  $N$  voters and two candidates, with  $N$  being an odd number. Candidates and voters can be of three different types  $\tau \in \{-1, 0, 1\}$ . The type of a voter or candidate represents her most preferred policy.

We refer to preference type  $-1$  as "leftist," type  $0$  as "centrist," type  $1$  as "rightist," and sometimes call noncentrists simply "noncentrists."

Preferences of noncentrists are given by

$$u(a = -1, \tau = -1) = u(a = 1, \tau = 1) = 1,$$

$$u(a = 1, \tau = -1) = u(a = -1, \tau = 1) = 0, \text{ and}$$

$$u(a = 0, \tau = -1) = u(a = 0, \tau = 1) = u_0,$$

where  $a = \{-1, 0, 1\}$  is the *implemented* policy and  $u_0 \in (0, 1)$  captures how strongly the noncentrists, left or right, dislike the centrist policy as well as how risk-averse they are. For example, if  $u_0 > 1/2$ , then both rightist and leftist agents prefer the centrist policy to a 50/50 gamble between the two noncentrist policies. Preferences of centrists are given by

$$u(a = 0, \tau = 0) = u_1 > 0 \text{ and}$$

$$u(a = 1, \tau = 0) = u(a = -1, \tau = 0) = 0.$$

In state  $L$  ( $R$ ) a fraction  $p$  of the voters are leftists (rightists), a fraction  $q$  of the voters are rightists

(leftists), and the remaining  $1 - p - q$  voters are centrists. Assume  $0 < q < p < \frac{1}{2}$  and  $p + q > \frac{1}{2}$ , which guarantees that none of the three preference types holds a majority alone. The latter inequality implies also that united, supporters of opposing ends of the spectrum hold a simple majority.

The type of each candidate  $c \in \{1, 2\}$  is drawn from a distribution equivalent to the realized distribution of voters. To be precise, conditional on the state, candidate types are distributed independently according to

$$\mathbb{P}(\tau_c = -1|L) = \mathbb{P}(\tau_c = 1|R) = p,$$

$$\mathbb{P}(\tau_c = -1|R) = \mathbb{P}(\tau_c = 1|L) = q, \text{ and}$$

$$\mathbb{P}(\tau_c = 0|R) = \mathbb{P}(\tau_c = 0|L) = 1 - p - q.$$

Each candidate and voter learns her own type privately but does not know the realized state of world.

**Timing and decisions in voting game.** The timing of the game is given in Figure 2. First, nature chooses the state of the world and each citizen is assigned a preference type, which is private information. Then, both candidates simultaneously choose a platform from the set  $\mathcal{A} = \{-1, \{0\}, \{1\}, \{-1, 1\}\}$ . A singleton platform,  $A \in \{-1, \{0\}, \{1\}\}$ , represents a candidate's *commitment* to a particular policy, whereas the *ambiguous platform*,  $A = \{-1, 1\}$ , is deliberately vague about which of the two noncentrist policies the candidate will implement if she wins the election. A candidate who runs on an ambiguous platform only commits not to implement the status quo centrist policy in case of winning. After observing the proposed platforms, voters decide which candidate wins the election by simple majority voting. If the winning candidate ran with a singleton platform, that policy is implemented and the type-dependent utilities for voters and candidates are realized. If the winning candidate ran on an ambiguous platform, she chooses which policy  $a \in A = \{-1, 1\}$  is implemented.

**Results.** We use perfect Bayesian equilibrium to derive the theoretical predictions of the model that underlie our main experimental hypotheses; all proofs are relegated to the Appendix. Notice first that the following version of the standard Median Voter Theorem holds in our setting.

**Remark 1.** *If one candidate runs with platform  $A_1 = \{0\}$  and the other runs with  $A_2 \in \{-1, \{0\}, \{1\}\}$ , then the centrist policy is always implemented in any perfect Bayesian equilibrium.*

In other words, a noncentrist candidate (leftist or rightist) has no hope of winning by committing to a noncentrist policy against a centrist in our setup. The result follows simply because the centrists together with the opposing noncentrists will vote for the centrist candidate and these two groups form a simple majority (cf. Downs 1957b). In contrast, the main result from Tolvanen (2020) shows that rational noncentrist voters of both ends can unite behind an ambiguous candidate to beat a centrist opponent as long as the benefit from the centrist policy is not too high compared with the correlation between candidates' and voters'

preferences. Within our model, this insight can be stated as follows.

**Proposition 1.** *If  $u_0 < \frac{p^2+q^2}{(p+q)^2}$ , there exists a perfect Bayesian equilibrium where candidates of type  $\tau \in \{-1, 1\}$  choose the ambiguous platform  $A = \{-1, 1\}$  and all centrists run on  $A = \{0\}$ . In this equilibrium, an ambiguous noncentrist candidate always wins against a centrist one.*

If both types of noncentrist candidates are ex ante equally likely to play the ambiguous platform  $A = \{-1, 1\}$ , then, for example, a rational leftist voter (type  $\tau = -1$ ) faced with the choice between  $A = \{-1, 1\}$  and  $A = \{0\}$  would understand that, conditional on her preference type, the state of the world is more likely  $L$  than  $R$ . Because candidates' preferences are also correlated with the state, it follows that a leftist voter believes that an ambiguous candidate's type is more likely to be  $\tau = -1$  than  $\tau = 1$ . Now, the probability that the ambiguous candidate is a leftist conditional on the voter's type being  $\tau = -1$  is  $\frac{p^2+q^2}{(p+q)^2}$ . Thus, her expected utility from the ambiguous noncentrist is  $\frac{p^2+q^2}{(p+q)^2}$ , and as long as this is more than the guaranteed outside option  $u_0$  from the centrist policy, the leftist voter will vote for the ambiguous candidate. By symmetry, the same logic holds for rightist voters (type  $\tau = 1$ ), and thus both types of noncentrist voters will vote for the ambiguous candidate in equilibrium. For the same values of  $u_0$ , there exist also equilibria where all candidates play fully revealing strategies. This result is summarized in the following proposition.

**Proposition 2.** *For each candidate  $c \in \{1, 2\}$ , let  $\tau_c$  be the candidate's type. Then, each candidate committing to a truthful platform,  $A = \{\tau_c\}$ , is part of a perfect Bayesian equilibrium if  $u_0 \leq \frac{p^2+q^2}{(p+q)^2}$ , and this condition is tight if centrist voters have a strict preference over the two noncentrist policies. If this equilibrium is played and a candidate proposes the centrist platform, the centrist policy will be implemented.*

Similarly, all rightist (leftist) candidates playing  $A = \{-1, 1\}$  and all leftist (rightist) candidates playing  $A = \{-1\}$  ( $A = \{1\}$ , respectively, while centrists play  $A = \{0\}$ ), is consistent with a perfect Bayesian equilibrium under the same condition on  $u_0$ . All of these equilibria are outcome equivalent and vary only in the equilibrium path beliefs that voters attach to ambiguous platforms. The voters do not believe the ambiguity in the two latter equilibria but attribute that platform always to a fixed type. This, in turn, will discourage the candidates of the opposing type from choosing that platform because based on the correlation between their and the voters' type, they believe that it is more likely that a minority of the voters are of the opposing type who vote for the ambiguous platform.<sup>10</sup>

We now turn our attention to the restriction of the model we implement in our experiment as a treatment variation. Here, one candidate is known to be a centrist who always runs on a centrist platform, whereas the other is drawn from the same distribution as before. We refer to this as the Known Centrist (KC) treatment, as opposed to our Baseline (BL) treatment described above. Remark 1 and Proposition 1 hold also in treatment KC, which leads to the following corollary.

**Corollary 1.** *In case KC, in which the other candidate is known to be a truthful centrist—that is,  $\tau = A = \{0\}$ , the only way a noncentrist candidate can win is by committing to an ambiguous platform  $A = \{-1, 1\}$ . This is not true in case of BL, in which the preference type of the other candidate is unknown.*

In KC, being ambiguous equilibrium-dominates any other platform in the sense that for all equilibrium beliefs associated with the ambiguous policy, and conditional on the voters best responding with undominated strategies, the noncentrist candidate does at least as well by choosing the ambiguous platform  $A = \{-1, 1\}$  as any other platform, and there exist equilibrium beliefs where  $A = \{-1, 1\}$  does strictly better than any other (singleton) platform. Put differently, if it is known that there is a centrist who truthfully plays her preferred policy, then the only equilibrium where no one plays equilibrium dominated strategies entails both noncentrist types choosing  $\{-1, 1\}$ . In the case of BL, in contrast, it is not clear that a voter should vote for the ambiguous platform  $A = \{-1, 1\}$  instead of  $A = \{0\}$ . There exists, for example, an equilibrium where leftist candidates choose  $\{-1\}$ , centrists choose  $\{0\}$ , and rightists choose the ambiguous platform  $\{-1, 1\}$ . In this equilibrium, rational leftist voters vote for platform  $\{0\}$  over  $\{-1, 1\}$ .

The model is robust to slightly different assumptions. In the Appendix, we discuss the robustness with respect to relaxing the model in three natural dimensions. Specifically, the equilibria identified here persist with minor changes to the parameter restrictions if centrists prefer one of the noncentrists over the other, if we allow for the whole power set as a possible set of platforms or if candidates are slightly office motivated.

## Hypotheses

Our hypotheses are derived from the results of our theoretical analysis. However, these results relied on rationality assumptions that are unlikely to hold in reality. In our empirical analysis, we will exploit certain deviations from the full-rationality benchmark to infer which of these assumptions are critical for ambiguous platforms to be played in equilibrium. In particular, we will focus on the following assumptions regarding the strategic and cognitive abilities of players.

**Assumption 1.** *Candidates and voters understand the concept of statistical correlation.*

**Assumption 2.** *Candidates and voters are sophisticated in their strategic behavior.*

<sup>10</sup> Truthful commitment fails to be an equilibrium for high levels of  $u_0$ . See Appendix for details.

The first assumption pertains to the model's main innovation, which requires players to understand the correlation of preferences in the society.<sup>11</sup> The second, strategically sophisticated reasoning (in the sense of best-responding to expected equilibrium behavior of other players) is required in any standard game-theoretic analysis. We explicitly include both assumptions because deviations from the benchmark of full rationality are well documented in the empirical literature; see Enke and Zimmermann (2019) or Rees-Jones, Shorrer, and Tergiman (2020) for correlation neglect and Nagel (1995) for limited strategic reasoning.

A primary insight from our model was that untested noncentrist candidates have a clearer path to electoral victory with ambiguous platforms when they are facing an established centrist compared with elections with an open field. Corollary 1 stated that the *only* way a noncentrist candidate can win against a known centrist (treatment KC) is by committing to the ambiguous platform. With two unknown candidates (treatment BL), in contrast, the strategy of playing ambiguous platforms is only one possible equilibrium and unambiguous noncentrist platforms can win elections if both candidates are noncentrists. As at least some of the voters and candidates in BL may expect an equilibrium with truthful platforms to be played, we conjecture ambiguous platforms to be at most as prevalent and popular in BL compared with KC. In summary,

**Hypothesis 1.** *The probability of a noncentrist candidate choosing an ambiguous platform is*

- a) *weakly higher in treatment KC than in BL if Assumptions 1 and 2 are satisfied and*
- b) *higher for candidates who satisfy Assumption 1 and 2 in treatment KC than for those who do not.*

**Hypothesis 2.** *The probability of noncentrist voters voting for an ambiguous platform is*

- a) *weakly higher in treatment KC than in BL if Assumptions 1 and 2 are satisfied and*
- b) *higher for voters who satisfy Assumption 1 and 2 in treatment KC than for those who do not.*

The first part of each hypothesis is derived from equilibrium predictions of the model under the assumption of full rationality of all players. The second parts follow from the idea that in treatment KC, players who satisfy the rationality assumptions should be able to solve for the unique perfect undominated equilibrium. We cannot formulate a similar within-treatment hypothesis for BL, as the multiplicity of equilibria implies that unambiguous platforms are fully rationalizable for candidates and voters. Despite their intuitive appeal, the second parts of the hypotheses assume bounded

rationality of players and thus do not follow directly from the rational model. Essentially, these parts assume that boundedly rational behavior implies more randomness in subjects' choices. We provide in the Appendix a simple model extension that rationalizes the direction of behavior hypothesized in 1.b and 2.b., which is based on a behavioral assumption regarding the perceived correlation of preferences.

## EXPERIMENTAL DESIGN

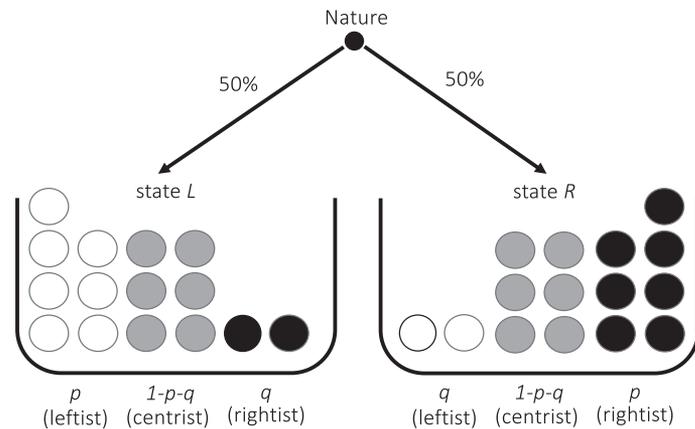
Our experimental setup closely mimics the above theoretical voting model. In addition to the voting game, we implemented a number of tasks to explain individual-level variation in the attractiveness of ambiguous platforms. The details of the experimental parametrization of the model and the additional incentivized tasks performed by participants are as follows.

*Preferences and information.* A round in our experimental voting game consists of two candidates and  $N = 15$  voters. At the beginning of each game, the state of the world  $\omega \in \{L, R\}$ , which determines the distribution of preferences over outcomes in the society, is drawn by nature randomly and with equal probability. In the experiment, the two possible states of the world are represented by urns containing a different number of colored balls as shown in Figure 1. Specifically, the urn for state  $L$  contains  $p = 7$  white balls,  $q = 2$  black balls, and  $15 - p - q = 6$  gray balls. The number of black and white balls ( $p$  and  $q$ ) is reversed in the urn for state  $R$ . The color of a ball represents a subject's preference type  $\tau \in \{-1, 0, 1\}$  introduced in the theoretical model: *white* represents preferences of type  $\tau = -1$  (leftist), *gray* stands for  $\tau = 0$  (centrist), and *black* for  $\tau = 1$  (rightist) preferences. Conditional on the realized state of the world, preferences are assigned to subjects (candidates and voters) randomly from the same urn (see Figure 1). Specifically, the two candidates' balls are drawn *with* replacement, and then all 15 balls are distributed to voters *without* replacement. Drawing voter types without replacement implies that there will only be two possible realizations of voter-type distributions. This is intended to mirror the situation in large elections where the law of large numbers implies that, conditional on the state of the world in our model, the variance in type shares between separate random draws is negligible. It also implies that the relevant uncertainty players face pertains to these fundamentals. The urn composition and the probability with which each urn is randomly selected is common knowledge, but the selected urn is unknown to all players. A subject's own preference type (color of ball) is private information.

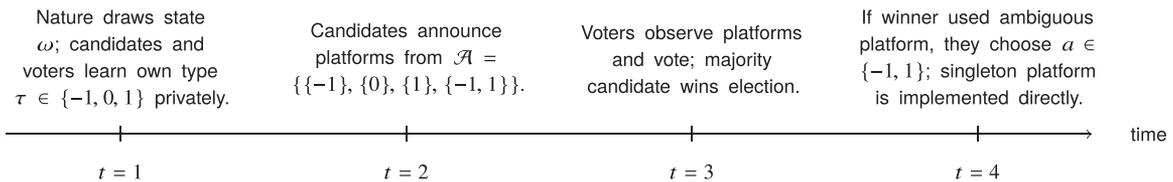
It is important to emphasize that we used colored balls to ensure a neutral framing for preferences, choices, and outcomes. Compared with field surveys, our experimental design increases the chance of isolating an important mechanism behind the attractiveness of ambiguous platforms because our setup is free from framing issues, ideological positions, or political partisanship that arise naturally in the field. The verbal and

<sup>11</sup> Note that the model also assumes correct higher-order beliefs. In particular, it is necessary for candidates to believe that enough voters understand the correlation and are strategically sophisticated and *vice versa*.

**FIGURE 1. State of World and Implied Preference Distribution**



**FIGURE 2. Timing of the Baseline Voting Game**



graphical instructions as well as screenshots of the decision interface are found in the Appendix. Regardless of our neutral framing, we will mostly relabel preference types here using the left–right spectrum for ease of exposition.

*Choices and outcomes.* The timing of decisions and information is depicted in Figure 2. After preference types have been assigned, each candidate simultaneously chooses one of the four possible platforms: commit to a singleton platform  $A \in \{\{white\}, \{gray\}, \{black\}\}$  or run with an ambiguous platform  $A = \{white, black\}$ . Voters then vote simultaneously using the strategy method.<sup>12</sup> After all votes had been made, the winning candidate was determined by simple majority. If the winning candidate proposed a singleton platform, the policy was implemented directly; in the case that a candidate won with an ambiguous platform, she would then choose which of the noncentrist policies contained in the ambiguous

platform (white or black) to implement. Payoffs for each subject would then be determined and the game ended.

Monetary payoffs attached to outcomes were decreasing in the distance to the subject’s own policy preferences. If a noncentrist policy was implemented, subjects of the same noncentrist preferences type received payoff  $\pi_H$ , those with the opposite noncentrist preferences received  $\pi_L$ , and centrists received  $\pi_M$ . We used the following values for point payoffs:  $\pi_H = 15 > \pi_M = 8 > \pi_L = 5$ .<sup>13</sup> If the centrist policy (gray) was implemented, centrists received  $\pi_H$  and those with noncentrist preferences received  $\pi_M$ . Payoffs were the same for candidates and voters and depended only on the policy implemented by the winning candidate and the subject’s own preference type, not on their identity.

*Treatments.* We designed two between-subject treatments to address the behavioral differences related to ambiguous platforms and electoral competition predicted by Hypothesis 1.a and 2.a. Treatment BL entails

<sup>12</sup> Voter choices are made using the strategy method, stating which candidate they would vote for if faced with different combinations of platforms. To minimize the number of contingent choices each voter has to make, when candidates proposed the same platform, voters did not make a decision and instead a candidate was chosen at random as the winner. This left voters with six contingent choices, as shown in the screenshots (see Appendix). The order of platforms was randomized to account for any possible bias of voters toward always selecting the first, or second, platform in case voters were indifferent between proposed options.

<sup>13</sup> A risk-neutral, noncentrist voter would be indifferent between  $\{-1, 1\}$  and  $\{0\}$ , if and only if  $\pi_M = \frac{p^2+q^2}{(p+q)^2} \times 15 + \left(1 - \frac{p^2+q^2}{(p+q)^2}\right) \times 5 \approx 11.5$ . Because most experimental subjects tend to be risk averse, we chose  $\pi_M = 8$  to counter the possible effects of voter risk aversion. Nevertheless, the level of  $\pi_M$  is irrelevant for our analysis as long as it encourages some amount of voting for ambiguous platforms because our main results are all based on between-treatment and within-treatment differences, not on absolute levels.

competition between two candidates of unknown type. A candidate can be any of the three preferences types,  $\tau \in \{-1, 0, 1\}$  and can choose either any of the singleton platforms or the ambiguous platform in the election as described in the model above. Treatment KC was identical to the BL with one exception: it was common knowledge that one of the candidates would always be a centrist,  $\tau = 0$ , who plays the centrist platform  $A = \{0\}$  truthfully. Taken together, the only difference between the two treatments is that the type and action set is restricted to the centrist position for one of the candidates in treatment KC.<sup>14</sup>

*Measuring correlation awareness and strategic sophistication.* After the voting game, subjects participated in additional tasks that were designed to test the validity of the theoretically posited mechanism behind ambiguous platforms for both candidates and voters (cf. Hypothesis 1.b and 2.b). From these tasks, we derive a participant's degree of correlation awareness and her level of strategic reasoning. We use two simple urn tasks to measure correlation awareness. Both involved a pair of urns, one with 9 green balls and 1 purple ball, the other with 1 green ball and 9 purple balls. In each task, one of the urns was randomly selected, each with equal probability, and a ball drawn then replaced with the color of the drawn ball, which was revealed to the subject. The subject had to then guess how many of 20 additional balls, drawn with replacement, were the same color as the initially drawn ball. In the first task (*Q1*), the urn was randomly selected before each draw, whereas in the second task (*Q2*) all balls were drawn from the same urn as the initial ball. The tasks measure whether a subject understands the concept of independence (*Q1*) and positive statistical correlation (*Q2*) between random variables. For each task, subjects were paid €2 if their guess was correct; the expected-payoff maximizing answers are 10 in *Q1* and 17 in *Q2*.

We measure subjects' strategic reasoning using the standard beauty contest game (Nagel 1995), where subjects had to choose an integer between 0 and 100 and the person who guessed closest to  $2/3$  of the average guess in the session won €10. The game can be solved by iterative deletion of strictly dominated strategies and has only 1 and 0 as its equilibrium guesses. However, these guesses rarely win if parts of the population are expected to guess something else and ability to reason strategically about other players' behavior and reasoning becomes critical. For example, if a person expects everyone else to make a random guess, the best response of the player would be to guess 33. In level-*k* models of strategic reasoning, such a player is commonly known as a level 1 player. Players best responding to a population of level-1 players ( $2/3 \times$

$33 = 22$ ) are level-2 players and so forth (cf. Nagel 1995).

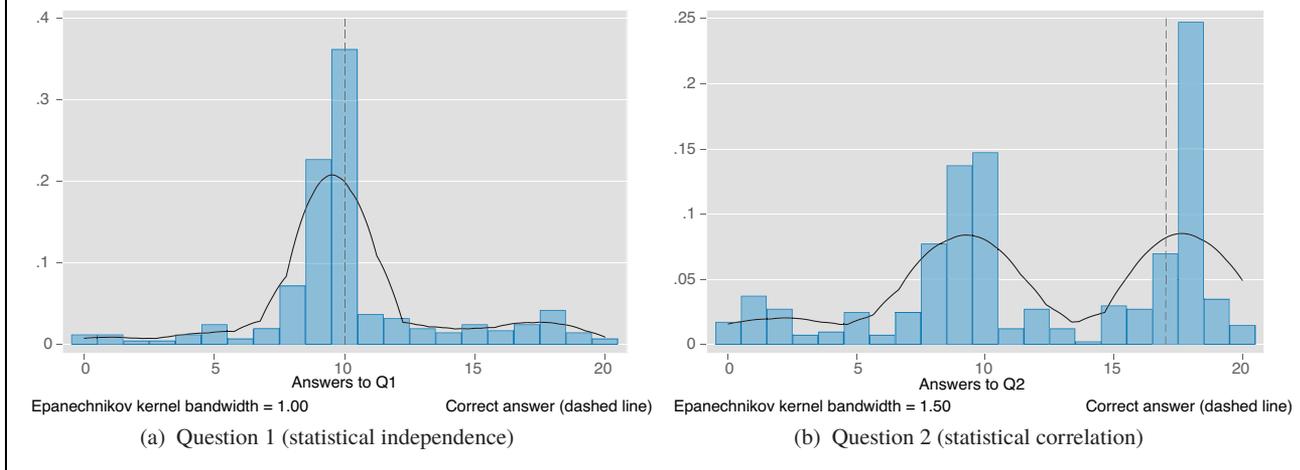
*Procedures.* A total of 400 subjects participated in the experiments at the experimental economics laboratory of the Vienna Center for Experimental Economics (University of Vienna). We ran eight sessions for each of the two treatments (BL and KC), comprising 160 candidates and 240 voters. The experiment was fully computerized and programmed in z-tree (Fischbacher 2007). Before the experiment commenced, subjects were given written instructions and completed a set of comprehension questions that they had to answer correctly before continuing. Each session consisted of 25 participants of which 10 were assigned randomly to the role of candidate and the remaining 15 were assigned the role of voter; roles remained fixed for the duration of the experiment. Depending on the randomly assigned treatment, subjects played 20 rounds of either the BL or KC treatment of the voting game. A candidate and the voters in the KC treatment were informed that the other candidate would be playing the centrist platform. In each round, the outcome for each of the five candidate pairs was based on the election decisions of all 15 voters. This was possible because voters reported their full strategies and these reports could thus be used to determine the winner of each of the five candidate pairs. The candidate pairs were randomly rematched after each round. At the end of each round, all subjects received feedback about which urn was selected, the color of each of the candidates' balls, and the payoffs of every player type in the game. Given that voter choices were used for five games within a round, voters received feedback from a single, randomly chosen game. The additional (incentivized) tasks as well as a short ex post questionnaire eliciting socioeconomic characteristics and self-reported risk preferences took place after the voting games.

The amount of money earned in the game and the additional tasks was revealed to each subject after all parts had been completed. To ensure incentive compatibility, all games had an equal probability of being selected for payment and all subjects involved in the game that was selected for payment were paid. This meant that candidates were paid based on a single game, whereas voters were paid for five games. To roughly equalize payments across the two player roles, the exchange rate from point earnings to euros was 1 point = €1 for candidates and 1 point = €0.2 for voters. Sessions lasted about 1.5 hours and participants earned an average of €20, ranging between €10 and €37.

## RESULTS

We first describe our subject pool both in terms of their responses to the postexperimental questionnaire as well as their choices in the additional experimental tasks that feature prominently in the subsequent analysis. We focus especially on the understanding of statistical correlation and the ability to think strategically because both are critical requirements for

<sup>14</sup> This means that voters in KC had only to make four contingent choices as opposed to six contingent choices in BL, see screenshots in the Appendix. To maximize the number of observations from candidates while not sacrificing any generality, all candidates chose between the four possible policies and half were assigned the role of a known centrist when rounds were selected for payment.

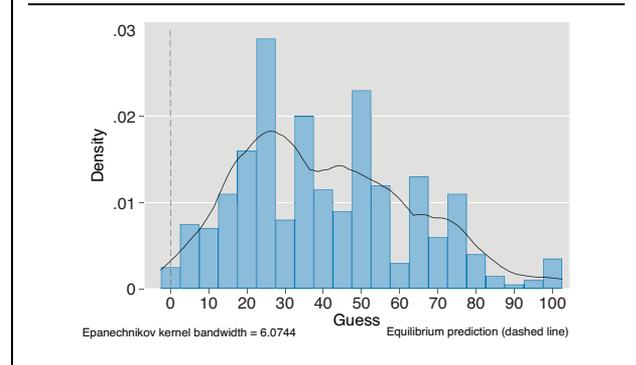
**FIGURE 3. Answers to Statistical Correlation Tasks**


ambiguous platforms in the fully rational model. We then go on to analyze candidate and voter behavior in the voting game. As our primary focus concerns the conditions under which ambiguous platforms are chosen and supported, we relegate how individual behavior is mapped into election outcomes to the Appendix.

### Population Characteristics

The results of the correlation task, which consisted of two questions, are shown in Figure 3. The answers to *Q1*, testing statistical independence, clustered around the payoff-maximizing answer of 10. The distribution of answers to *Q2*, which tests subjects' understanding of positive correlation, is clearly bimodal: although a large number of subjects update their beliefs fairly accurately, a similar number fail to update their prior at all. The size and shape of this bimodality is strikingly similar to the one found by Enke and Zimmermann (2019; see their Figure 2). For our statistical analysis below, we define a participant as *correlation aware* if the answer to each of the two questions is at most one integer from the correct answer and correlation unaware otherwise.<sup>15</sup> About 25% of the participants fit this definition.

The average guess in the beauty contest was 40.83 (SD 22.37), and the histogram of guesses of participants in Figure 4 illustrates the heterogeneity in levels of strategic reasoning. We define a participant as *strategically sophisticated* if she made a guess of 33 or less, which corresponds to being level 1 or higher. According to this definition, about 45% of subjects are strategically

**FIGURE 4. Distribution of Strategic Reasoning in Guessing Game**


sophisticated. Among them, the mean guess was 20.71 (SD 8.39). Average guesses and the distribution of strategic reasoning in our sample are in line with those found in the literature (e.g., Agranov, Caplin, and Tergiman 2015; Agranov et al. 2012).

Tables 1 and 2 present the proportion of correlation-aware and strategically sophisticated participants as well as further summary statistics separately for candidates and voters. The first two columns break down the subject pool by their treatment status, and the last column shows the results for the pooled sample. Overall, the average age was 25 years, approximately half the subjects were female, and the average self-reported willingness to take risks is 5.46 (SD 2.47) on a Likert-type scale from 0 (*not at all*) to 10 (*very much*). Wilcoxon rank sum tests find no statistical evidence that the groups are unbalanced with respect to any of these variables for either candidates or voters, which suggests that our random treatment assignment worked as intended.

### The Voting Game

We now present our main results on candidates' and voters' electoral behavior. We begin with candidates'

<sup>15</sup> We give leeway in the answers to allow for small errors that are unrelated to understanding of correlations, such as the possibility that some subjects may have overlooked the fact their ball was replaced or miscalculation of the payoff maximizing choice. We use responses in both questions rather than just *Q2* to minimize false positives: using our definition, a random-guesser is only misidentified as *correlation aware* with probability 0.0225 rather than 0.15.

**TABLE 1. Summary Statistics for Candidates**

	Treatment BL		Treatment KC		Pooled	
	Mean	SD	Mean	SD	Mean	SD
Age	25.04	6.65	25.04	6.32	25.04	6.47
Female	0.53	0.50	0.50	0.50	0.51	0.50
Correlation awareness	0.28	0.45	0.30	0.46	0.29	0.45
Strategic reasoning	0.43	0.50	0.45	0.50	0.44	0.50
Risk	5.76	2.39	5.55	2.49	5.66	2.43
Participants	80		80		160	

**TABLE 2. Summary Statistics for Voters**

	Treatment BL		Treatment KC		Pooled	
	Mean	SD	Mean	SD	Mean	SD
Age	24.95	6.25	25.06	5.89	25.00	6.06
Female	0.51	0.50	0.57	0.50	0.54	0.50
Correlation awareness	0.20	0.40	0.26	0.44	0.23	0.42
Strategic reasoning	0.47	0.50	0.43	0.50	0.45	0.50
Risk	5.37	2.67	5.29	2.32	5.33	2.49
Participants	120		120		240	

platform choice and its dependence on statistical and strategic sophistication. We then investigate which type of voter was more likely to vote for ambiguous platforms.

Note that the default unit of observation for candidates and voters is a choice in the game unless mentioned otherwise. We use two-sided tests unless specified otherwise. Only hypotheses regarding the main treatment effects (when subjects are sophisticated) and the effect of player sophistication in treatment KC (see Hypothesis 1 and 2) are directional, so one-sided tests are used. For between-treatment tests, we use Wilcoxon rank sum tests (WRS) and within-treatment tests use Wilcoxon signed rank tests (WSR). To ensure independence, the unit of observation in all nonparametric tests is based on the session level ( $n = 8$  independent observations per treatment). We further pool the data from both candidates and voters of opposite noncentrist preferences because the particular noncentrist type—that is,  $-1$  (or white) and  $1$  (or black)—is pure labeling and irrelevant for testing the model’s predictions regarding the use of ambiguous strategies. Moreover, choice proportions between playing the centrist and their own noncentrist platform do not differ for these two groups of candidates; see the Appendix for details regarding behavior using unpooled data.

*Candidate behavior*

Table 3 gives an overview of the proportion of candidates running on each of the available platforms. First, observe that most candidates seemed to understand the

basic incentives in the game and only a handful of either centrists or noncentrists played weakly dominated platforms. Centrist candidates propose their own preferred platform in both treatments and infer correctly that it does not pay to deviate from the truthful singleton platform to a noncentrist singleton platform,  $\{-1\}$  or  $\{1\}$ , or to run on the ambiguous platform,  $\{-1,1\}$ . On average, centrists choose their preferred platform in more than 90% of the games, whereas noncentrist types run on their preferred singleton platform only about 60% of the time. A difference of similar magnitude exists between centrist and noncentrist types in choosing the ambiguous platform. For noncentrist types, nearly 30% of platforms are ambiguous, whereas centrists almost never play ambiguous platforms, as predicted by theory. In other words, this simple framework is able to persuade a substantial number of noncentrist candidates to run on ambiguous platforms. If different types of voters in real elections perceive themselves similar to a given candidate, we expect an experienced politician who is otherwise likely to lose the election to employ an ambiguous strategy even more than the inexperienced subjects in our impersonal and abstract experiment.

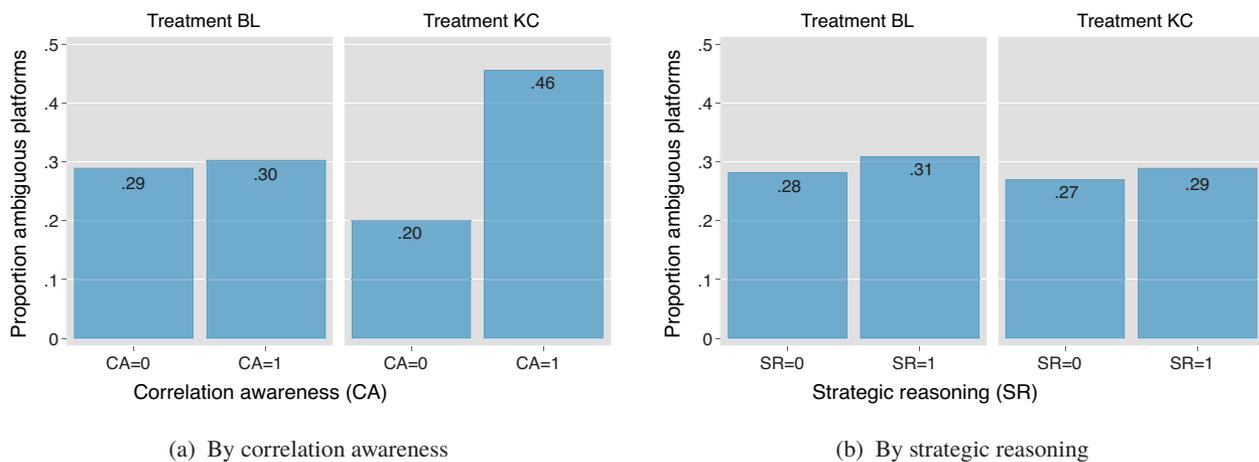
Turning to treatment differences, the raw choice data in Table 3 shows that 29% of noncentrist candidates run on ambiguous platforms in the BL compared with 28% in the KC. The difference in playing ambiguous platforms is not statistically significant across treatments (one-sided WRS,  $p = 0.601$ ). What is the reason for the insignificant treatment difference? Recall that the results in the main text show that a large share of subjects failed to satisfy the sophistication assumptions

**TABLE 3. Proportion of Platforms Played**

Platform choice	Centrist type		Noncentrist type	
	BL	KC	BL	KC
Centrist	0.93	0.96	0.09	0.15
Noncentrist (own)	0.04	0.03	0.61	0.55
Noncentrist (other)			0.01	0.02
Ambiguous	0.03	0.01	0.29	0.28
N	608	679	992	921

Note: Proportion of candidates of given preference type choosing given platform in each treatment. For centrists, choices of noncentrist platforms {-1} and {1} are pooled; for numbers by type see the Appendix. Unit of observation is an individual choice in the game.

**FIGURE 5. Playing Ambiguous Platforms by Sophistication**



in Hypothesis 1 either because they are neglecting correlations or do not reason strategically. To investigate the role these limitations play for explaining the nonexistent treatment difference, we run the same nonparametric tests conditional on our simple binary sophistication measures.

Figure 5a illustrates the proportion of ambiguous platforms played by noncentrists conditional on being correlation aware or correlation unaware for each treatment. For correlation-aware noncentrist candidates, we find that about 30% of them chose an ambiguous platform in BL compared with 46% in the KC treatment. In line with Hypothesis 1.a, this difference is statistically significant on the session level according to a Wilcoxon rank sum test (one-sided WRS,  $p = 0.050$ ). In support of Hypothesis 1.b, which is based on a within-treatment comparison, 46% of correlation-aware candidates run on an ambiguous platform in treatment KC, whereas the number is only 20% for correlation-neglecting candidates (one-sided WSR,  $p = 0.027$ ). Furthermore, the proportion of ambiguous platforms played by correlation-aware and unaware noncentrist candidates is quite similar in the BL treatment (30% vs. 29%; WSR,  $p = 0.641$ ). Overall, results reflect nicely the theoretically stronger incentives for

noncentrist types to play an ambiguous platform when running against a known centrist, conditional on them understanding these incentives. The clear increase in the proportion of ambiguous platforms played by correlation-aware candidates in treatment KC thus provides strong evidence for the internal validity of the theoretically posited mechanism behind running on ambiguous platforms.

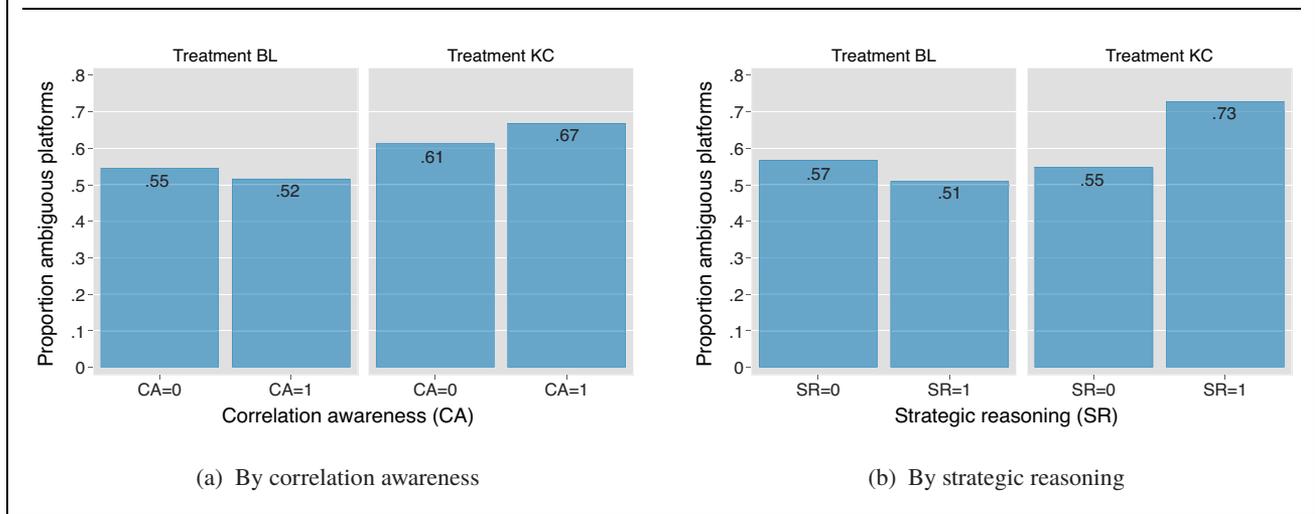
Figure 5b shows the between-treatment and within-treatment effects conditional on subjects' ability to reason strategically. It is clear from the figure that there are no significant differences between relevant groups of comparison. Specifically, 28% of nonstrategic reasoners in the BL treatment chose an ambiguous platform versus 27% in the KC treatment (WRS,  $p = 0.721$ ), whereas for the group of strategic reasoners these figures are 31% and 29% (one-sided WRS,  $p = 0.713$ ), respectively. Within-treatment differences between strategic reasoners and nonstrategic reasoners are also not significantly different from one another (WSR,  $p = 0.547$  in BL and one-sided WSR,  $p = 0.578$  in KC). Taken together, our results on candidate behavior show that correlation awareness is an important explanatory variable for running on ambiguous platforms but our measure of strategic reasoning is not. In

**TABLE 4. Proportion of Votes for Platform 2**

Platform 1	Platform 2	Centrist type		Noncentrist type	
		BL	KC	BL	KC
Center	Noncentrist (own)	0.04	0.03	0.88	0.88
Center	Noncentrist (other)			0.08	0.10
Center	Ambiguous	0.05	0.04	0.54	0.63
Noncentrist (other)	Noncentrist (own)	-	-	0.94	-
Noncentrist (other)	Ambiguous	0.61	-	0.92	-
Noncentrist (own)	Ambiguous			0.09	-
Total votes cast		960	960	1,440	1,440

Note: Proportion of voters of given preference type voting for platform 2 for each combination of platform competition and treatment. For centrists, choices of noncentrist platforms {−1} and {1} are pooled; for numbers by type see the Appendix. Unit of observation is an individual choice in the game.

**FIGURE 6. Voting for Ambiguous Platform by Sophistication**



short, an otherwise losing candidate is likely to run on an ambiguous platform only if they understand that they may appear similar to multiple groups of voters by doing so. These results are fully corroborated by probit regressions provided in the Appendix. In particular, the results are robust to controlling for the candidates' age, sex, and risk preferences, as well as including both strategic sophistication and correlation awareness simultaneously as explanatory variables. All regression results are robust to a variety of alternative definitions of strategic sophistication and correlation awareness.

*Voter behavior*

Turning to voter behavior, Table 4 summarizes the proportion of voters supporting platform 2 for each combination of candidate competition and treatment. We start with a number of results regarding voting choices for different scenarios of electoral competition by the two candidates showing that vote choices are largely consistent with expected utility maximization. We then investigate the treatment effects and the

cognitive requirements influencing support of ambiguous platforms as summarized in Hypothesis 2.a and 2.b.

First note that, similar to candidates, voters seldom give their vote to weakly dominated platforms, suggesting that voters understood the basic incentive structure of the game. A striking observation from Table 4 is the high overall support among noncentrist voters for ambiguous platforms: conditional on the other candidate proposing the centrist platform, 54–63% of voters with noncentrist preferences vote for the candidate proposing an ambiguous platform.<sup>16</sup> In other words,

<sup>16</sup> The difference in expected vote shares for a noncentrist candidate between committing truthfully and choosing the ambiguous platform is minimal. To see this, ignore the negligible and almost identical mistakes by centrists in the case when one of the candidates was a centrist and assume, as in treatment KC in Table 4, unambiguously proposing one's preferred platform yields support from 9 out of 10 of the voters who share the candidate's color and 1 out of 10 from the opposing noncentrists. Now, it is easy to verify that the correct Bayesian posterior for the candidate's noncentrist ball being the same color as the majority of noncentrists is 7 out of 9. This makes

almost two thirds of these voters in treatment KC and more than half in BL prefer ambiguous candidates to centrists. Regarding the main treatment effect stated in Hypothesis 2, we observe that 63% of noncentrist voters go for an ambiguous platform over a centrist one in the KC treatment compared with only 54% in BL. This raw difference between treatments is statistically significant (one-sided WRS,  $p = 0.015$ ). As anticipated by the theory, the reduced multiplicity of equilibria in treatment KC helps voters to form correct beliefs about the preferences of an ambiguous candidate. The experimental result matches the pattern from recent elections where a political outsider (2016 US presidential election) or an anti-status quo platform (Brexit referendum) has been successful against a well-known alternative.

Based on Hypothesis 2.b, we expect that much of the remaining variation in voters' responses to offered ambiguous platforms is explained by heterogeneity in correlation awareness and strategic reasoning. Starting with correlation awareness, we find that 67% of correlation-aware voters vote for ambiguous platforms in treatment KC compared with 52% in BL. The direction of the difference in voting is as hypothesized, and the magnitude substantial, but it is not statistically significant (one-sided WRS,  $p = 0.112$ ). As shown in Figure 6a, there is no large within-treatment difference in voting for ambiguous platforms between correlation-aware and correlation-neglecting noncentrist voters in treatment KC (one-sided WSR,  $p = 0.578$ ). In other words, correlation awareness is at best explaining only a small fraction of the treatment difference in the support for ambiguous platforms.

Figure 6b illustrates between and within-treatment differences in voting for ambiguous platforms conditional on the other candidate being a centrist and separated by the subject's level of strategic reasoning. The figure makes it clear that most of the overall treatment effect mentioned above is due to differences in the behavior of strategically sophisticated individuals. In support of our hypothesis, strategically sophisticated subjects vote for ambiguous candidates in 51% of the games when both candidates have an ex ante unknown type, whereas the number increases substantially to 73% when one candidate is a known centrist (one-sided WRS,  $p = 0.003$ ). For individuals who performed poorly in the strategic reasoning task, the ratio hardly changes from 57% to 55%, respectively, when comparing treatments BL and KC (WRS,  $p = 0.721$ ).

Regarding within-treatment differences, strategic reasoners are also more likely to vote for an ambiguous candidates than nonstrategic reasoners in the KC treatment (one-sided WSR,  $p = 0.020$ ) but not so in treatment BL (WSR,  $p = 0.547$ ). Again, both effects are as expected theoretically. Overall, we find in line with the

theory that correlation-aware and strategically sophisticated voters increase their propensity of choosing an ambiguous candidate when moving from BL to KC, although only the influence of the latter is statistically significant. Similar to the candidate results, these patterns are supported by probit regressions that simultaneously control for the two individual-level sophistication measures (see Appendix for regressions). Furthermore, when strategic reasoning is controlled for, the treatment effect for correlation-aware individuals is close to zero. This suggests that it is indeed strategic sophistication that is important for voters and any apparent differences related to correlation awareness in Figure 6a are due to the correlation between these two variables. All regression results are robust to a variety of alternative definitions of strategic sophistication and correlation awareness (see Appendix for details).

### Explaining the Asymmetry

Our results show that correlated preferences or perceived similarity in the population can generate ambiguous political platforms as well as support for them. However, the prevalence and popularity of such platforms depends simultaneously on the presence or absence of a known centrist and subjects' understanding of correlations and degree of strategic sophistication. We also uncovered a surprising asymmetry between candidates and voters. Results revealed that correlation awareness, but not strategic reasoning, is related positively with candidates' likelihood of choosing ambiguous platforms when matched with a known centrist. For voters, on the other hand, strategic reasoning was highly associated with a treatment difference in their support for ambiguous platforms but correlation awareness was not.

Bearing in mind that we had not anticipated that the different player roles would interact differently with our two sophistication assumptions, we discuss here an extension to our model that provides an ex post explanation of this asymmetry. The model extension in the Appendix demonstrates the effect each possible combination of Assumption 1 and 2 (correlation un/awareness and non/strategic reasoning) has on the likelihood to use and support ambiguous policies for candidates and voters.

The model shows that, indeed, the level of strategic sophistication required from the voters to solve the game is higher than what is required from the candidates. However, it is hard to generate the observed asymmetry with the two dimensions of bounded rationality alone. Specifically, whenever voters are risk averse ( $u_0 < 0.5$ ) and not aware of the correlation, they have little reason to vote for the ambiguous platform no matter what their level of strategic reasoning is.

The model also illustrates that the asymmetry can be recovered by assuming that agents suffer from a sufficient level of false-consensus bias (e.g., Jensen 2009; Ross, Greene, and House 1977). In other words, if there is a bias that makes subjects overestimate the likelihood

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playing the ambiguous platform the best response to observed voter behavior, but only marginally. Consequently, the expected number of votes from committing to one's favorite color is  $\frac{7}{9}(\frac{9}{10} \times 7 + \frac{1}{10} \times 2) + \frac{2}{9}(\frac{9}{10} \times 2 + \frac{1}{10} \times 7) \approx 5.61$ . If one chooses the ambiguous platform, the expected number of votes in treatment KC is simply  $0.63 \times 9 = 5.67$ .

with which others have the same preference, even voters who do not understand the correlation structure may be induced to vote for an ambiguous candidate. Although our experiment was not designed to verify this mechanism, we think it is a promising candidate for understanding the observed asymmetry.

## CONCLUDING REMARKS

We have advanced and experimentally tested a novel explanation for the use and popularity of ambiguous platforms in electoral competitions. In particular, we have shown how a correlation between candidate and voter preferences can lead to ambiguous platforms and demonstrated that voters can be lured by these ambiguous messages into voting for a strategic candidate of even opposite policy preferences. This, in turn, can lead to negative consequences for the voter when such a candidate wins an election.

Our experimental results also indicate that a lack of awareness of the correlation of preferences in society and inability to reason strategically can shield voters to some extent from falling for ambiguous platforms.<sup>17</sup> Our results thus add to a recent debate on the relationship between voter rationality and political outcomes (see e.g., Ashworth and Bueno de Mesquita 2014; Ashworth, Bueno de Mesquita, and Friedenbergl 2018; Fowler and Hall 2018).

Nevertheless, we would like to caution against the naive conclusion that cognitive or behavioral biases would limit negative political consequences of ambiguity more generally. It is hard to know whether the observed level of strategic sophistication is likely to be higher or lower outside the laboratory. On the one hand, real-life voting takes place in a more familiar environment than our abstract setting and the strategies of real-life politicians may be more easily understood, potentially aided by media or discussion with friends and family. On the other hand, subjects in our experiment are faced with only a small number possible choices and have full information about their environment. However, having identified strategic sophistication as an important factor, we have provided a potential explanation for elections where an ambiguous challenger fails even when running against a known centrist.

Moreover, voter support for ambiguous platforms depends on *perceived* rather than actual correlation of preferences between voters and politicians. Understanding the correlation structure in our unframed experiment requires a degree of mathematical understanding that many of our subjects do not seem to possess. However, outside the lab there are forces that are likely to *strengthen* the perceived correlation for boundedly rational agents. Information bubbles in social networks

are a prominent example of situations in which voters may mistakenly perceive a high correlation of preferences with others in general and with candidates who communicate in the same echo chamber in particular. Furthermore, influencing voter perception using personalized campaigning can increase the perceived correlation of preferences in society, which would make ambiguous platforms even more successful than is suggested by our model. This is especially apparent with so-called dog whistles, where elements of a politician's messaging are understood differently by the general majority and a minority whom the politician is covertly targeting. Examples include hidden racist, sexist, or other antiminority messaging (see e.g., Haney-López 2015; Rossing 2017) and coded religious signaling (Albertson 2015). Simply the ability to send a coded message can be seen as a signal of preference similarity by the targeted minority, so dog whistles can create strong perceptions of correlated preferences between a candidate and diverse voter groups.<sup>18</sup>

In summary, we have introduced a theoretical model that clearly demonstrates how ambiguous platforms can be appealing to candidates and attractive to voters and yet have deleterious implications for election outcomes. Our laboratory experiments and discussion of the literature show how behavioral deviations from the assumptions of the model can diminish or augment these effects. Our research provides guidance for interpreting data on real-world elections, which can also be used in the future to test the external validity of our results.

## SUPPLEMENTARY MATERIALS

To view supplementary material for this article, please visit <https://doi.org/10.1017/S0003055421001155>.

## DATA AVAILABILITY STATEMENT

Replication files and data are openly available at the American Political Science Review Dataverse: <https://doi.org/10.7910/DVN/PSSLAC>.

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<sup>17</sup> Levy and Razin (2015a; 2015b) arrive at a similar conclusion in an election setting where updating errors due to correlation neglect on the part of voters can lead to socially beneficial information aggregation.

<sup>18</sup> For example, Haney-López (2015) argues that the GOP has successfully used racial dog whistles to unite extremely wealthy individuals and poor whites against the middle class, a pattern that echoes the predictions of our model.

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## CONFLICT OF INTEREST

The authors declare no ethical issues or conflicts of interest in this research.

## ETHICAL STANDARDS

The authors declare that the human subjects research in this article was reviewed and approved by the Vienna Center for Experimental Economics (VCEE) at the University of Vienna as part of the project application for the laboratory experiment. Certificates are provided in the supplementary materials. The authors affirm that this article adheres to the APSA's Principles and Guidance on Human Subject Research.

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