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Does Party Competition Affect Political Activism?

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Abstract

Does party competition affect political activism? This paper studies the decision of party supporters to join political campaigns. We present a framework that incorporates supporters' instrumental and expressive motives and illustrates that party competition can either increase or decrease party activism. To distinguish between these competing predictions, we implemented a field experiment with a European party during a national election. In a seemingly unrelated party survey, we randomly assigned 1,417 party supporters to true information that the canvassing activity of the main competitor party was exceptionally high. Using unobtrusive, real-time data on party supporters' canvassing behavior, we find that treated respondents are 30 percent less likely to go canvassing. To investigate the causal mechanism, we leverage additional survey evidence collected two months after the campaign. Consistent with affective accounts of political activism, we show that increased competition lowered party supporters' political self-efficacy, which plausibly led them to remain inactive.

Keywords: party activism, electoral competition, field experiment, campaigns.

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What explains why some citizens become politically active, while others remain inert? The active engagement of citizens in politics is a crucial precondition for a thriving democracy. Parties play a pivotal role in this process. They allow citizens to voice their preferences and to take political action. The number of party members, however, has seen substantial changes over the last two decades.[1] Party members have also become less active (Scarrow, 2017; Whiteley and Seyd, 2002; Whiteley, 2011). Meanwhile, the electoral landscape, too, has seen significant changes. In the United States, there is increasing variation in the competitiveness of local electoral races (Fraga and Hersh, 2018). In Europe, we observe a rise of new, often right-wing, parties, which has fundamentally altered the nature of party competition (Oesch and Rennwald, 2018).

Can changes in electoral competition help explain variation in political engagement? More precisely, is party activism a product of competition between parties? Scarrow (2017) notes that "upticks in [party] membership [are] often motivated by close electoral contests" (see also, Detterbeck 2005). And Chong (2014, 76) seconds that "political activists relish the competition and conflict of the political arena." Yet, empirical evidence for the link from competition to party activism is scarce. There is a longstanding literature on the effect of election closeness on turnout. But the findings are mixed. Focusing on the U.S., some studies provide evidence for a positive competition-turnout link in elections at the federal (Grofman et al., 1998; Pacheco, 2008) and state level (Flavin and Shufeldt, 2015), while others find no such evidence neither for actual nor perceived competition (Huckfeldt et al., 2007; Matsusaka, 1993). The lack of clear evidence has led some to argue that greater party competition does not directly affect voters, but that it leads parties to make

[1] In the UK, for instance, the conservative party has lost over 100.000 members since 2002, while labour gained nearly 300.000 members (Whiteley et al., 2019). In Germany, the same period saw all major parties—save the Green party—lose a significant share of their members (Niedermayer, 2019).

greater mobilization efforts (Cox and Munger, 1989).

Among the few studies that focus on political engagement beyond turnout, Settle et al. (2016) find that residents of U.S. battleground states are more likely to discuss politics on Facebook. And Lipsitz (2009) seconds that the same residents are also more likely to attend political events and to make political donations. The existing studies, however, are correlational and operate at aggregate levels which, as pointed out by Matsusaka and Palda (1993), may give rise to aggregation bias. Most problematic, we currently lack evidence whether electoral competition also affects party activism. The latter outcome, however, is arguably the most plausible margin along which we would expect party competition to have a meaningful effect (cp. Cox and Munger, 1989). Party activism is also a highly policy relevant outcome if we are to sustain lively political campaigns.

This paper revisits the link between party competition and political activism using a field experiment. To motivate our empirical analysis, we present a simple theoretical framework that conceptualizes how increased party competition may affect the benefits a party supporter derives from becoming politically active. First, we consider instrumental benefits. We posit that if the supporter's party is ahead in the polls, a rise in effort by the competitor sets in motion two forces: Greater competition makes a race tighter, which increases the likelihood that the supporter is pivotal and may thus spur participation (Gerber et al., 2008; Olson, 1965). Moreover, increased competition means voters are exposed to more campaigning, which can alter the supporter's effectiveness. Second, we consider expressive benefits. We argue that on one hand greater party competition can trigger anger towards the competitor (Huddy et al., 2007) and enthusiasm toward the supporter's own party (Marcus et al., 2000), which may foster activism. On the other hand, greater competition may provoke anxiety (Huddy et al., 2007) and curtail the supporter's self-efficacy (Campbell et al., 1954; Finkel, 1985), which may prevent the supporter from becoming active.

To empirically test whether party competition increases or decreases party activism, we draw on a unique empirical setting and data source. In cooperation with a major Western European party,[2] we implemented a field experiment during a recent national electoral campaign. Before the launch of the campaign, we distributed a survey to the party's campaign email list, which was answered by 1,417 activists. In the survey, we randomized whether respondents were given true information about the planned canvassing of members of the main competitor party. The information indicated that the effort of the competitor was exceptionally high. Given that the party we cooperated with was leading in the polls, the treatment therefore rendered the upcoming election more competitive. The control group received no information, leaving perceptions about competition unchanged.

Our main outcome is unobtrusive, real-time data on respondents' canvassing behavior in the campaign, which we obtained through a novel canvassing smartphone application distributed by the party. Comparing treatment to control respondents, we find that the information made supporters significantly *less* likely to go canvassing. Put differently, framing the election as more competitive decreased supporters' willingness to participate in the campaign. Treated individuals were 4.6 percentage points less likely to knock on doors during the campaign, compared to a control group mean of 16.7 percent. This corresponds to a 30 percent reduction in the likelihood of becoming active.

At what point during the campaign did the drop in participation materialize? The disaggregated temporal canvassing data shows that the effect built up continuously. It emerged a few weeks after the treatment was administered and became steadily larger as the campaign progressed. Indeed, the engagement gap between the treatment and control group was largest in the final weeks of the campaign. This temporal pattern underscores that the observed treatment effect is not simply a short-lived empirical fluke. Rather, the manipulation meaningfully shifted

[2]We agreed to anonymize the name of the party and the country of study.

behavior throughout the electoral campaign.

To corroborate that the treatment effect is driven by changes in supporters' beliefs about the competitor's effort, we present three pieces of evidence. First, the survey elicited respondents' beliefs about the canvassing behavior of the competitor party before and after the treatment was shown. This allows us to demonstrate that the treatment, indeed, caused respondents to update their beliefs. Second, we show that respondents who underestimate the competitor's effort—i.e., those who learn that the competitor is more active than previously thought—contribute more to the observed treatment effects than overestimators. Third, we document correlationally that control group respondents' beliefs about the effort of the competitor party are *negatively* associated with their own engagement in the campaign. Put differently, supporters who expect the competitor to do more, canvass less.

Why did the competition treatment lead supporters to remain inactive? To parse out the underlying mechanism, we explore whether the drop in participation was due to the fact that increased party competition reduced supporters' perceived effectiveness. Two months after the election, we therefore implemented a follow-up survey, which was taken up by 196 party supporters. Based on this data, we confirm that treated respondents exhibited significantly less confidence that their political engagement will make a difference. The treatment effect is a sizable 0.27 standard deviations and as high as 0.34 standard deviations when restricting the sample to respondents who underestimated the competitor's effort level.

Besides contributing to an enduring debate about electoral competition and political engagement, our study adds to a growing literature studying the determinants of political activism in general and party activism in particular (Enos and Hersh, 2015; Hager et al., 2019; Han, 2016; Holbein, 2017; Seyd and Whiteley, 2004; Whiteley and Seyd, 2002, 1998). We add to this debate by, for the first time, providing micro-level causal evidence combining unobtrusive behavioral data with exogenous

variation in perceptions about party competition. Our findings demonstrate that the decision to join a campaign is decidedly affected by effort choices of political competitors: increasing perceived competition led party supporters to stay off the campaign trail. This contrasts with much of the existing, mostly correlational literature which finds either positive or zero effects on political activism (Huckfeldt et al., 2007; Lipsitz, 2009; Settle et al., 2016; Vowles et al., 2017). This contrast highlights the need for exogenous variation in (perceptions of) party competition to study its effects. Meanwhile, a theoretical channel that we empirically explore—party competition lowering supporters' perceived effectiveness—speaks to broader evidence that links self-efficacy to political participation (Karp and Banducci, 2008; Sloam, 2014; Vecchione and Caprara, 2009).

Theoretical framework

What explains why some party supporters join the campaign trail, while others remain inactive? This paper revisits one potential driver of campaign participation: party competition.[3] In the following, we provide a theoretical framework—incorporating instrumental and expressive benefits of political activism—that helps explain how party competition affects the decision to become active in a political campaign. The theory Appendix provides a formalization of our arguments.

[3] A related literature studies the demographics, ideology, and personality of party activist (Enos and Hersh, 2015; Hassell, 2019; Van Haute and Gauja, 2015). While this literature is important to understand who becomes a party activist, it does not directly speak to how external factors or strategic interactions influence political participation.

Instrumental considerations

We begin by considering an instrumental account of party activism in which a supporter[4] only cares about the outcome of an electoral race between two parties. The supporter may, for instance, want the party's ideology or policy goals to be implemented (Abramowitz and Saunders, 2006). In such an instrumental scenario, the supporter only joins the campaign if she decides the election, i.e., if she is pivotal. Since the likelihood of being pivotal is small and participation is costly (Enos and Hersh, 2015, 254), scholars typically expect low levels of activism based on instrumental grounds (Gerber et al., 2008; Olson, 1965). Importantly, however, the impact of volunteering in a political campaign is orders of magnitude larger than that of casting a ballot. A good canvasser convinces hundreds of people to vote. In our own sample, described below, party supporters knocked on an average of 224 doors and roughly 40 percent of local races for MP seats were close (within a 5 point margin). Party supporters' likelihood to be pivotal—real or perceived—was thus not trivial.

Suppose further then that the supporter's utility gained from the election depends on her own decision to participate in the campaign as well as that of members of the competitor party. Assume that the supporter's party has a higher ex ante likelihood of winning the election compared to the competitor party. This was the case in our empirical setting, where the party was polling ahead of its main competitor nationally as well as sub-nationally in most constituencies. Under this scenario, increased competitor effort affects the supporter's decision calculus in two ways:

On one hand, holding constant the number of persuaded voters, an increase in competitor effort increases the likelihood that the supporter is pivotal. If the competitor steps up its game, the margin between both parties shrinks. As a result,

[4]We use the term "supporter" to capture all individuals that lean towards a party and could plausibly join the campaign trail—be they members or not.

the supporter, if active, becomes more likely to decide the election by convincing voters to turn out for her party. Put differently, the marginal impact of every voter convinced on the likelihood of winning the election increases. Following the instrumental accounts developed by Downs et al. (1957) and Riker and Ordeshook (1968), the supporter should therefore become more likely to join the campaign when the competitor party increases its effort. A number of theoretical accounts therefore predict that as districts become more competitive, party activism rises (Beck and Heidemann, 2014; Godwin and Mitchell, 1982; Wolak, 2006). As Pattie and Johnston (2003, 310) write, "[w]here one's rivals campaign hard, there is an extra incentive to campaign harder oneself."

On the other hand, an increase in competitor effort implies that voters are more likely to be exposed to campaigning from the opposing camp (Grofman et al., 1998). Wolak (2006, 354), for instance, notes that competitive districts see greater "campaign intensity [which] increases opportunities for citizens to encounter campaign messages that captivate interest." A rise in effort by the competitor may thus make it harder for the supporter, if active, to persuade or mobilize voters for her own party. After all, a pitch at the door may be less persuasive if the competitor follows up shortly after. The supporter's goal is to persuade voters in favor of her party, for instance, by signaling that the party cares about the voter, by selectively emphasizing specific elements of the party's policy platform that are of interest to the voter, and by reducing the voter's overall uncertainty about the party's policy positions. All three mechanisms of persuasion may be weakened if the voter is visited by a competing party shortly before or after.[5] Increased party competition may therefore reduce an activist's effectiveness.[6] At the same time, it is also con-

[5]In a similar vein, Muller and Opp (1986) suggest that an individual's perception about the probability that her group will succeed reinforces her sense of personal efficacy, which determines her likelihood of participation.

[6]Whiteley and Seyd (1998) put forth an additional adverse instrumental channel: party supporters' participation in a campaign may be driven by the motive to hold elected office. If the

ceivable that activists feel *more* effective when party competition increases because they can counterbalance the effort of the competitor. Consequently, the effects of competition on perceived and actual effectiveness are theoretically ambiguous and ultimately an empirical question.[7]

In sum, in a purely instrumental framework, a rise in effort by the competitor affects a supporter's decision to join the campaign in two potentially counteracting ways. On one hand, increased party competition makes a race tighter, which means the supporter's participation is more likely to make a difference. On the other hand, increased party competition means voters are exposed to more campaigning, which might make a supporter's engagement more or less effective. Ex ante it is therefore unclear whether increased competitor effort increases or decreases party activism.

Expressive benefits

As emphasized by Huddy et al. (2015), a purely instrumental account of political activism is likely incomplete. When deciding whether to join a campaign, party supporters arguably also take into consideration a number of expressive benefits (Green et al., 2004). Marcus et al. (2000) and Huddy et al. (2007), for example, highlight that the contextual environment in which party supporters operate can trigger differential emotions and expressive benefits, which either increase or decrease their non-instrumental motivation to take political action. How precisely does increased party competition affect a supporter's emotions and expressive motives and how does it affect her decision to take political action?

On one hand, increased party competition may spark emotions that lead individuals to join the campaign trail. Three affective mechanisms are of particular relevance.

party is more likely to lose an election, this will decrease a supporter's personal career returns.

[7]In a formal model in the Online Appendix, we show that the sign of the effect of competitor effort hinges on the "production function" of canvassing.

First, increased competition poses a threat to party supporters' group status (Brown, 2000; Tajfel et al., 1979) and potentially triggers supporters' need to secure their party's status and electoral dominance (Huddy et al., 2013; Mason, 2015). A particularly important emotion in this context is anger. If a supporter feels that her group status is under threat, she may experience anger and decide to become active (Huddy et al., 2007).

Second and related, Glazer (2008) argues that political activism can be explained on the basis of a human desire to inflict losses on competitors. In the absence of party competition, a supporter may lack a suitable opponent and thus lack the motivation to become active. By contrast, increased competitor effort could spark a desire to see the competitor loose and thus inspire party supporters to take to the streets.

Third, political activists may simply enjoy the competitive nature of politics, where clearly identifiable groups fight for a specific goal. Greater party competition may thus spark a feeling of enthusiasm—an emotion that has been linked to higher political activism (Groenendyk and Banks, 2014; Marcus et al., 2000; Valentino et al., 2011). A similar argument is made by Chong (2014, 76) who writes: "political activists relish the competition and conflict of the political arena."

On the other hand, increased party competition can also spark emotions that lead individuals to abstain from the campaign trail. We describe three particularly important affective mechanisms.

First, increased party competition may infringe upon supporters' feeling of self-efficacy, which has been shown to drive political engagement (Campbell et al., 1954; Finkel, 1985; Klandermans and Stekelenburg, 2013). As conceptualized by Ryan and Deci (2000), self-efficacy can be curtailed when external pressures due to competition are present, leading to a suppression of expressive benefits (Deci et al., 1981; Reeve and Deci, 1996; Vallerand et al., 1986). As a consequence, suppressed

self-efficacy and expressive benefits in response to competition may ultimately inhibit activism. Evidence for this mechanism in the political domain is provided by Whiteley and Seyd (1998) who document that political group- and self-efficacy suffer among party members after a significant election loss.

Second, greater party competition may be interpreted as a threat to a supporter's group status and can thus provoke anxiety, which has been shown to curtail political engagement (Huddy et al., 2007). As Huddy and Mason (2008, 3) write, "threats (concerning for example a possible electoral defeat) could produce anxiety, leading to a desire to withdraw from political competition." In this regard, Settle et al. (2017) note that supporters with high levels of negative affectivity might be particularly likely to respond negatively to increased competition.

Third, potential activists may simply dislike the competitive nature of politics. Greater competition could thus lower enthusiasm towards the own campaign, which has been linked to political activism (Groenendyk and Banks, 2014; Marcus et al., 2000; Valentino et al., 2011). A related phenomenon are bandwagon effects (Marsh, 1985; McAllister and Studlar, 1991): party supporters may be more likely to participate in a party's campaign if they perceive the party to be more likely to win the election. Greater party competition implies a higher likelihood that the supporter's party loses the election, which may lead supporters to abstain from the campaign trail.[8]

In sum, the effect of increased party competition on supporters' expressive benefits will depend on the particular non-instrumental considerations and emotions triggered. As highlighted by Settle et al. (2017), there is likely substantial hetero-

[8]In an alternative reading, bandwagon effects may not be directed at the supported party's chances of winning but rather the total level of activism across all parties. In this case, if party competition and the total level of activism across the political spectrum are high, potential activists may be more likely to take political action, leading to a positive association between perceived competition and activists' canvassing effort.

geneity across individuals that may be determined by biological factors, personality, and their general inclination to participate in political activities (Arceneaux and Nickerson, 2009; MacKuen et al., 2010; Wolak and Marcus, 2007). Or, as Huddy et al. (2015, 10) put it: "Weakly identified fans may attend games when the team is doing well and skip those where defeat is likely, but strong fans hang on and participate, even when the team is sure to lose, in order to boost their team's chances of victory."

Design

Setting

To explore the impact of electoral competition on political activism, we implemented a field experiment in the context of a national election in a large Western European democracy. The country of study uses a mixed electoral system. Citizens cast two votes. The first vote is for the MP of the local electoral district who must receive the plurality of votes (each party can nominate one candidate). The second vote is for a party and is proportional.[9] Seats in the national parliament are given to all winning candidates in local electoral races. The remaining seats are allocated to preserve the proportionality of votes cast for the party (second vote).

We cooperated with one of the two main competing parties during the final weeks of the electoral campaigns. Parties in the country of study organize their activism at three levels. At the national-level, party headquarters are responsible for the overall campaign strategy and program, funding as well as providing logistical and organizational support to the grass-roots campaigns. The national headquar-

[9]More specifically, citizens vote for the party's list of candidates for the national parliament; the list is different in each federal state and decided upon by the local state's party caucus. Only parties that receive more than 5% of votes are taken into consideration.

ters also take care of most advertising (including, e.g., billboards, mailings as well as TV and radio ads). At the state-level, state party headquarters have similar responsibilities, but at a significantly smaller scale. At the local-level, party chapters are responsible for recruiting party members and supporters for the campaign. Importantly, this includes recruiting and organizing the canvassing teams.

The party we cooperated with promoted canvassing as a new effective campaign tool through internal communication channels as well as via the media.[10] Volunteers were instructed to systematically record canvassed doors using a novel smartphone application. All of the country's well over 200 constituencies saw canvassing activity, underlining the high level of engagement. During the campaign, the party headquarter stayed in touch with local canvassers via email, social media and telephone. One unit of the party was specifically tasked with training, supporting and motivating local canvassers.

Survey and Sample

In collaboration with the party's canvassing unit, we designed an online survey intended to collect information on current canvassing activity and potential roadblocks. The email was then sent out on behalf of the party to its list of supporters who had expressed interest in supporting the party during the electoral campaign, i.a., by registering on a widely publicized website. In the email, the supporters were asked to participate in the survey and informed that the answers would be used to help organize the party's canvassing activities. The invitation email was designed by the party and used a standard party template. A reminder email was sent one week after the initial invitation. Overall, 1,417 party supporters agreed to participate. The response rate was 5.6% among all sent emails, and 16.2% among

[10] Although door-to-door canvassing has been a widely used campaign strategy in many countries, it had been used scarcely in the country of study and by the party we cooperated with.

all opened emails. Importantly, participants were not aware that the data would also be used for scientific purposes.[11]

The survey was brief in nature so as to minimize dropout, including just ten questions. The survey instrument is provided in the Appendix. The first six items measured background information. As summarized in Table A1, we inquired about respondents' gender (23 percent female), age (mean of 40), party membership (mean of 82 percent), years of membership (mean of 12), prior canvassing experience (mean of 37 percent), and attendance at campaign workshops (mean of 22 percent). In addition, we know whether respondents had downloaded the canvassing smartphone application (discussed below) before the survey (28 percent).

How does the supporter sample compare to the party's full population of members? In order to maintain anonymity, we cannot provide precise figures. Broadly speaking, the sample matches the party's distribution of members regarding gender and geography. However, the sample is significantly younger than the average party member. Our sample is also disproportionally engaged. It includes 12.9% of all party supporters who canvassed for the party during the entire campaign. Furthermore, survey respondents were responsible for 21.9% of all knocked doors during the campaign. The sample can thus best be characterized as 'young and highly motivated supporters.' This group is relevant because it includes individuals for whom the party could have hoped to increase engagement. Given the mild nature of the intervention and the relatively high-effort nature of canvassing, this sample characteristic increases our ability to detect treatment effects. Moreover, the young age in our sample also implies that supporters did not face technological

[11]The party did not mention the scientific cooperation for two reasons. First, the email constituted regular contact with canvassers and thus resembled "business as usual." Second, the scientific cooperation with the party was subject to an agreement specifying that the data and setting would be kept confidential. We discuss the ethical considerations of our study in the Section on ethical considerations.

barriers to using the smartphone application with which the party organized its canvassing and which we used to obtain unobtrusive behavioral outcomes.

Still, we must caution that the behavior of our sample cannot be generalized to all party members. Our study merely allows us to draw internally valid conclusions about the strategic behavior of the party's active supporters who were interested in joining the campaign. This sample, however, is highly relevant. In our setting, the majority of canvassing (and campaigning at large) was done by a relatively small subset of motivated party supporters—individuals that took part in our survey.

Treatment

To study the effect of party competition on supporters' decision to participate in the campaign, we administered an information treatment to exogenously shift participants' beliefs about the canvassing effort of members of their main competitor party. Figure A.1 summarizes the experimental design, which consisted of three steps.

First, we elicited all respondents' pre-treatment beliefs about the canvassing intentions of the competitor party. Specifically, we asked:

> "*Think of 100 typical [competitor name] party members. What do you think: How many of these 100 [competitor name] party members plan to go canvassing in this electoral campaign?*"

On average, as Table A1 documents, respondents believed that 21 percent of members of the competitor party planned to go canvassing.

Second, we randomly assigned half of the participants to receive information about the canvassing intentions of members of their main competitor party. Respondents in the control group received no information.[12] Participants in the treatment

[12]Table A2 in the Online Appendix shows that randomization achieved excellent balance for the

group were shown the following treatment information that displayed the previously stated belief of the respondent and compared it to the true figure:[13]

> "*You said [X] out of 100 [competitor name] party members. According to a survey of [competitor name] party members, 56 out of 100 [competitor name] party members plan to go canvassing in this electoral campaign.*"

We gathered the information on canvassing intentions of the major competitor party in a different survey, which we had administered six weeks before the main experiment. This statistic was perceived as exceptionally high given that 89 percent of respondents underestimated this number (see Figure A.3). As the party we cooperated with was leading in the polls, the treatment information rendered the race more competitive than previously thought.

Third, we elicited all respondents' post-treatment beliefs about the actual canvassing effort of the competitor. This allows us to assess whether treated respondents updated their post-treatment beliefs. We inquired about "actual" behavior because we hypothesized that the actual behavior is ultimately the relevant metric that affects the electoral outcome. Specifically, we asked:

> "*What do you think: How many of these 100 [competitor name] party members will actually go canvassing during this electoral campaign?*"

After eliciting respondents' beliefs about canvassing intentions, providing the treatment and eliciting the post-treatment beliefs about actual behavior, we administered two attitudinal outcome measures. First, respondents were asked whether they planned to go canvassing in the campaign (mean of 53 percent; see Table A1). Second, respondents were asked how many days they planned to go canvassing (mean of 4.1; see Table A1).

aforementioned covariates across the treatment and control group. A joint F-test from a regression of the treatment indicator on all available pre-registered covariates is insignificant (p=0.471).

[13]The treatment screen also displayed the two numbers using a bar chart (depicted in Figure A.2). This served the purpose of making the two numbers more readily accessible and comparable

Outcome: Real-time canvassing behavior

To unobtrusively measure respondents' canvassing behavior, we draw on unique real-time data on actual canvassing activity collected by the party during the campaign. The party provided a novel smartphone application to its supporters to record knocked doors. Importantly, the party instructed and encouraged all canvassers to download and use the app. Frequent reminders via social media and email ensured that all active canvassers used the app. Local MPs were explicitly instructed to track all doors in the app. The party also provided the canvassers with training workshops in which party supporters were encouraged to use the app. To further boost take-up, the app included a number of gamification elements (e.g., titles for individuals that knocked many doors). Before the survey took place, 28 percent of the sample (400 supporters) had already downloaded the app. Another 80 supporters downloaded the app after the experiment. The unobtrusive, geo-coded app data provides a unique lens into the actual canvassing activities of respondents.[14]

The app data allows us to construct three behavioral outcomes: First, we construct a dummy for whether respondents engaged in any canvassing in the time from the survey until the election (average of 16 percent; see Table A1).[15] This measure captures respondents' *participation decision*, i.e., whether to canvass or not. By contrast, our second and third measure capture respondents' *effort decision* conditional on participating in the campaign. The second measure involves the number of days respondents went canvassing (average of 0.71 days; see Table A1). As our third outcome, we measure the total number of doors respondents knocked

[14]Reassuringly, the sample of canvassers is fairly homogenously spread out over the country of study. In our sample of survey respondents, we observe canvassing in 81.4% of all constituencies. Furthermore, canvassing activity is evenly spread across constituencies with no constituency containing more than 1.5% of our sample.

[15]Following our pre-analysis plan, individuals who do not appear in the canvassing application data are coded as 0. We show that all results are robust to a different coding scheme in the Robustness Section.

on winsorized at the 99th percentile (average of 34 doors; see Table A1).[16]

Results

Empirical specification

To assess the impact of the information treatment, we estimate the following pre-registered specification using ordinary least squares:[17]

$$\text{Canvassing}_i = \pi_0 + \pi_1 \text{Treatment}_i + \zeta^T \mathbf{X_i} + \varepsilon_i$$

where Canvassing_i is one of the measures of respondent i's party activism. Treatment_i is a dummy variable taking a value of one for people who receive the information and zero otherwise. $\mathbf{X_i}$ is the pre-registered set of control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in a campaign workshop, whether a participant has already downloaded the canvassing smartphone application, whether a participant has partic-

[16] One may be worried that the smartphone app affected respondents' canvassing behavior. We cannot, unfortunately, observe the behavior of respondents that did not download the app. Fortunately, the party strongly encouraged everyone to use the app. The behavior recorded in the app thus constitutes how a motivated, regular canvasser behaved. We should also reiterate that canvassers were not aware that researchers would look at the data. This arguably diminishes concerns about potential "observer effects" (see a more elaborate discussion in the Ethics section). Reassuringly, in Table A4 we show that control group respondents who used the app were 134% more likely to report an intention to go canvassing. Our sample thus likely captures the highly active canvassers. That said, we do not know if supporters' canvassing behavior would have been different had the party not used the app. Given that similar apps are used by many parties across Europe and the U.S., however, our evidence arguably captures regular canvassing behavior in today's political campaigns.

[17] Our results are robust to using logit regressions instead of ordinary least squares for binary outcomes. Results are shown in Table A6 in the Online Appendix.

ipated in canvassing before this national election and whether a participant has already canvassed during this election (see Table A1 for an overview). We report robust standard errors in all models.

Effect on canvassing behavior

Did the treatment affect respondents' canvassing behavior? We begin by analyzing respondents' participation decision. Columns 1 and 2 in Table 1 show that the treatment led to a significant *decrease* in respondents' party activism. In the combined sample—i.e., pooling under- and overestimators—we find that treated respondents are 4.6 percentage points less likely to participate in the campaign. This corresponds to a 30 percent decrease in the likelihood of becoming active. When including the pre-registered control variables, we estimate a reduction of 3.2 percentage points. Both estimates are highly significant: The randomization inference p-value demonstrates that, when considering all possible treatment assignments and assuming no effect for any individual, the probability of observing a reduction in engagement of this magnitude (by chance) is just 1 percent.[18] These findings indicate that the treatment had a significant negative effect on respondents' participation decision, i.e., whether to canvass or not.

Next, we investigate respondents' effort decision, i.e., how many days to canvass and how many doors to knock. Here, the coefficients are noisily measured. Three of the four reported coefficients imply that the treatment reduced respondents' effort decision. When excluding controls (Columns 3 and 5 in Table 1), for instance, treated individuals seemingly canvassed 0.12 fewer days (minus 16.4 percent) and

[18] As an additional robustness check, using the sample of participants who downloaded the canvassing application and for whom we know their location, Table A5 controls for local political circumstances by including a dummy variable that indicates whether the vote share difference between the party and its strongest competitor is within five percentage points. Results are virtually unchanged.

Table 1: Treatment effects on behavior

	Any canvassing		**Days canvassed**		**Doors knocked**	
	(1)	(2)	(3)	(4)	(5)	(6)
	Without Controls	*With Controls*	*Without Controls*	*With Controls*	*Without Controls*	*With Controls*
Treatment	-0.046**	-0.032**	-0.117	-0.044	-3.623	0.024
S.E.	(0.018)	(0.015)	(0.146)	(0.135)	(7.532)	(7.042)
RI p-value	[0.013]	[0.036]	[0.422]	[0.751]	[0.632]	[0.998]
Control mean	0.160	0.160	0.712	0.712	34.148	34.148
Observations	1,417	1,417	1,417	1,417	1,417	1,417
Controls	No	Yes	No	Yes	No	Yes

Notes: Table 1 presents coefficients, robust standard errors (in parentheses) and randomization inference based p-values (in brackets) of a linear model (OLS), regressing the indicated behavioral outcomes on the treatment. Outcome data are obtained through a smartphone application used by the canvassers to register knocked doors. "Any canvassing" refers to any recorded canvassing activity. "Days canvassed" refers to the number of canvassed days. "Doors knocked" refers to the number of knocked doors winsorized at the 99th percentile. Odd columns display specifications without control variables. Even columns include the following pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

knocked on 3.6 fewer doors (minus 10.6 percent). But, the estimates are not significant. In addition, when including control variables (Columns 4 and 6 in Table 1), the estimates are very close to zero and not consistently negative. Our evidence for respondents' effort decision is thus inconclusive and we cannot reject the null hypothesis.

Taken together, the pre-registered models yield robust evidence that learning about high activism in the competitor party had a negative effect on individuals' participation decision. We find no effect for individuals' effort decision. These effects suggest that 'marginal' activists who would have exerted relatively little canvassing

effort left the campaign.[19]

Dynamics of behavioral change

At what point and for how long did the treatment change respondents' engagement? One concern with experimental studies are short lived treatment effects. The real-time behavioral data at our disposal allows us to address this concern. In Figure 1 we plot the cumulative distribution of canvassing participation over the course of the campaign as well as one standard error intervals (black lines). The dotted line plots the treatment group, the solid line plots the control group. The treatment was administered in week zero (red line), while the election took place in week eight.

The Figure provides three pieces of evidence. First, treatment and control respondents are indistinguishable in the weeks preceding the experiment, underscoring that differences between the treatment and control group in the weeks following the experimental manipulation are caused by the treatment assignment. Second, there is a continuous buildup of engagement as the election day approaches. Third and most important, the treatment group—starting a few weeks after the randomized information provision—shows significantly lower levels of engagement. Furthermore, the gap between both groups widens at a roughly constant rate as the campaign progresses.[20] The continuous build-up of the effect thus underscores that the treatment had a pronounced and persistent effect on respondents' party activism.[21] The tem-

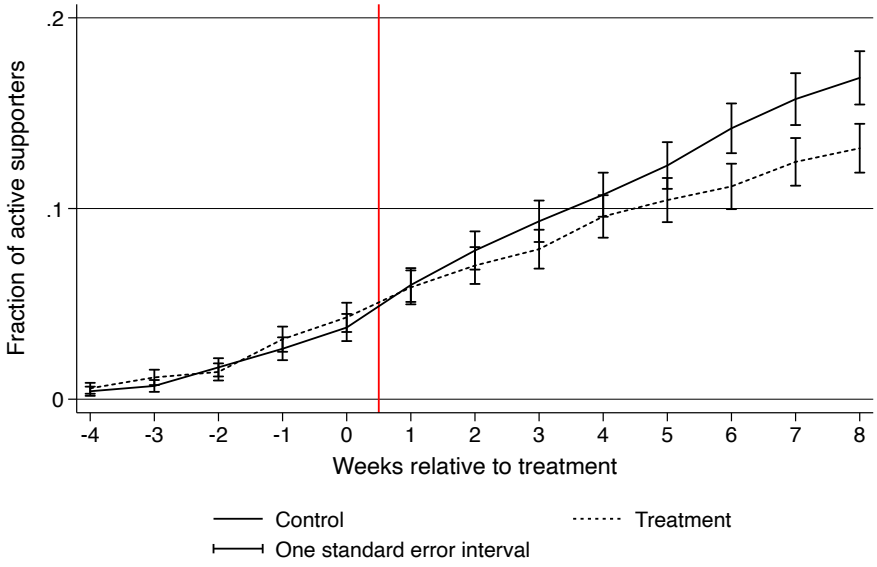
[19]For the sake of brevity, we report pre-registered heterogeneity analyses in the heterogeneity section of the Appendix.

[20]We attribute the lack of significant differences early on in the campaign to reduced power due to lower levels of canvassing activity.

[21]Two factors may contribute to the persistent and long-lasting effect of our information treatment. First, the information was provided through official party channels, which likely made the information salient and credible and thus produced a long-lasting impression on participants. Second, the information about canvassing intentions of the competitor party was 167% above what the average supporter believed. The impact of the treatment on respondents' beliefs was thus

poral pattern also holds when controlling time-invariant individual characteristics (see Figure A.5).

Figure 1: Participation in campaign over time



Notes: Figure 1 plots the raw fraction of respondents who participated in the canvassing campaign for any given week for the treatment group (dotted line) and the control group (solid line). The black vertical lines are one standard error intervals. The red vertical line indicates the timing of the treatment. The election took place in week eight. No control variables are included.

Robustness

Before turning to the mechanisms underlying the treatment effect, we provide two pieces of robustness regarding our outcome measure.

First, following our pre-analysis plan, we have coded respondents that did not use the app as not having canvassed.[22] If some of these respondents did canvass,

large, which helps explain its lasting effect.

[22]NB: we pre-registered and use the full survey sample—rather than the app user sample only—in order to avoid post-treatment bias, which would arise if the treatment had affected app downloads.

we classify them incorrectly and thus add measurement error to our outcome variable. This measurement error, however, is not problematic given that imputing zero canvassing for individuals without the application should attenuate the estimated treatment effect. The reported treatment effects thus represents a lower bound. Still, to further mitigate concerns regarding this imputation, Table A5 presents our main model excluding respondents that did not download the app or who did not register a valid location. Reassuringly, the results confirm our treatment effect which, if anything, becomes larger.

Second, one may be worried that the treatment affected uptake of the app differentially across the treatment and control group. Reassuringly, a large fraction of party supporters had already downloaded the app before the survey was fielded. This makes it unlikely that the treatment changed app download behavior. We confirm this conjecture in Table A3. Specifically, we find a zero-effect on individuals' likelihood to click on a link within the survey that took respondents to the App/ Android store to download the app. Furthermore, we also find no evidence on differential app download between the treatment and control group after the survey (neither for the 24h time window after the survey, one week after the survey, or any time after the survey).[23]

[23]As a further piece of robustness, we discuss the possibility of demand effects in the demand effects section of the appendix. Specifically, we investigate the effect of our treatment on two self-reported measures of respondents' intentions to go canvassing. We do *not* find a significant negative treatment effect on these self-reported outcomes. If anything, there is a slight positive effect (though the coefficient is insignificant without control variables). This short-term effect may be a product of social pressure induced by the surveyor as respondents might want to please the party by showing a higher willingness to engage in the campaign. The inconclusive finding thus, if anything, underscores the methodological necessity to collect unobtrusive behavioral data.

Mechanisms

Why did the competition treatment reduce party activism? In this section, we explore two mechanisms. First, we probe whether the treatment reduced party engagement by changing respondents' beliefs about the competitor party's effort. Second, we test for the potential mechanism that increased party competition reduces activism by rendering an activist's engagement less effective.

Beliefs about competitor effort

Did the treatment change respondents' behavior by changing their beliefs about the competitor party's effort? We provide three pieces of evidence in favor of this channel.

First, the treatment did indeed shift respondents' post-treatment beliefs about competing canvassers' behavior. Figure A.4 shows the difference between post- and pre-treatment beliefs across all participants in the control and treatment group. We observe that underestimators in the treatment group update positively relative to the control group underestimators. The reverse holds for overestimators (a formal test is provided in Table A7).

Second, as a qualification for beliefs as a causal channel we would expect underestimators to drive the treatment effects. Put differently, relative to overestimators, underestimators should canvass less as they learn about greater effort by the competitor. To test this empirically, in Table A8 we interact the treatment with a dummy for overestimation. Unfortunately, the sample includes very few overestimators (11 percent). We therefore lack the statistical power to reliably estimate differences between the two groups. With that said, Table A8 does show a positive interaction between the treatment and overestimation, suggesting that the results are driven by underestimators. However, due to the lack of statistical power, the

estimate should be interpreted with caution.

A third way to assess the importance of beliefs about competitor effort—though not causally identified—is to correlate control respondents' posterior belief about competitor effort with their canvassing behavior. Table A13 demonstrates that control respondents' beliefs correlate *negatively* with their canvassing behavior. Put simply, individuals expecting the competitor to do more, canvass less. The correlation is significant for all three behavioral measures. Moreover, the models are robust to the inclusion of the pre-registered control variables. The analysis thus lends further empirical support that beliefs are a plausible channel through which the treatment affected respondents' political activism.

Reduced perceived effectiveness

Did the treatment reduce respondents' activism by making canvassers feel less effective? To test this mechanism, we investigate whether the treatment, indeed, changed activists' perceptions about their effectiveness. To measure perceptions about campaign effectiveness, we conducted a follow-up survey with the same pool of party supporters two months after the election. We reached 196 respondents. While this number is low, there is no evidence that there was differential selection into the second survey: First, the original treatment status does not predict participation in the post-election survey (Tables A9 and A10). Second, the treatment and control group in the post-election survey are balanced on pre-determined covariates (Tables A11 and A12).

To measure whether treated respondents felt less effective, we asked to what extent they agreed with the following statement: "*You can change political circumstances by becoming politically active.*" Answers were scored on a seven-point Likert-scale from 'do not agree at all' to 'fully agree.' We standardize this variable to have a mean of zero and a standard deviation of one. Table 2 shows that treated

respondents show a significantly lower level of perceived effectiveness. The treatment effect is a substantively sizable 0.25 standard deviations. When we restrict the sample to underestimators—respondents who initially underestimated the competitor's effort level and learned that the competition will do more—the estimated effect size increases to 0.31 standard deviations. The large reduction in activists' perceptions about their ability to drive political change, detected two months after the election, provides suggestive evidence that increased party competition, indeed, lowered activists' perceived effectiveness and thereby dampened engagement.

Table 2: Treatment effects on perceived effectiveness

	Ability to make political change			
	Pooled sample		*Underestimators*	
	(1)	(2)	(3)	(4)
	Without Controls	*With Controls*	*Without Controls*	*With Controls*
Treatment	-0.273*	-0.245*	-0.339**	-0.314**
	(0.143)	(0.145)	(0.149)	(0.151)
Control mean	0.131	0.131	0.150	0.150
Observations	196	196	180	180
Controls	No	Yes	No	Yes

Notes: Table 2 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing our measure of perceived effectiveness on the treatment for individuals who responded to the post-election survey. Columns 1 and 2 present the estimates for the full sample. Columns 3 and 4 present estimates for underestimators. Perceived effectiveness is measured using respondents' agreement to the statement: "You can change political circumstances by becoming politically active." Answers were scored on a seven-point Likert-scale ranging from 'do not agree at all' to 'fully agree.' The outcome is standardized. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Substitution to other effort domains

We provided robust evidence that increased party competition leads the supporters of a political party to shy away from canvassing. This evidence raises an important follow-up question: did party supporters abstain from the campaign entirely or did they merely shift their effort to other modes of campaigning? Canvassing is one of the most effective forms of campaigning (Green et al., 2013). But perhaps a rise in competitor effort on the streets leads party supporters to choose new channels to contribute to the campaign? This may be particularly relevant if canvassers want to avoid fierce competition.

To test for this substitution effect, we use a second feature of the canvassing app. In particular, the app also gave party supporters an opportunity to share party news stories on Facebook. As shown in Tables A14 and A15, we find small and insignificant treatment effects on activism on social media. Treated respondents were no more likely to share stories about the party on Facebook. The evidence thus implies that treated individuals did *not* shift their effort toward other forms of campaigning, in this case, social media. Rather, they abstained from any engagement.

Ethical considerations

Field experiments are an excellent method for drawing causal inferences. But they also raise tough ethical questions because researchers intervene in (rather than observe) the real world. In our case, ethical considerations were particularly pressing because our study could have had an impact on the election. We therefore carefully considered the ethical dimension of our study which we want to discuss before concluding. While we obtained ethical approval at the University of Oxford, we still want to reflect on two particular ethical issues: potential effects on the election and subjects' non-information about participation in an experiment.

First, implementing the survey meant that we intervened in an electoral campaign. Were we justified in doing so? Importantly, the survey among party supporters would have taken place with or without our presence. The party regularly engages its supporters using emails, surveys and phone calls. We simply advised the party on how to best implement the survey. The ultimate decision to launch the survey, however, was made by party officials. There was also no power differential, which could have led the party to feel obligated to implement the survey. At the time, all authors were graduate students and the party is one of Europe's largest with a highly professional team of campaigners.

Second and related, the expected sample size meant that it was exceedingly unlikely for the study to have any effect on the election. Today, we know that this calculation was correct. Controlling for pre-specified covariates, we do not find any aggregate impact on doors (column (6) Table 1). Even if we take the results without controls, the treatment group knocked on 3.6 fewer doors. Assuming a persuasion rate of 10 percent based on Pons (2018), this means that the experiment lowered the party's number of votes by 258. This means not a single constituency would have elected a different candidate had the study not taken place. The national share of the party was also entirely unaffected (up to the 04ths. digit). All this is not to say that the survey was without *any* effect. We did, after all, intervene in the real world. But it strikes us that the scientific insights—presented above—were sufficiently high to justify our intervention.

Third, the survey did not deceive subjects. Party supporters were provided with truthful information about the effort of the main competitor. If anything, the study thus provided a public good to party supporters. Study participants—who were contacted online—were also entirely free in their decision to participate in the study. The party did not, however, inform subjects that the data would also be used for scientific purposes. This non-information worked in our favor by preserving the natural field setting "where the environment is one where the subjects [...] do

not know that they are in an experiment" (Harrison and List, 2004, p. 1014). That said, we hope that i) by avoiding any harm, ii) by allowing subjects to freely choose to participate, and iii) by maintaining the confidentiality of all subjects including the party and country, we were justified to stomach this non-information (decided upon by the party) in order to explore an important question in political science.

Conclusion

This paper has provided evidence that increased party competition makes party supporters *less* likely to join the campaign trail. We conducted a field experiment with a major European party during a recent national electoral campaign. In the experiment, party supporters where randomly assigned to true information about the canvassing intentions of members of the major competitor party. The information indicated that the canvassing effort by the competitor party was exceptionally high. Given that the party we cooperated with was leading in the polls, the treatment therefore increased the perceived competitiveness of the upcoming election. Using unobtrusive, real-time data on respondents' canvassing behavior, we found that treated respondents are five percentage points less likely to go canvassing. We also provide suggestive evidence as to why activists reduced their engagement: increased competition meant that activists felt less effective.

A natural follow-up question is whether our main finding generalizes to the broader population (Van Haute and Gauja, 2015). To address generalizability, we therefore compared our sample to a general population panel survey in the country of study. Relative to an equal split of men and women in the general population (49% men), our sample is predominantly male with only 23% women. With an average age of 40, our sample is also much younger relative to the average age in the population. Finally, we also note that our sample's respondents below the median age are 0.1 SD more likely to believe that social and political activism

influences societal conditions. Given that men in the general population are 5%-points more likely to support a party and also exhibit a significantly higher interest in politics (+ 0.39 SD), our sample thus likely captures highly active and interested party supporters. Taken together, these statistics indicate that a general population sample might likely be less responsive to changes in political competition.

A second and related question is whether our main outcome—engagement in a canvassing campaign—generalize to other forms of political activism as well as to different types of electoral systems. Reassuringly, we found that there are no substitution effects to online campaigning. This makes it plausible that the treatment led potential supporters to abstain from any campaign engagement. We cannot answer, however, whether the treatment would have worked differently in other electoral systems. Fortunately, the country of study uses a mixed electoral system. There is thus hope that the results apply under both proportional and majoritarian representation. But further evidence is necessary to settle this question.

With these questions in mind, we want to conclude our study with a word on normative implications. If political activists reduce their engagement when competition increases, what does this mean for the democratic political process? If taken at face value, our finding implies that fierce competition may not help spur democratic engagement. Perhaps citizens prefer a more consensual, communicative political process (Habermas, 1985). Given that politics is not, or at least should not be, a zero-sum-game, excessive campaign effort by one party may thus do more harm than good in terms of fostering political engagement.

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Online Appendix

Additional tables

Table A1: Summary statistics

	Mean	Min.	Max.	Obs.
Covariates:				
Female	0.23	0	1	1,417
Age (#)	40.17	16	99	1,417
Party member	0.82	0	1	1,417
Years of membership (#)	11.57	0	60	1,417
Experienced canvasser	0.37	0	1	1,417
Participated in workshop	0.22	0	1	1,417
Downloaded app	0.28	0	1	1,417
Prior belief about competitor	21.32	0	100	1,417
Survey outcomes:				
Posterior belief about competitor	17.91	0	100	1,406
Planned canvassing	0.53	0	1	1,402
Planned days (#)	4.13	0	60	1,402
Behavioral outcomes:				
Any canvassing	0.14	0	1	1,417
Cavassed days (#)	0.65	0	32	1,417
Canvassed doors (#)	32.36	0	1,045	1,417

Notes: Table 1 presents summary statistics for the full sample. Variables are given in percent, unless stated otherwise.

Table A2: Balance tests

	Treatment	Control	P-value (T = C)
Female	0.23	0.23	0.970
Age	40.44	39.92	0.604
Is party member	0.81	0.84	0.120
Years of party membership	11.72	11.43	0.698
Has experience canvassing	0.37	0.38	0.664
Participated in canvassing workshop	0.21	0.22	0.853
Downloaded app before survey	0.27	0.30	0.182
Has canvassed before survey	0.09	0.10	0.410
Days canvassed before survey	0.25	0.28	0.685
Doors visited before survey	10.20	11.06	0.892
Prior belief: competition	20.39	22.23	0.139

Notes: Table A2 presents all available pre-treatment covariates across the treatment and control group, the p-value is based on a t-test comparing the difference-in-means between the two groups. A regression of the treatment indicator on all covariates yields an insignificant p-value for the F-test of joint significance of 0.471.

Table A3: Treatment effects on app download

	Survey	App Data		
	click on app-link	within 24h	within one week	any time after survey
Treatment	0.007	-0.007	-0.004	-0.005
	(0.010)	(0.007)	(0.008)	(0.012)
Observations	1,417	1,417	1,417	1,417
Control group mean	0.04	0.02	0.03	0.06

Notes: Table A3 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing all outcome variables related to app-download on the treatment dummy for the full sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A4: Charcteristics of app users

	App	No App	P-value(App = No App)
Female	0.22	0.24	0.510
Age	33.18	43.65	0.000
Is party member	0.89	0.81	0.003
Years of party membership	7.95	13.36	0.000
Has experience canvassing	0.46	0.33	0.000
Participated in door-to-door workshop	0.36	0.14	0.000
Belief: competition intentions	19.70	23.63	0.029
Belief: competition actual	13.46	16.40	0.044
Canvassing: yes	0.82	0.35	0.000
Canvassing: days	6.83	2.47	0.000

Notes: Table A4 presents differences between respondents who downloaded the app (256 supporters) and respondents who never downloaded the app (462 supporters) in the control group. p-values are based on robust standard errors.

Table A5: Treatment effects on behavior with additional controls - app user sample

	Any canvassing		Days canvassed		Door knocked	
	(1) *Without Controls*	(2) *With Controls*	(3) *Without Controls*	(4) *With Controls*	(5) *Without Controls*	(6) *With Controls*
Treatment	-0.091**	-0.080*	-0.126	0.018	0.317	7.579
	(0.046)	(0.044)	(0.421)	(0.417)	(21.833)	(21.545)
Control mean	0.462	0.462	2.052	2.052	98.466	98.466
Observations	465	465	465	465	465	465
Controls	No	Yes	No	Yes	No	Yes

Notes: Table A5 presents coefficients, robust standard errors (in parentheses) and randomization inference based p-values (in brackets) of a linear model (OLS), regressing the indicated behavioral outcomes on the treatment dummy for the sample with valid location data (97% of people that downloaded the application). Columns 1, 3, and 5 show the specification without control variables. Columns 2, 4, and 6 include all pre-specified control variables and a measure of marginality of the district (a dummy whether the vote share difference between the party and its strongest competitor is within five percentage points). Outcome data are obtained through a smartphone application used by the canvassers to register knocked doors. "Any canvassing" refers to any recorded canvassing activity. "Days canvassed" refers to the number of canvassed days. "Doors knocked" refers to the number of knocked doors winsorized at the 99th percentile. *p<0.1; **p<0.05; ***p<0.01.

Table A6: Treatment effects using logit estimation

	Any canvassing	
	(1)	(2)
Treatment	-0.389**	-0.339*
	(0.156)	(0.190)
Marginal effect at mean	-0.046	-0.028
Control mean	0.160	0.160
Observations	1417	1417
Controls	No	Yes

Notes: Table A6 presents coefficients of logit estimation with robust standard errors in parentheses. In columns 1 and 2 we estimate a logit regression of a dummy indicating any canvassing on the treatment dummy. Column 1 shows the specification without control variables. Column 2 includes all pre-specified control variables. Outcome data are obtained through a smartphone application used by the canvassers to register knocked doors. "Any canvassing" refers to any recorded canvassing activity. *p<0.1; **p<0.05; ***p<0.01.

Table A7: Impact on post-treatment beliefs

	Full sample		Underestimators		Overestimators	
	(1) *Without Controls*	(2) *With Controls*	(3) *Without Controls*	(4) *With Controls*	(5) *Without Controls*	(6) *With Controls*
Treatment	5.193***	5.091***	7.898***	7.796***	-15.134***	-15.716***
	(0.954)	(0.946)	(0.730)	(0.725)	(3.452)	(3.598)
Control mean	15.354	15.354	10.389	10.389	56.429	56.429
Observations	1406	1406	1261	1261	145	145
Controls	No	Yes	No	Yes	No	Yes

Notes: Table A7 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing the posterior beliefs on the treatment dummy. Columns (1) and (2) display the results for all respondents. Columns (3) and (4) display results for respondents who underestimated the information provided on competing party members' canvassing intentions. Columns (5) and (6) display results for respondents who underestimated the information provided on competing party members' canvassing intentions. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A8: Heterogeneity by pre-treatment belief

	Any canvassing		Days canvassed		Door knocked	
	Without Controls	*With Controls*	*Without Controls*	*With Controls*	*Without Controls*	*With Controls*
Treatment	-0.048**	-0.035**	-0.136	-0.071	-5.214	-1.968
	(0.020)	(0.017)	(0.161)	(0.149)	(8.043)	(7.491)
Over-estimator	-0.063*	-0.039	-0.419**	-0.305*	-14.742	-8.482
	(0.038)	(0.030)	(0.194)	(0.169)	(15.238)	(14.000)
Treatment × Over-estimator	0.016	0.020	0.161	0.246	14.850	19.294
	(0.051)	(0.045)	(0.284)	(0.278)	(22.694)	(21.210)
Effect on over-estimator	-0.031	-0.014	0.025	0.175	9.636	17.326
	(0.047)	(0.042)	(0.235)	(0.234)	(21.221)	(19.940)
Control mean	0.160	0.160	0.712	0.712	34.148	34.148
Observations	1,417	1,417	1,417	1,417	1,417	1,417
Controls	No	Yes	No	Yes	No	Yes

Notes: Table A8 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing the indicated outcomes on the treatment interacted with a dummy for overestimation. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. The sample is restricted to the control group. *p<0.1; **p<0.05; ***p<0.01.

Table A9: Selection into post-election survey

	Responded to post-election survey	
	Without Controls	*With Controls*
Treatment	-0.007	-0.007
	(0.018)	(0.018)
Control mean	0.143	0.143
Observations	1,406	1,406
Controls	No	Yes

Notes: Table A9 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing a dummy capturing participation in the post-election survey on the treatment dummy. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A10: Selection into post-election survey (underestimators)

	Responded to post-election survey	
	Without Controls	*With Controls*
Treatment	-0.010	-0.010
	(0.020)	(0.020)
Control mean	0.148	0.148
Observations	1,261	1,261
Controls	No	Yes

Notes: Table A10 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing a dummy capturing participation in the post-election survey on the treatment dummy. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. The sample is restricted to underestimators. *p<0.1; **p<0.05; ***p<0.01.

Table A11: Balance in post-election survey

	Treatment	Control	P-value (T = C)
Female	0.18	0.25	0.274
Age	44.74	42.43	0.426
Is party member	0.85	0.84	0.878
Years of party membership	14.89	13.06	0.414
Has experience canvassing	0.45	0.45	0.954
Participated in door-to-door workshop	0.31	0.25	0.408
Downloaded app before survey	0.36	0.32	0.576
Has canvassed before survey	0.09	0.12	0.452
Days canvassed before survey	0.21	0.21	0.964
Doors visited before survey	2.31	3.66	0.612
Prior belief: competition	18.55	20.14	0.587

Notes: Table A11 presents all available covariates across the treatment and control group in the post-election survey, which was implemented two months after the election. We report the full sample. The p-value is based on a t-test comparing the difference-in-means between the two groups. A regression of the treatment indicator on all covariates yields an insignificant p-value for the F-test of joint significance of 0.801.

Table A12: Balance in post-election survey (underestimators)

	Treatment	Control	P-value (T = C)
Female	0.20	0.22	0.674
Age	44.41	42.14	0.452
Is party member	0.85	0.85	0.967
Years of party membership	15.22	12.90	0.316
Has experience canvassing	0.48	0.45	0.689
Participated in door-to-door workshop	0.31	0.26	0.387
Downloaded app before survey	0.35	0.32	0.675
Has canvassed before survey	0.08	0.12	0.426
Days canvassed before survey	0.22	0.21	0.960
Doors visited before survey	2.51	3.93	0.625
Prior belief: competition	13.88	16.11	0.293

Notes: Table A12 presents all available covariates across the treatment and control group in the post-election survey, which was implemented two months after the election. We report the underestimator sample. The p-value is based on a t-test comparing the difference-in-means between the two groups. A regression of the treatment indicator on all covariates yields an insignificant p-value for the F-test of joint significance of 0.767.

Table A13: Correlation between canvassing behavior and beliefs about competitor effort (control group)

	Any canvassing		Days canvassed		Door knocked	
	(1) *Without Controls*	(2) *With Controls*	(3) *Without Controls*	(4) *With Controls*	(5) *Without Controls*	(6) *With Controls*
Posterior belief	-0.002***	-0.001**	-0.013***	-0.007**	-0.671***	-0.359**
	(0.001)	(0.000)	(0.003)	(0.003)	(0.165)	(0.149)
Control mean	0.160	0.160	0.712	0.712	34.148	34.148
Observations	714	714	714	714	714	714
Controls	No	Yes	No	Yes	No	Yes

Notes: Table A13 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing the indicated behavioral outcomes on control group respondents' beliefs about the share of competitor party members who will go canvassing during the campaign (posterior belief). Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this election and whether a participant has canvassed in the current election. The sample is restricted to the control group. *p<0.1; **p<0.05; ***p<0.01.

Table A14: Effects on social media activity

	Shared social media message		
	Any	Days	Total
Treatment	-0.004	0.130	0.297
	(0.012)	(0.115)	(0.222)
Control mean	0.075	0.306	0.703
Observations	1417	1417	1417

Notes: Table A14 presents treatment effects on social media activity. *"Any"* takes value one if the respondent shares any party news story on Facebook through the application. *"Days"* denotes the total number of days a respondent shares a party news story on Facebook through the application. *"Total"* is the total number of party news stories shared by the respondent on Facebook through the application. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

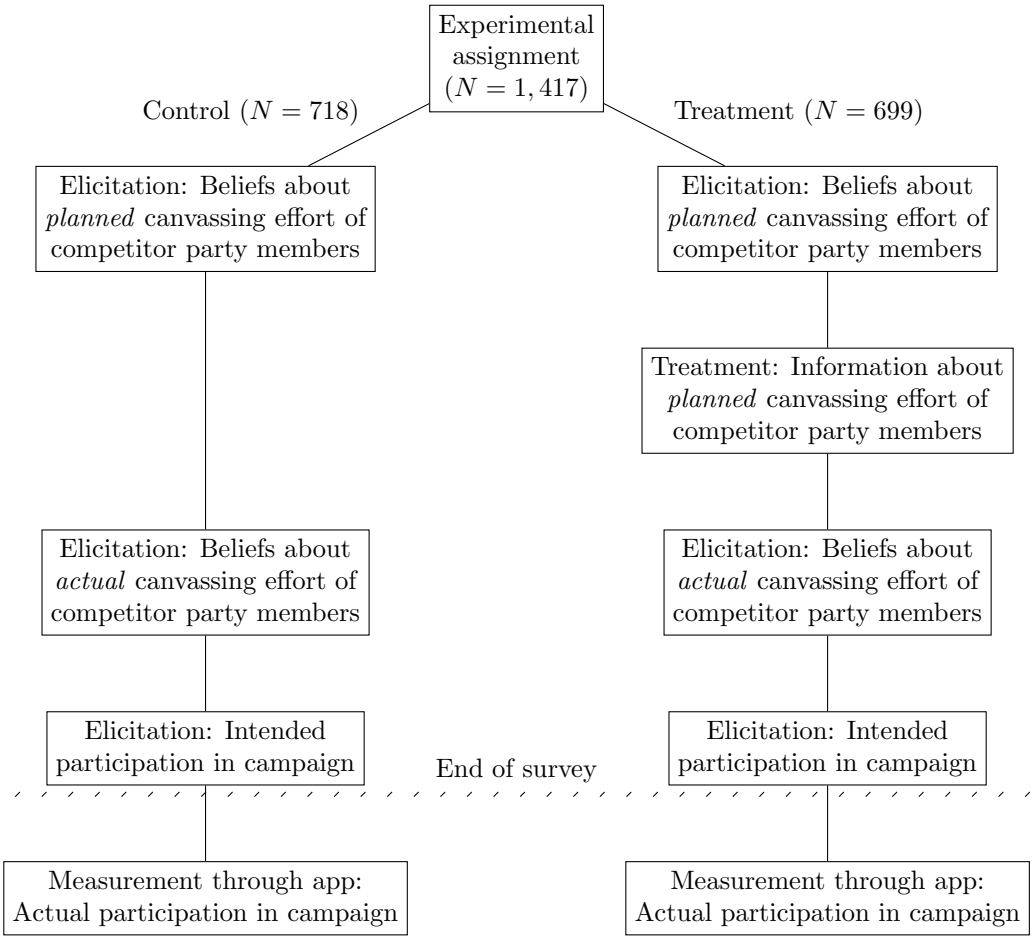
Table A15: Effects on social media activity (underestimators only)

	Shared social media message		
	Any	Days	Total
Treatment	-0.004	0.132	0.295
	(0.013)	(0.123)	(0.242)
Control mean	0.078	0.329	0.750
Observations	1271	1271	1271

Notes: Table A15 presents treatment effects on social media activity for respondents who underestimate the share of competitor party members who plan to participate in the party's door-to-door canvassing campaign. *"Any"* takes value one if the respondent shares any party news story on Facebook through the application. *"Days"* denotes the total number of days a respondent shares a party news story on Facebook through the application. *"Total"* is the total number of party news stories shared by the respondent on Facebook through the application. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

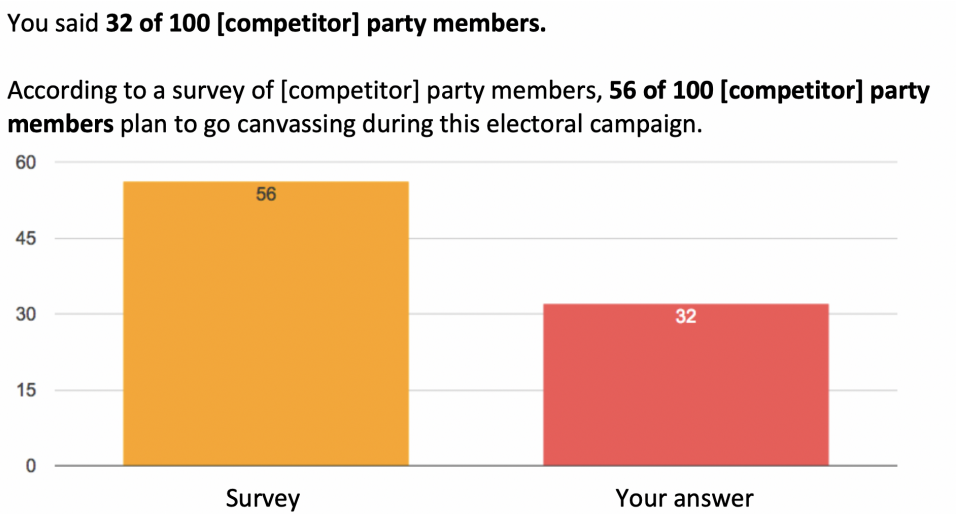
Additional Figures

Figure A.1: Experimental design



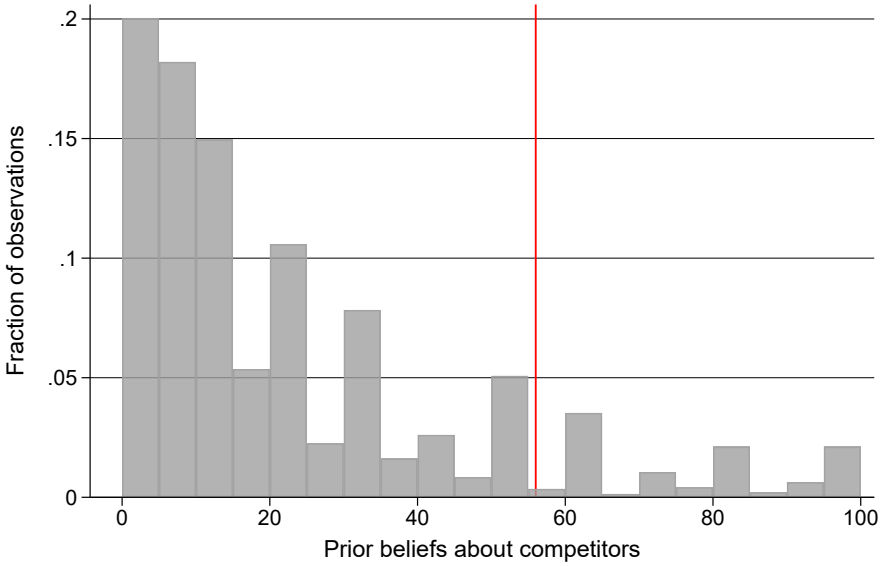
Notes: Figure A.1 illustrates the experimental design.

Figure A.2: Treatment screen



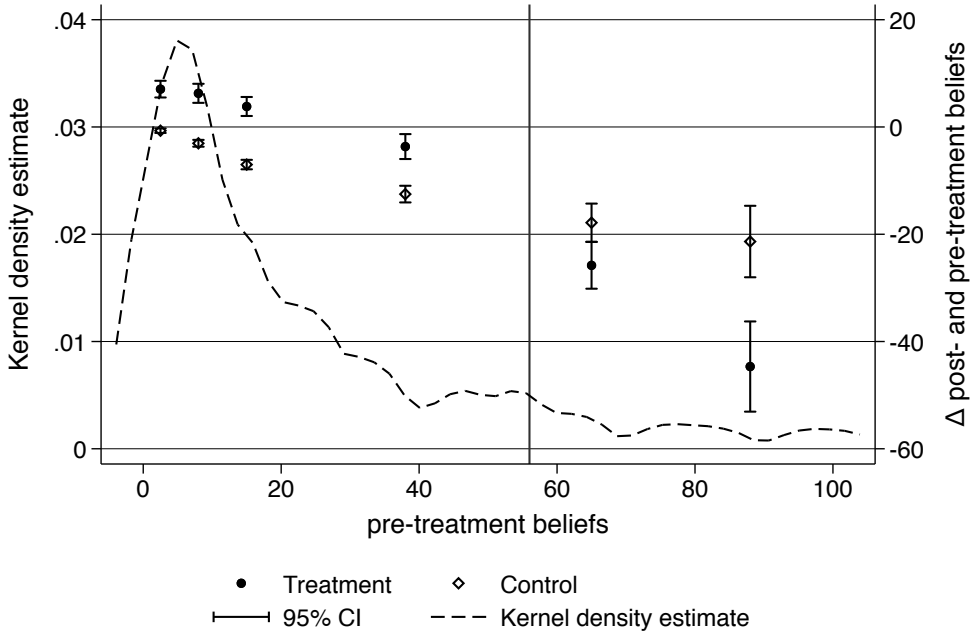
Notes: Figure A.2 displays an exemplary treatment screen for a respondent who beliefs that 32 percent of members of the competitor party will go canvassing.

Figure A.3: Distribution of pre-treatment beliefs about competitor effort



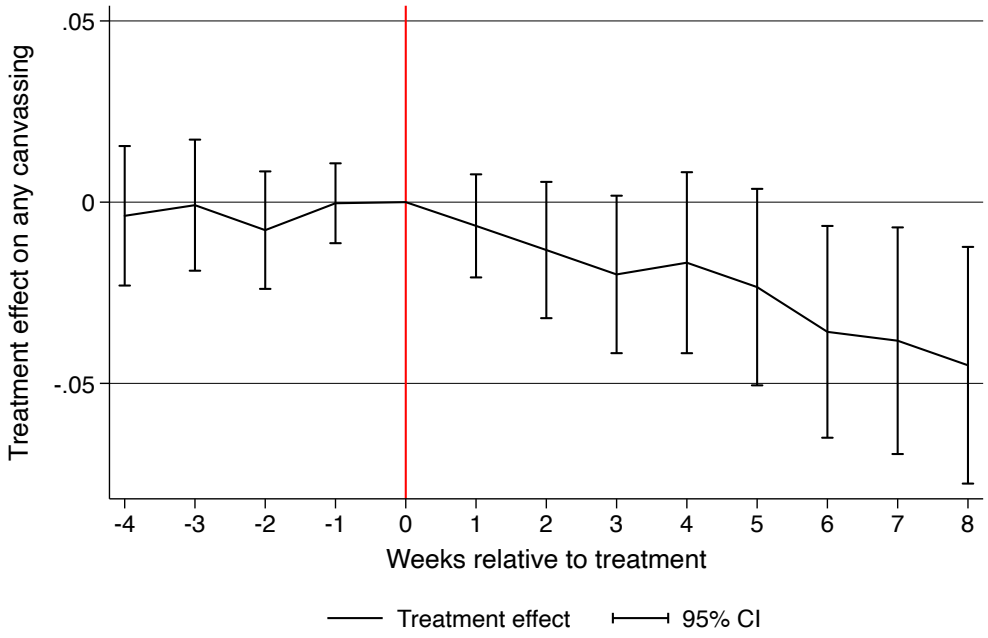
Notes: Figure A.3 shows a histogram of pre-treatment beliefs about the fraction of competitor party members who plan to go canvassing. The vertical red line (56 percent) corresponds to the treatment information.

Figure A.4: Belief changes over pre-treatment beliefs



Notes: Figure A.4 shows average difference between post- beliefs and pre-treatment beliefs the fraction of members of the competitor party who plan to go canvassing in the treatment and control group. The vertical line (56 percent) corresponds to the true treatment information, which is based on survey evidence. Respondents are grouped according to treatment beliefs in six bins. Respondents who underestimate the treatment information are grouped in quartiles. Respondents who underestimate the treatment information are grouped in below and above median pre-treatment beliefs.

Figure A.5: Treatment effects on any canvassing over time



Notes: Figure A.5 plots the treatment effects on any canvassing over time using a difference-in-differences specification that controls for individual fixed effects. The sample is restricted to underestimators. The black vertical lines indicate 95% confidence intervals. The vertical red line indicates the timing of the treatment. The election took place in week eight.

Heterogeneity

Did the treatment yield greater behavioral changes among specific subgroups? To streamline the heterogeneity analysis, we focus on treatment-by-covariate interactions for respondents' participation decision. Using the covariate data at our disposal, this allows us to scrutinize eight subgroups. Four of these subgroups were pre-registered: respondents that had downloaded the app (Table A16), respondents with prior canvassing experience (Table A17), respondents that are party members (Table A18), and respondents' years of membership (Table A19). For the sake of completeness, we report the effect of all potential interactions on the participation decision in Table A20.

Table A16: Treatment effects (app heterogeneity)

	Posterior	Intentions		App Data		
	Belief	Any	Days	Any	Days	Door
Panel A: No app download						
Treatment	5.119***	0.043	0.158	-0.017	-0.031	-3.076
	(1.146)	(0.027)	(0.338)	(0.011)	(0.068)	(3.696)
Control mean	16.454	0.384	2.722	0.044	0.143	7.484
Observations	1,009	1,006	1,006	1,017	1,017	1,017
Panel B: App download						
Treatment	5.513***	0.037	0.975	-0.065	0.007	12.961
	(1.667)	(0.034)	(0.833)	(0.047)	(0.444)	(23.072)
Control mean	12.750	0.839	7.087	0.435	2.051	96.944
Observations	397	396	396	400	400	400

Notes: Table A16 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing all available outcome variables on the treatment dummy for the indicated sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A17: Treatment effects (experience heterogeneity)

	Posterior	Intentions		App Data		
	Belief	Any	Days	Any	Days	Door
Panel A: Inexperienced supporters						
Treatment	6.114***	0.012	0.560*	-0.030	-0.012	1.944
	(1.240)	(0.027)	(0.335)	(0.018)	(0.142)	(7.577)
Control mean	15.090	0.407	2.736	0.130	0.487	23.785
Observations	881	877	877	888	888	888
Panel B: Experienced supporters						
Treatment	3.767**	0.096***	-0.071	-0.036	-0.048	-1.735
	(1.468)	(0.036)	(0.675)	(0.028)	(0.271)	(13.921)
Control mean	15.786	0.701	6.097	0.210	1.081	51.140
Observations	525	525	525	529	529	529

Notes: Table A17 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing all available outcome variables on the treatment dummy for the indicated sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A18: Treatment effects (membership heterogeneity)

	Posterior	Intentions		App Data		
	Belief	Any	Days	Any	Days	Door
Panel A: No member						
Treatment	1.777	-0.067	-0.478	0.009	0.051	-0.810
	(2.551)	(0.052)	(0.598)	(0.031)	(0.158)	(8.978)
Control mean	18.609	0.381	2.929	0.078	0.267	15.948
Observations	246	244	244	251	251	251
Panel B: Party member						
Treatment	5.757***	0.071***	0.584	-0.041**	-0.065	0.220
	(1.013)	(0.024)	(0.391)	(0.018)	(0.160)	(8.360)
Control mean	14.730	0.545	4.223	0.176	0.797	37.654
Observations	1,160	1,158	1,158	1,166	1,166	1,166

Notes: Table A18 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing all available outcome variables on the treatment dummy for the indicated sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A19: Treatment effects (membership years heterogeneity)

	Posterior	Intentions		App Data		
	Belief	Any	Days	Any	Days	Door
Panel A: Below med. membership dur.						
Treatment	6.714***	-0.001	0.268	-0.040	0.088	5.724
	(1.288)	(0.030)	(0.449)	(0.024)	(0.222)	(11.577)
Control mean	14.561	0.570	4.503	0.206	0.873	43.285
Observations	737	735	735	744	744	744
Panel B: Above med. membership dur.						
Treatment	3.391**	0.090***	0.430	-0.027	-0.161	-5.434
	(1.394)	(0.032)	(0.487)	(0.019)	(0.158)	(8.063)
Control mean	16.237	0.463	3.478	0.109	0.531	23.932
Observations	669	667	667	673	673	673

Notes: Table A19 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing all available outcome variables on the treatment dummy for the indicated sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Table A20: Treatment effect heterogeneity

	Any canvassing							
Treatment	-0.027	-0.067*	0.009	-0.048**	-0.031*	-0.019	-0.032**	-0.017
	(0.018)	(0.039)	(0.031)	(0.021)	(0.018)	(0.015)	(0.015)	(0.011)
T × Female	-0.021							
	(0.037)							
T × Age		0.001						
		(0.001)						
T × Member			-0.050					
			(0.036)					
T × Membership years				0.001				
				(0.001)				
T × Experience					-0.004			
					(0.033)			
T × Canvassing workshop						-0.062		
						(0.048)		
T × Has canvassed this election							-0.005	
							(0.084)	
T × Downloaded app before survey								-0.055
								(0.048)
R-squared	0.284	0.285	0.285	0.285	0.284	0.286	0.284	0.285
Observations	1,417	1,417	1,417	1,417	1,417	1,417	1,417	1,417

Notes: Table A20 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing the indicated behavioral outcome (any canvassing) on the treatment dummy interacted with the indicated covariates for the full sample. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, gender, whether a participant has participated in canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Theoretical model

Set-up

How does party competition affect a party supporter's decision to become politically active? To structure our thinking, consider a potential activist i whose utility depends on the outcome of an election with two competing parties. The utility gained from the election is a function of the number of votes $v(\cdot)$, which is described by $g(v(d_i + d_{-i}, cd))$. $g(\cdot)$ determines how effective votes are in winning the election or reaching the political outcome. The vote share for i's party, $v(d_i + d_{-i}, cd)$, depends on her canvassing effort level, $d_i \geq 0$, the effort of other activists in i's party (d_{-i}), as well as the canvassing level of the competitor party cd. We further allow for expressive utility $k(d_i, cd)$ which captures non-instrumental benefits. Finally, we include individual-specific fixed costs of engaging in any canvassing $\tilde{c}_i$, which are distributed according to F, and continuous costs as a function of canvassing effort $c(d_i)$. Following this simple setup, activist i's utility can be expressed as follows:

$$u_i(d_i, d_{-i}, cd) = g\left(v(d_i + d_{-i}, cd)\right) + k(d_i, cd) - c(d_i) - \tilde{c}_i 1(d_i > 0) \tag{1}$$

Canvassing effort choice

Conditional on participating in canvassing, i chooses the canvassing effort according to the following FOC:

$$\frac{du_i(d_i, d_{-i}, cd)}{dd_i} = \frac{\partial g(v(d_i^* + d_{-i}, cd))}{\partial v} \frac{\partial v(d_i^* + d_{-i}, cd)}{\partial d_i} + \frac{\partial k(d_i^*, cd)}{\partial d_i} - \frac{dc(d_i^*)}{dd_i} = 0 \tag{2}$$

From equation 2 we see that i's effort choice depends on the marginal utility gained from vote shares, the effectiveness of her canvassing actions in gaining additional vote shares, and on her expressive benefits. To classify the response to an increase in competition, we consider the following high-level assumptions.

1. Rational: people care about winning the election.
2. Effectiveness: canvassing gains you votes.
3. Concavity: the marginal utility of additional vote shares is decreasing. This corresponds to the assumption that the party is ahead in the polls (which

was the case in our setting). Furthermore, the marginal impact on voter persuasion decreases in each additional unit of canvassing effort.

4. Change in effectiviness: canvassing by the opposing party changes the effectiveness of one's own canvassing.

5. Expressive motives: competition can either increase or decrease the expressive value of own canvassing.

6. Self-limiting expressive motives: own canvassing does not increase the expressive value of further own canvassing. If that were not the case, canvassers might motivate themselves to knock on infinitely many doors.

With these assumptions and implicit differentiation we get an ambiguous theoretical prediction about the impact of an increase in competition on the canvassing effort decision.

$$\frac{dd_i^*}{dcd} = -\frac{\overbrace{\overbrace{\underbrace{\frac{\partial^2 g(v(\cdot))}{(\partial v(\cdot))^2}}_{<0,\text{ by 3.}}\underbrace{\frac{\partial v(\cdot)}{\partial cd}}_{<0,\text{ by 2.}}\underbrace{\frac{\partial v(\cdot)}{\partial d_i}}_{>0,\text{ by 2.}}}^{>0,\text{ this is the closeness effect}} + \overbrace{\underbrace{\frac{\partial g(v(\cdot))}{\partial v(\cdot)}}_{>0,\text{ by 1.}}\underbrace{\frac{\partial^2 v(\cdot)}{\partial d_i \partial cd}}_{<0,\text{ by 4.}}}^{<0\text{ if less effective, this is the decreased effectiveness}} + \overbrace{\frac{\partial^2 k(d_i, cd)}{\partial d_i \partial cd}}^{0\leqslant,\text{ by 5.}}}{\underbrace{\underbrace{\underbrace{\frac{\partial^2 g(\cdot))}{(\partial v(\cdot))^2}}_{<0,\text{ by 3.}}\underbrace{\left(\frac{\partial v(\cdot)}{\partial d_i}\right)^2}_{>0,\text{quadratic}}}_{<0} + \underbrace{\underbrace{\frac{\partial g(v(\cdot))}{\partial v(\cdot)}}_{>0,\text{ by 1.}}\underbrace{\frac{\partial v(\cdot)}{\partial d_i \partial d_i}}_{\leq 0,\text{ by 3.}}}_{\leq 0} + \underbrace{\frac{\partial^2 k(d_i, cd)}{(\partial d_i)^2}}_{0\leq,\text{ by 6.}} - \underbrace{\frac{d^2 c(d_i^*)}{(dd_i)^2}}_{\geq 0}}_{0<}}$$

The denominator is unambiguously negative, which means that the sign of the enumerator determines the nature of the strategic interactions. If instrumental motives do not play a role, it is only the nature of expressive motives that determines the whether competition increases or decreases canvassing activity. If instrumental concerns do play a role, the closeness and reduced effectiveness effects also play a role in determining the sign of the interaction. If the closeness effect is strongest an increase in competition will lead to an increase in canvassing activity. However, if effectiveness is decreasing in higher competitor effort, the effect of decreased effectiveness will lead to a decrease in canvassing activity. Finally, it is also conceivable that effectiveness increases in competitor effort, which will reinforce a positive effect of competition on canvassing activity.

Participation decision

To investigate the impact of changes in competition on the participation decision, we explore the role of fixed cost $\tilde{c}_i$. The fraction of individuals going canvassing at a given optimal canvassing level d^* is determined by the difference in utility between participating and non-participating. The marginal activist should just be indifferent between the two.

$$\Delta u = u(d^*, d_{-i}, cd) - u(0, d_{-i}, cd) = g\left(v(d_i^* + d_{-i}, cd)\right) + k(d_i^*, cd) - c(d_i^*) - \tilde{c}_i \\ -g\left(v(d_{-i}, cd)\right) - k(0, cd) = 0$$

We assume that $k(0, cd) = 0 \; \forall cd$, that is individuals do not gain any expressive utility if they do not canvass. Using the distributional assumption on $\tilde{c}_i$, we obtain the following equation for the fraction of active canvassers.

$$F(g\left(v(d_i^* + d_{-i}, cd)\right) + k(d_i^*, cd) - c(d_i^*) - g\left(v(d_{-i}, cd)\right) \tag{3}$$

To explore the impact on the participation decision, we take the first derivative of F with respect to cd.

$$\begin{aligned}\frac{dF}{dcd} =& [\frac{\partial g(v(d_i^* + d_{-i}, cd))}{\partial v}\left(\frac{\partial v(d_i^* + d_{-i}, cd)}{\partial cd} + \frac{\partial v(d_i^* + d_{-i}, cd)}{\partial d_i^*}\frac{\partial d_i^*}{\partial cd}\right) \\ &+ \frac{\partial k(d_i^*, cd)}{\partial cd} + \frac{\partial k(d_i^*, cd)}{\partial d_i^*}\frac{\partial d_i^*}{\partial cd} - \frac{dc(d_i^*)}{dd_i^*}\frac{\partial d_i^*}{\partial cd} - \frac{g(v(d_{-i}, cd))}{\partial v}\frac{\partial v(d_{-i}, cd)}{\partial cd}] \\ &\cdot f(\cdot)\end{aligned}$$

Using the first order condition 2, this can be simplified to:

$$\begin{aligned}\frac{dF}{dcd} =& [\frac{\partial g(v(d_i^* + d_{-i}, cd))}{\partial v}\frac{\partial v(d_i^* + d_{-i}, cd)}{\partial cd} + \frac{\partial k(d_i^*, cd)}{\partial cd} - \frac{g(v(d_{-i}, cd))}{\partial v}\frac{\partial v(d_{-i}, cd)}{\partial cd}] \\ &\cdot f(\cdot)\end{aligned}$$

Given our previous assumptions on concavity, we know that $0 < \frac{\partial g(v(d_i^* + d_{-i}, cd))}{\partial v} < \frac{\partial g(v(d_{-i}, cd))}{\partial v}$. However, the relative effect of competition on the party's own vote share is ambiguous $\frac{\partial v(d_i^* + d_{-i}, cd)}{\partial cd} \lessgtr \frac{\partial v(d_{-i}, cd)}{\partial cd} < 0$. Hence, the sign of the impact on the

participation decision depends on the sum of two factors. First, the sign depends on whether the effect of competition on additional votes generate (effectiveness) increases or decreases in own canvassing. Second, the sign and magnitude of the direct impact of competition on the expressive utility. Finally, the magnitude of the effect is pinned down by the density function at the fixed cost value of the marginal (or indifferent) canvasser.

Demand effects

In this section, we discuss one methodological facet of our study. As stated, in addition to collecting rich behavioral data, the original survey also included two self-reported outcomes. Specifically, we asked respondents whether they planned to go canvassing and, if so, on how many days. Do the behavioral findings map onto respondents' self-reported intentions?[24]

In Table A21, we report treatment effects on respondents' intentions to go canvassing. In contrast to the behavioral finding, we do *not* find a negative treatment effect on canvassing intentions. If anything, there is a slight positive effect (though the coefficient is insignificant without control variables). This short-term effect may be a product of social pressure induced by the surveyor: Respondents might want to please the party in reaction to learning about high levels of competitor effort. In reality, however, they dropped out of the campaign. These results underscore the necessity to collect unobtrusive behavioral data in order to reliably measure political engagement. Relying on self-reported intentions to predict engagement would have led to the wrong conclusion, namely, that the competition treatment mildly increased engagement.

[24]In the pre-analysis plan, we pre-specified an index, which combines the behavioral and survey data. We had anticipated that intentions and behaviors point into the same direction. But, given that the survey responses are at odds with behavior, the index is of little empirical use.

Table A21: Treatment effects on self-reported intentions

	Planned canvassing		Planned days	
	(1)	(2)	(3)	(4)
Treatment	0.027	0.046**	0.235	0.418
	(0.027)	(0.022)	(0.378)	(0.340)
Control mean	0.519	0.519	4.017	4.017
Observations	1,402	1,402	1,402	1,402
Controls	No	Yes	No	Yes

Notes: Table A21 presents coefficients and robust standard errors (in parentheses) of a linear model (OLS), regressing the indicated self-reported intentions on the treatment dummy for the full sample. "Planned canvassing" is a dummy indicating if respondents plan to go canvassing. "Planned days" is a continuous variable measuring the number of days respondents plan to go canvassing. Pre-specified control variables include: party membership, number of years of party membership, age, gender, whether a participant has participated in a canvassing training, whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this national election and whether a participant has canvassed in the current election. *p<0.1; **p<0.05; ***p<0.01.

Survey instrument

- **Introduction**

  Dear [name],

  We are conducting a short survey among our supporters to plan our electoral campaign. Your participation helps us optimally use our campaign resources. We will treat your answers confidentially. The survey only takes 5 minutes (10 questions).

  Thank you very much for your help!

- **Gender**

  What is your gender?

- **Age**

  How old are you?

- **Party member**

  Are you a member of [own] party?

- **Years of party membership** (asked if respondent is a member)

  For how many years have you been a member of [own] party?

- **Canvassing workshop**

  Have you ever participated in a canvassing training workshop?

- **Canvassing experience**

  Do you have any experience in canvassing in previous electoral campaigns?

- **Prior belief**

  Think of 100 typical [competitor name] party members.

  What do you think: How many of these 100 [competitor name] party members plan to go canvassing during this electoral campaign?

- **Treatment text** (randomly assigned)

  You said X of 100 [competitor name] party members.

  According to a survey of [competitor name] party members, 56 of 100 [competitor name] party members plan to go canvassing during this electoral campaign.

- **Posterior belief**

  What do you think: How many of these 100 [competitor] party members will **actually** go canvassing during this electoral campaign?

- **Participation decision**

  Do you plan to go canvassing during this electoral campaign?

- **Effort decision** (asked if participation decision is 'yes')

  On how many days do you plan to go canvassing during this electoral campaign?

- **Debrief**

  Now let's go! And don't forget to download the [party]-application. Available here for iOS and Android.

  With the [party]-application you can actively participate in our electoral campaign and keep up to date with the campaign progress. Also, the application is fun!