

Political Activists as Free-Riders: Evidence from a Natural Field Experiment*

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Abstract

How does a citizen’s decision to participate in political activism depend on the participation of others? We examine this core question of collective action in a natural field experiment in collaboration with a major European party during a recent national election. In a seemingly unrelated party survey, we randomly assign canvassers to true information about the canvassing intentions of their peers. Using survey evidence and behavioral data from the party’s smartphone canvassing application, we find that treated canvassers significantly reduce both their canvassing intentions and behavior when learning that their peers participate more in canvassing than previously believed. These treatment effects are particularly large for supporters who have weaker social ties to the party, and for supporters with higher career concerns within the party. The evidence implies that effort choices of political activists are, on average, strategic substitutes. However, social ties to other activists can act as a force for strategic complementarity.

Keywords: Political activism, natural field experiment, strategic behavior, beliefs

JEL Classification: D8, P16

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1 Introduction

Democracies rely on the efforts of political activists who participate in political campaigns. In the pursuit of improving collective outcomes, however, the individual action of an activist is unlikely to accomplish change. Instead, the impact of political activists hinges on the joint effort of the group, creating a situation of strategic interdependence: the effort of an activist might depend on the effort of her peers. Such strategic interdependence of individuals' actions is at the core of the collective action problem of political activism (Hardin, 2015; Olson, 1965). This paper presents a natural field experiment to investigate how the effort of a political activist depends on her belief about the participation of others.

In canonical models, political activism is viewed as a public goods game with incentives to free-ride (Olson, 1965): activists are motivated instrumentally, trading off private benefits against private costs of contributing. This class of models postulates that political activists reduce their effort when fellow activists contribute more to the public good. Or, put differently, the effort choices of activists are strategic substitutes.

In contrast, a large literature argues that participation in collective action is not mainly driven by instrumental concerns but instead by social motives leading to conditional cooperation (Falk and Fischbacher, 2006; Ostrom, 2000; Uhlener, 1989). If such motives outweigh instrumental considerations, activists augment their effort in response to an increase in effort by their peers. Hence, activists' effort choices will exhibit strategic complementarity. Understanding the strategic nature of political activism is crucial to the refinement of the theoretical assumptions of models of collective action.

This paper presents the results of a natural field experiment to causally examine the strategic nature of political activism. In cooperation with a major political party in a Western European country, we implemented a pre-registered field experiment in the context of a large door-to-door canvassing campaign in the run-up to a nationwide general election. We examine whether and how party supporters' canvassing efforts depend on their beliefs about the canvassing efforts of their fellow party supporters. We focus on

canvassing as it is an important form of political activism which directly influences political outcomes (Pons, 2018) and requires substantial time commitments from the activists.

Identifying the causal link between beliefs and behavior from correlational data faces the common challenges of causal inference. First, canvassers' effort choices might directly affect their beliefs, thereby giving rise to reverse causality. A concern in this context relates to motivated beliefs (Di Tella et al., 2015). For instance, canvassers might exaggerate the participation of others to exculpate their own lack of effort. Second, active canvassers might hold systematically different beliefs, potentially inducing omitted variable bias. For instance, party supporters who strongly believe in their party's goals might exert a high canvassing effort, but also overestimate the effort of their peers. In correlational data, these confounds could spuriously suggest either strategic substitutability or complementarity.

Our experimental strategy circumvents these confounds by exogenously manipulating beliefs in a natural field setting. Our design proceeds as follows. We use an unobtrusive survey distributed by the party via email eight weeks before the election with the stated purpose of gathering information to organize the campaign. In this survey, we first measure party supporters' ex-ante beliefs about the door-to-door canvassing intentions of their fellow party supporters. We then exogenously shift these beliefs in a treatment group by providing true information collected through a different survey conducted one month prior to the experiment. Supporters in a control group receive no such information. Subsequently, we elicit respondents' post-treatment beliefs about the actual canvassing turnout of their fellow party supporters. Finally, we elicit respondents' intention to go canvassing. After the survey, we collect unique, unobtrusive real-time data on canvassing behavior through a novel canvassing smartphone application in which door-to-door canvassers register the addresses they visit. To preserve the natural field setting we ensured that participants are at no point aware of their participation in an experiment.

We present four key results on the form, strength, and heterogeneity in the strategic interdependence of political activists' effort choices. First, on average, political activists'

intentions follow the predictions of a public goods game with free-riding incentives: party supporters who learn that their peers plan to exert more effort than they previously expected significantly lower their intentions to participate in the party's campaign. The response is concentrated along the intensive margin. Supporters plan to canvass 1.10 days ($s.e. = 0.36$) less relative to a control mean of 4.03 days.

Second, we demonstrate that the reduction in canvassing intentions translates into a reduction in actual canvassing behavior. Using real-time canvassing data collected through the party's smartphone application, we estimate a reduction of 14.39 ($s.e. = 7.38$) canvassed doors, which is equivalent to a reduction of 38% relative to the control group mean of 38.35. Furthermore, we find a statistically significant reduction of 0.093 ($s.e. = 0.047$) standard deviations in a pre-specified index combining canvassing intentions and behavior. Our results thus imply that political activists' behavior exhibits strategic substitutability *on average*.

Who drives these treatment effects? The substantial heterogeneity in our sample allows us to investigate the underlying drivers of our treatment effects. Our third finding reveals that the effects are driven by party supporters with weaker social ties to the party (as proxied by prior canvassing experience, whether the respondent is a party member, and party membership duration). On the contrary, party supporters with strong ties do not exhibit a systematic pattern of strategic substitutability. Hence, these results highlight that social motives and connectedness can counterbalance free-rider incentives and act as a force for strategic complementarity.

Fourth, we demonstrate that the treatment effects are particularly large for party supporters with higher career concerns within the party and, thus, more concerns about signaling their commitment to the party. This finding is consistent with the predictions of models of signaling, where the marginal value of signaling decreases as others contribute more, as long as the fraction of individuals contributing is sufficiently low (Bénabou and Tirole, 2006).

Our study contributes to a growing body of literature investigating the motivation and behavior of political activists such as party supporters (Perez-Truglia and Cruces,

2017) and protesters (Acemoglu et al., 2017; Cantoni et al., 2016, 2018; Enikolopov et al., 2016, 2017; González, 2018; Madestam et al., 2013; Manacorda and Tesei, 2016; Passarelli and Tabellini, 2017). Closest to our paper are Cantoni et al. (2018), who study protest participation in the context of the Hong Kong democracy movement. Their important study finds that beliefs about the turnout decision of protesters causally affect people's decision to participate in a protest. In line with our results, their findings provide evidence on strategic substitutability using self-reported protest participation. However, relative to their study and the existing literature, our setting and findings differ in several important ways.

First, our experimental data is distinct in two main respects: we draw on a unique combination of survey and behavioral outcome data collected through a smartphone application. This feature of the data allows us to study treatment effects on both self-stated intentions and actual behavior. Moreover, we provide evidence from a natural field experiment on behalf of the party, in which participants are not aware of their participation in an experiment. This feature eliminates concerns about experimenter demand effects (de Quidt et al., 2018) and selection into the study, which commonly raises concerns about generalizability in non-natural field experiments (Harrison and List, 2004).

Second, in contrast to samples used in the previous literature, we leverage a heterogeneous sample of party supporters of all ages and with diverse backgrounds. The heterogeneity in our sample allows us to shed light on underlying drivers and mechanisms of our treatment effects. In particular, the heterogeneity in our data provides important evidence that strategic substitutability is most pronounced for party supporters with social ties to the party and those with higher career concerns.

Third, we study participation in a political campaign in a well-functioning democracy compared to the turnout to protests which previous literature has focused on. Compared to canvassing, protests may have different elements that will tend toward strategic substitutability: for example, the costs of turning out to a protest may increase in the perceived size of the protest due to an increased likelihood of a protest crackdown. This in turn makes the question of whether effort choices are strategic complements or substi-

tutes conceptually distinct in the setting of canvassing. In addition, as we investigate the participation in a two month-long campaign compared to the turnout to a single protest, our setting also allows us to study responses along the intensive margin and dynamic effects over time. Importantly, in contrast to Cantoni et al. (2018), we do not find significant treatment effects along the extensive margin. Instead, supporters canvass on fewer days without completely abstaining from canvassing, thus reacting along the intensive margin.

We also contribute to the broader empirical literature examining whether and how beliefs affect political behavior (Cruz et al., 2015; Gerber et al., 2017; Kendall et al., 2014). While previous studies have focused on voting (Bursztyn et al., 2017; DellaVigna et al., 2017; Gerber et al., 2011; Green et al., 2013), we examine canvassing which has previously been understudied.

Our findings also inform the theoretical literature investigating political behavior in democratic systems (Coate and Conlin, 2004; Downs, 1957; Feddersen and Sandroni, 2006; Palmfrey and Rosenthal, 1984). Our results provide evidence in line with the classical free-rider assumption in models of collective action (Olson, 1965). However, the systematic heterogeneity in the responsiveness to our treatment underscores that this assumption does not apply uniformly across the population. Instead, our findings highlight that theoretical models of political behavior have to account for heterogeneity in agents' motivation. This may be accomplished by introducing different types of agents, or by considering multiple motives simultaneously, both instrumental and social, as well as their interaction, as recently conceptualized by Jia and Persson (2018).

In this context, our results also highlight which assumptions on activists' motivation carry empirical relevance. In particular, our finding that stronger social ties within the party dampen strategic substitutability emphasizes the importance of social motives in counterbalancing free-rider incentives.¹ Furthermore, we also provide novel evidence on an additional form of party supporters' instrumental motivation: extrinsic career con-

¹This finding might also be seen as empirical support for the Uhlaner (1989) concept of relational goods, which are enjoyed only through the consumption of other group members by for instance enhancing a common identity.

cerns within the party. Besides its relevance for the theoretical modeling of activists' motivation, this finding also holds practical relevance for party officials for the organization of political campaigns and the design of incentive schemes within the party.

Finally, we also contribute to the experimental literature on how strategic interaction affects public good provision in natural field settings (Fehr and Gächter, 2000a; Gallus, 2017). While our experiment concerns public goods at the nation-level, most field experiments on public good provision are in the domain of charitable giving (e.g. Frey and Meier, 2004; Shang and Croson, 2009) or the contribution to online communities (Chen et al., 2010). In contrast to our results, these field experiments tend to find patterns of strategic complementarity.

This paper proceeds as follows: Section 2 provides a simple conceptual framework. Section 3 describes the setting and the experimental design. Section 4 characterizes pre-treatment beliefs about peer effort and belief updating in response to the treatment. Section 5 presents the main results on the impact of beliefs about peer effort on canvassing intentions and effort, followed by a conclusion in section 6.

2 Conceptual framework

Assumptions: To motivate our empirical design and guide our analysis, we present a simple partial-equilibrium model of an individual's decision to participate in canvassing. A canvasser's utility depends on her own canvassing effort, d_i , and her beliefs about fellow supporters' canvassing efforts, d_{-i} , according to

$$u_i(d_i) = (1 - \alpha_i)g(d_i, d_{-i}) + \alpha_i h(d_i, d_{-i}) - c_i(d_i) - \tilde{c}_i \cdot \mathbb{1}(d_i > 0). \quad (1)$$

In this equation, $g(d_i, d_{-i})$ denotes an activist's instrumental utility from canvassing, while $h(d_i, d_{-i})$ represents the social utility gained from canvassing. Both $g(d_i, d_{-i})$ and $h(d_i, d_{-i})$ are assumed to be continuous and twice differentiable. Critically, both terms depend on own effort d_i but also on believed peer efforts d_{-i} . Instrumental and social

utility have individual-specific relative weights $1 - \alpha_i$ and α_i , respectively.

Costs of canvassing are captured by $c_i(d_i)$ with $c', c'' > 0$ and $c'(0) = 0$, and individual-specific fixed costs $\tilde{c}_i \sim F$. We assume that all idiosyncratic properties are summarized by type $i \in I$, distributed according to $\Phi \perp F$. Canvasser i chooses canvassing effort, d_i , to maximize her utility u_i given the reservation utility from not participating in canvassing $(1 - \alpha_i)g(0, d_{-i})$.

We further clarify the properties of instrumental utility $g(d_i, d_{-i})$ and social utility $h(d_i, d_{-i})$. Instrumental utility $g(d_i, d_{-i})$ comprises two motives: first, the value of votes obtained through canvassed doors and, second, extrinsic career prospects within the party. In other words, activists may be motivated to participate in canvassing to signal their commitment to the party and thereby increase their chances of getting promoted. We thus assume that $\frac{\partial g(d_i, d_{-i})}{\partial d_i} > 0$. Critically, we also posit that the instrumental returns to canvassing are decreasing in peer effort (i.e. $\frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}} < 0$). In the context of our experiment, this assumption is likely to hold for two reasons. First, instrumental returns to canvassing are decreasing in peer effort if marginal benefits of additional votes or the returns to canvassing are decreasing, an assumption which is plausible in our setting. The party encouraged local canvassers to target the most promising areas first, which implies that the expected returns to additional canvassing are likely to decrease in the total canvassing activity.² Second, following the logic of models of signaling (Bénabou and Tirole, 2006), higher participation of others is likely to decrease the extrinsic signaling value of canvassing to indicate commitment to the party, which leads to an additional reduction in the instrumental return to d_i .³

The term $h(d_i, d_{-i})$ represents the social utility gained from canvassing for which we assume $\frac{\partial h(d_i, d_{-i})}{\partial d_i} \geq 0$. Most generally, this term captures the quality of canvassing as a relational good (Uhlaner, 1989) that is enjoyed only through the consumption of others.

²In addition, the party only gains little political power from winning votes beyond a threshold that ensures that it forms part of the government.

³In terms of the model developed by Bénabou and Tirole (2006), this holds for the lower tail of the distribution of prior beliefs about the participation of others where the 'virtue' channel dominates. This assumption seems suitable for this analysis as we mostly focus on individuals with relatively low beliefs about the participation of others.

In line with a large literature on conditional cooperation in collective action (Ostrom, 2000), we hence assume that social returns to canvassing are increasing in peer effort, i.e. $\frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}} > 0$. A specific psychological foundation for this assumption is provided by theories of reciprocity (Falk and Fischbacher, 2006; Fehr and Gächter, 2000b) in which individuals receive utility from rewarding kind actions of others.

Intensive margin responses: We first analyze intensive margin responses due to a change in beliefs about peer canvassing effort d_{-i} . The model yields that the strategic interaction between canvassers is determined by the relative importance of changes in the instrumental and social returns to canvassing.

- Effort choices will be **strategic complements** ($\frac{\partial d_i^*}{\partial d_{-i}} > 0$) iff $\alpha_i \frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}} > -(1 - \alpha_i) \frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}}$, namely iff changes in social returns dominate changes in instrumental returns.
- Effort choices will be **strategic substitutes** ($\frac{\partial d_i^*}{\partial d_{-i}} < 0$) iff $-(1 - \alpha_i) \frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}} > \alpha_i \frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}}$, namely iff changes in instrumental returns dominate changes in social returns.

Proofs of these results can be found in Appendix section A.

Heterogeneity by strength of instrumental and social motives: How do the patterns of strategic interaction vary with the relative importance of social motives α_i ? Intuitively, we show in Appendix section A that individuals who put a sufficiently high weight on instrumental utility will exhibit strategic substitutability in their effort choices, whereas individuals who put a sufficiently high weight on social motives will exhibit strategic complementarity in their effort choices.

In the context of our experiment, we expect stronger social connectedness to the party to trigger a higher weight on social motives α_i , as stronger social connectedness plausibly increases the reciprocity to other party members and enhances identification with the party. We test this prediction empirically by estimating how the treatment effects vary with proxies such as having prior canvassing experience, being a member of the party,

and the duration of membership. On the other hand, we expect individuals with stronger career concerns to give higher priority to extrinsic instrumental motives, and conversely to exhibit a lower relative weight α_i .

Extensive margin responses: Finally, we consider how extensive margin responses depend on individuals' beliefs about their peers canvassing effort. Note that an individual i will turn out canvassing if her cost of canvassing \tilde{c}_i is lower than a cutoff value \tilde{c}_i^* . Hence, the fraction of individuals of type i deciding to participate in canvassing is equal to $F(\tilde{c}_i^*)$. We show in Appendix section A that the marginal extensive margin response to an increase in d_{-i} is equal to

$$\left((1 - \alpha_i) \left(\frac{\partial g(d_i^*, d_{-i})}{\partial d_{-i}} - \frac{\partial g(0, d_{-i})}{\partial d_{-i}} \right) + \alpha_i \frac{\partial h(d_i^*, d_{-i})}{\partial d_{-i}} \right) \cdot f(\tilde{c}_i^*),$$

where d_i^* is the optimal canvassing effort conditional on exerting positive canvassing effort. Note that the sign of the effect depends on the relative strength of changes in instrumental utility $\left(\frac{\partial g(d_i^*, d_{-i})}{\partial d_{-i}} - \frac{\partial g(0, d_{-i})}{\partial d_{-i}} \right)$ and social utility $\left(\frac{\partial h(d_i^*, d_{-i})}{\partial d_{-i}} \right)$. Most importantly, however, the effect size critically depends on the mass of marginal individuals $f(\tilde{c}_i^*)$. If $f(\tilde{c}_i^*)$ is low (high), the effect size on the extensive margin will be comparatively low (high) relative to the intensive margin. Differences in the effect sizes between the extensive and intensive margin may hence be interpreted as indicators of the mass of marginal individuals.

3 Experimental Design

3.1 Design and Sample

Setting: Our field experiment took place in the run-up to a recent general election in a Western European country. The experiment was implemented in collaboration with a major political party to study party supporters' motivation and actual participation in the party's door-to-door canvassing campaign. The analysis was pre-registered at the AEA

RCT registry before the start of the data collection. The experimental manipulation was administered in an online pre-campaign survey sent out on behalf of the party roughly eight weeks before the election. After the intervention, we tracked party supporters' real canvassing efforts throughout the campaign until the election.

The party with which we cooperated strongly promoted canvassing as a campaigning tool through internal communication channels. All canvassing volunteers were instructed to record every canvassed door in a novel smartphone application as a way to help the party organize this and future campaigns. The data from the application provide unique behavioral outcomes on actual, real-time canvassing efforts.

While the overall level of canvassing activity was higher than in previous elections, there was still substantial potential to increase activity levels. Nationally, volunteers of the party reached out to 1.65% of all households. At the constituency level, the fraction of households canvassed ranged between 0 and 25% with a median of 0.5% and a 90th percentile of 4.5%. These low absolute levels of canvassing in most places imply that there was scope for volunteers to increase their level of canvassing activity even though that could imply going to less promising areas and thus lower returns to canvassing activity.

Sampling and Procedures: Our original sample comprises all party supporters who had signed up to the party's campaign email list about eight weeks before the election. At the beginning of the electoral campaign, we contacted these supporters with an email invitation on behalf of the party. The email asked supporters to participate in the survey to help organize the campaign. The invitation email was designed by the party to preserve the natural environment and ensure that participants would not be aware of being part of an experiment. A reminder email was sent ten days later. In total 1,411 party supporters responded to the online survey for this experiment.⁴ Random assignment and

⁴We simultaneously conducted a second experiment which is pre-registered in the same pre-analysis plan used for this paper. Supporters responding to the invite were randomly allocated between the experiment described in this paper and the experiment described in Hensel et al. (2018) which studies how beliefs about the effort choices of members of the main competing political party affect activists' effort choices.

experimental manipulation took place within the online survey.⁵ The natural field setting eliminates concerns about experimenter demand effects, which are a common challenge in studies investigating the role of beliefs and expectations. It also mitigates concerns about selection into the study, which threatens the external validity in non-natural field experiments (Harrison and List, 2004).

Measuring and Manipulating Beliefs: We designed the experiment to provide causal evidence on how party supporters' motivation and actual canvassing effort depend on their beliefs about the efforts of their peers.

The experimental design is illustrated in Figure 1. In a first step, we elicit participants' pre-treatment beliefs about the share of party members who plan to go canvassing. Then, half of all respondents are randomly assigned to receive information about the canvassing plans of fellow party members (treatment group), whereas the remaining half receives no information (control group). More specifically, participants in the treatment group are truthfully informed that 37% of party members in a previous survey had stated an intention to go canvassing.⁶ After the experimental manipulation, all respondents are asked to estimate the share of members who will actually go canvassing.⁷ The elicitation of participants' post-treatment beliefs allows us to check whether the information provision successfully shifts beliefs.

Outcome Measures: We study the canvassing effort of party supporters in the campaign by combining both survey and behavioral outcome data. We use two pre-specified self-reported measures of canvassing intentions that are collected after the treatment administration: First, we measure whether a respondent intends to do any canvassing in the campaign. This allows us to shed light on movement along the extensive margin.

⁵We include all individuals who saw the treatment screen in our sample even when they did not complete the full survey as pre-specified in the pre-analysis plan. This leads to small variations in sample size across survey-based and behavioral outcomes.

⁶We collected this data in a separate survey amongst other party members three weeks before the experiment.

⁷We did not incentivize the belief elicitation to preserve the natural context of the survey. The organizers of the campaign were concerned that incentives would be perceived as very unusual by their supporters.

Second, we elicit respondents' intended number of days of participation, enabling us to analyze responsiveness to the treatment along the intensive margin.⁸

We then assess whether changes in canvassing intentions translate into changes in canvassing behavior. We draw on unique behavioral outcome data from the smart-phone application distributed by the party. The application allows us to assess three pre-specified behavioral outcomes: first, an indicator for whether a supporter knocks on any doors; second, the number of doors a supporter knocks on;⁹ and third, the number of days a supporter goes canvassing.¹⁰

3.2 Descriptives and Balance

Panel A of Table 1 describes the sample characteristics elicited in the survey. 24% of supporters are women, and the average age is 41 years. 83% of supporters are party members with an average membership duration of 12 years. Besides basic socio-demographic information, the survey also inquires about supporters' prior canvassing experience. 38% of participants had helped in a past campaign.

Regarding our outcome variables, 49% of supporters intend to participate in door-to-door canvassing with an average of 3.85 intended days. Turning to behavioral outcomes from the app, we observe much lower actual canvassing activity relative to stated canvassing intentions: 12% of party supporters in our sample actually participate in the campaign. The respondents canvass on average 0.59 days and knock on 29 doors. The unique link between the survey and the behavioral outcome data from the natural field setting also allows us to study how intentions and actual canvassing behavior are related. We find a sizable positive correlation between intended days and the actual number of days of canvassing ($\rho = 0.28$, visualized in Figure A1). Similarly, we find that people's intention to do any canvassing is significantly related to whether they actually canvass ($\rho = 0.33$).

⁸The intended number of days for respondents who do not plan to canvass is coded as zero days.

⁹We pre-specified to winsorize this variable at the 99 percentile to deal with outliers.

¹⁰Individuals who do not appear in the application data are coded as not having canvassed.

These sizable and statistically significant correlations indicate that intentions are predictive of subsequent actual behavior. Given that these correlations do not equal one, however, highlights that self-stated intentions and actual behavior of activists cannot be equated. This feature underscores the necessity of collecting behavioral outcomes in addition self-stated intentions in order to examine the strategic behavior of political activists.

Finally, in terms of balance, we do not observe significant differences between the treatment and control group for any of the covariates (Table A1). We regress the treatment indicator on all covariates to test for joint significance. The p-value of this joint F-test is 0.59 indicating that the randomization produces two highly comparable groups.

4 Belief Updating

Before turning to the analysis of treatment effects on canvassing outcomes, we test for the successful manipulation of beliefs about peer canvassing effort.

Pre-treatment Beliefs: Figure 2 plots the distribution of pre-treatment beliefs about the percentage of party members who intend to go canvassing. The vertical red line corresponds to the treatment information which indicates that 37% of party members intend to go canvassing. We observe that the distribution is highly right skewed with a median belief of 10% of party members planning to go canvassing. Relative to the treatment information, 82% of participants underestimate their peers' canvassing intentions.

Belief Updating: The key qualification of our experimental design is that participants update their beliefs after receiving the treatment information. In particular, we expect underestimators to increase their post-treatment belief about the fraction of fellow party members who actually go canvassing. Vice versa, we expect overestimators to decrease their post-treatment beliefs.

Figure 3 shows the joint distribution of pre- and post-treatment beliefs split by underestimators (red markers) and overestimators (blue markers), where each marker rep-

resents one participant. Darker colored triangles indicate participants in the treatment group, while lighter colored circles represent participants in the control group. First, for the control group, we observe that pre- and post treatment beliefs are highly correlated with a correlation of 0.91. More importantly, however, in the treatment group, underestimators (to the left of the red line) hold a statistically significant, five percentage points higher average beliefs after receiving the treatment information. The opposite applies for overestimators (to the right of the red line). We conclude that the information provision successfully shifted participants’ beliefs about the canvassing effort of their peers.

5 Results

5.1 Empirical Specification

Do these exogenous changes in beliefs affect party supporters’ motivation and actual behavior in the campaign? We tackle this question in this section.

In our analysis we focus on participants who underestimate the share of fellow party members who plan to go canvassing. As only 18 percent of our respondents overestimate this statistic, we lack the statistical power to estimate precisely measured treatment effects for overestimators.¹¹ We estimate the following specification using ordinary least squares:

$$Y_i = \beta_0 + \beta_1 T_i + \zeta^T \mathbf{X}_i + \varepsilon_i \quad (2)$$

where Y_i is the outcome variable of interest. T_i is a dummy variable taking a value of one for people who receive the treatment information and zero otherwise. \mathbf{X}_i is a set of pre-specified control variables: party membership, number of years of party membership, age, sex, whether a participant has already participated in a canvassing training,

¹¹Panel B and C of Table 1 provide descriptive statistics for under- and overestimators, respectively. We report the results for overestimators in Online Appendix Tables A12 to A20.

whether a participant has already downloaded the online application, whether a participant has participated in canvassing before this federal election, and whether a participant has participated in canvassing for this federal election.¹² To account for multiple comparisons, we also examine the effects on a pre-specified index as a joint measure of all five self-reported survey measures and behavioral outcomes jointly.¹³ The key coefficient is β_1 which captures the strategic interaction between one's own and peer effort. As we focus on underestimators, if $\beta_1 < 0$, own and peer effort exhibit strategic substitutability, if $\beta_1 > 0$ they exhibit strategic complementarity.

5.2 Main Results

Table 2 presents the main results. Participants who are informed that fellow party members devote more effort than previously thought, on average, reduce their willingness to participate in the party's campaign. This effect prevails on the intensive margin: participants intend to canvass 1.1 days (*s.e.* = 0.36) less after receiving the treatment information, which is equivalent to a reduction of 27% relative to the control group mean of 4 days. There is, however, no significant extensive margin effect on the dummy for the intention to engage in any canvassing, with a point estimate close to zero (0.002, *s.e.* = 0.026). Hence, party supporters intend to canvass less without abstaining from canvassing altogether.

Does lower *intended* canvassing translate into lower *actual* canvassing? At the intensive margin we again find a significant reduction of 14.39 canvassed doors (*s.e.* = 7.8). This is equivalent to a 38% reduction relative to the control group mean of 38.35 doors. Similarly, the point estimate on the impact on actual days canvassed indicates a reduction of 0.16 canvassed days (*s.e.* = 0.16), corresponding to a sizable, yet not statistically

¹²Excluding control variables leads to similar results (Online Appendix Tables A21 to A29).

¹³The index takes into account (i) an indicator for whether a participant plans to go canvassing, (ii) the number of days that a participant plans to go canvassing, (iii) an indicator for whether a participant knocks on any door, (iv) the number of doors that a participant knocks on, and (v) the number of days a participant goes canvassing. We construct the index by first standardizing each outcome using the control group mean and standard deviation, then calculating the total of the standardized variables, and finally re-standardizing the sum to have mean zero and standard deviation of one.

significant 23% reduction relative to the control group mean.¹⁴ In line with the results on intentions, we again do not find an extensive margin effect.¹⁵ The non-response on the extensive margin squares with the findings by Perez-Truglia and Cruces (2017) who examine interdependency in monetary campaign contributions. They find that party supporters contribute lower amounts at the intensive margin if they are informed that more of their peers contribute without changing behavior at the extensive margin.

Finally, we investigate the impact on the pre-specified index of all five outcomes capturing intentions and actual behavior jointly. We observe a decrease of 0.093 (*s.e.* = 0.047) standard deviations in this summary measure of canvassing intentions and behavior.¹⁶ Taken together, these results indicate that, on average, increases in supporters' beliefs about their peers' efforts decrease both canvassing intentions and behavior. As such, our findings provide evidence on strategic substitutability in political activists' effort choices.

Treatment Effects over Time: Did our treatment have a lasting impact or did we only temporarily affect behavior and intentions? One might suspect that the treatment effects are short-lived as treated individuals forget the provided information. In this case, the treatment effects should be driven by changes in behavior shortly after the treatment is administered. To investigate this issue systematically, panel (a) of Figure 4 shows the average number of doors knocked on separately for the treatment and control group, week-by-week for the 8-week period in the run-up to the election. Overall, the canvassing activity strongly increases as the election comes closer. However, a clear divergence between the control and treatment groups emerges, most noticeable in weeks seven and eight when the overall canvassing activity peaks.

Panel (b) of Figure 4 shows treatment effects conditional on the pre-specified covariates obtained by estimating equation (2) separately for each week after the survey. As already suggested by the raw data, we observe a large and highly significant treatment

¹⁴To show that our treatment effects are not driven by outliers, Figure A2 presents cumulative distribution functions of intended days of canvassing, actual days canvassing, and doors knocked on for treatment and control group.

¹⁵Similarly, we do not find a significant effect on application download (Online Appendix Table A2), consistent with our findings on the extensive margin.

¹⁶All results are also significant when employing randomization inference (see Appendix Table A3).

effect in week eight after the survey at the time where overall canvassing activity peaks and we possess the statistical power to detect the treatment effects. The analogous pattern is also present when we investigate the number of days canvassed in panels (c) and (d) of Figure 4. The last two columns of Table 2 show the results of our main regression analysis on days canvassed and doors knocked on in week seven and eight after the treatment. The estimates show statistically significant effect sizes relative to the control mean of roughly 50%.

The combination of an instantaneous impact on canvassing intentions with a long-term impact on behavioral outcomes indicates that our information provision persistently changed beliefs about fellow party members' participation in the party's campaign and produced long-lasting changes in canvassing behavior.

5.3 Heterogeneity in Treatment Effects

Heterogeneity by Social Ties to the Party: Who drives these treatment effects? In Section 2, we outlined a simple conceptual framework of canvassing effort. The model posits that individuals who put a relatively lower weight on social as compared to instrumental motives will exhibit a stronger pattern of strategic substitutability. Vice versa, for individuals with stronger social motives, the pattern of strategic substitutability should be weaker.

To test for heterogeneity by social motives, we use a variety of proxies for the strength of the social connection to the party. In the pre-analysis plan we had pre-specified analyzing heterogeneity by participants' (i) prior canvassing experience, (ii) whether they are a party member, and (iii) their years of party membership. To keep the analysis as parsimonious as possible, we first employ a simple principal component analysis (PCA) of these three variables to study heterogeneous treatment effects using the standardized first principle component of the three variables. Intuitively, we use the first principle component as an index capturing the strength of social ties to the party.

Before turning to the heterogeneity analysis, we validate this index as a well-suited measure capturing party supporters' social connectedness and social motives. We do so

by investigating the predictive power of this index for three outcomes: (i) the number of party members a supporter knows personally, (ii) a supporter's identification with the party, and (iii) a supporter's identification with the party platform (Table A4). Using data from a post-election survey administered to a different sample of the same population of supporters, we find that supporters scoring above the median on the index measure know 23 ($p < 0.001$) more party members than supporters below the median. Furthermore, they exhibit a 0.27 ($p < 0.001$) standard deviations higher identification with the party, and a 0.23 ($p < 0.001$) standard deviations higher identification with the party platform. Based on these results, we use the first principle component as a measure of party supporters' social connectedness and social motives in the following analysis.

In line with our hypothesis, supporters with weaker connections to the party exhibit a larger negative treatment effect relative to supporters with stronger connections (Table 3). The treatment effect heterogeneity is of statistical and economic significance for both intentions and behavior: treated supporters with one-standard deviation stronger connections to the party exhibit a reduction of the treatment effect on intended days of 0.76 ($s.e. = 0.37$). The attenuation of the treatment effect on canvassing intentions translates into an attenuated treatment effect on canvassing behavior. Treated supporters with one standard deviation weaker connections to the party knock on 16.6 ($s.e. = 7.2$) fewer doors. The complementing treatment effect heterogeneity for behavioral outcomes over time is illustrated by Figure 5. Finally, in terms of the summary index measuring canvassing intentions and behavior jointly, we find that treated supporters with one-standard deviation stronger connections to the party display a 0.084 ($s.e. = 0.045$) standard deviation smaller decrease in canvassing. These results suggest that social connectedness and social motives can counterbalance strategic substitutability and act as a force for strategic complementarity in the effort choices of political activists.¹⁷

We also examine heterogeneous responses for each of the variables used in the PCA separately which further corroborates that supporters with weaker social ties to the party

¹⁷An alternative mechanism might be that supporters with weaker social connections to the party update their post-treatment beliefs more strongly. However, we do not find any differential treatment effects on the post-treatment belief (column 1, Table 3).

drive our treatment effects: treatment effects are driven by supporters without prior canvassing experience (Table A5), non-party members (Table A6) and for newer members (including non-members) (Table A7).

Heterogeneity by Career Concerns: Turning from social to instrumental motives, we next examine whether party supporters driven by instrumental motives are responsible for our treatment effects as hypothesized in our conceptual framework. In this regard, we analyze heterogeneous treatment effects by individuals' career concerns within the party as a specific form of extrinsic, instrumental motivation. As we could not ask respondents directly about their career concerns, we use a post-LASSO technique to predict career concerns based on data on career concerns from the post-election survey administered to the same population of supporters, but excluding individuals who also participated in the main experiment. We define individuals as having high career concerns if they answer "It is possible" to at least one of the following questions: "Can you imagine yourself taking on a political position within the party?" and "Can you imagine yourself running for office for this party?".¹⁸ Based on the survey responses, we predict values of career concerns for participants in our experiment using a post-LASSO algorithm (Belloni and Chernozhukov, 2013). This procedure involves three steps. First, we use a LASSO algorithm to select the subset of best predictors among a large set of predetermined variables and all their pairwise interactions. Next, we perform an OLS regression of the dependent variable on the selected variables. We then use the obtained OLS coefficients to predict social connections for participants in our experiment based on their characteristics (see Table A8). We then standardize the variable to have mean zero and standard deviation one to facilitate interpretation. Using the standardized measure, we investigate the heterogeneity by predicted career concerns.

Table 4 provides evidence that strategic substitutability is stronger for respondents with a higher degree of predicted career concerns. Treated supporters with one-standard deviation higher career concerns display a 0.097 standard deviation (*s.e.* = 0.045) larger

¹⁸The answer options were "No", "It is possible", and "I am already doing this".

decrease in canvassing as measured by the summary index and knock on 18.2 fewer doors (*s.e.* = 6.98). The complementing treatment effect heterogeneity over time by career concerns is illustrated in Figure 6. The large negative treatment effects for supporters with higher career concerns is consistent with dampened instrumental signaling returns: higher participation of others reduces the signaling value of exerting effort to indicate commitment to the party.¹⁹

In sum, our results are consistent with the prediction that the overall treatment effects are driven by individuals with higher instrumental motivation and weaker social ties to the party. There is substantial heterogeneity in the extent of strategic substitutability even among supporters of the same party. Depending on the relative strength of instrumental and social motives, the degree of strategic substitutability and potentially even the qualitative nature of the strategic interaction vary between individuals.

5.4 Spillovers into Alternative Effort Domains

Do party supporters substitute their reduced canvassing effort with increased effort in alternative contribution domains? This question pertains to the cross-substitutability between different forms of political activism. Activists might shift their effort between different contribution domains and activities to maximize their impact. In this case, different forms of political activism exhibit cross-substitutability. Alternatively, activists might be constrained or unwilling to respond with increased effort in alternative activities, indicating that different forms of political activism exhibit no cross-substitutability. To investigate this question, we leverage unique data from the party's application regarding activity on social media. Specifically, we investigate whether respondents who learn that fellow supporters engage in more canvassing become more likely to share news stories pertaining to their party on Facebook through the application.

We find that respondents who learn that fellow supporters engage in more canvass-

¹⁹An alternative mechanism might be that supporters with higher career concerns update their post-treatment beliefs more strongly. However, we do not find any differential treatment effects on the post-treatment belief (column 1, Table 4).

ing than previously believed do not respond with an increase in sharing of party news stories (Table A9). The data indicate that treated supporters show a close-to-zero decrease of 1.1%-points (*s.e.* = 1.4%) in their likelihood to share any news story as well as a decrease of 0.148 (*s.e.* = 0.22) in the average number of news stories shared. This evidence suggests that there is no cross-substitutability between supporters' canvassing behavior and their activity on social media pertaining to the party.

5.5 Interpreting Effect Sizes

IV Estimates: Finally, we assess the quantitative impact of beliefs about the effort of fellow party members on canvassing effort. To answer this question we employ the following instrumental variable specification:

$$\begin{aligned}
 y_i &= \pi_0 + \pi_1 \widehat{\text{PB}}_i + \zeta^T \mathbf{X}_i + \varepsilon_i \\
 \text{PB}_i &= \kappa_0 + \kappa_1 T_i + \tilde{\zeta}^T \mathbf{X}_i + \vartheta_i
 \end{aligned}$$

where PB_i is a respondent's post-treatment belief about the fraction of party members who actually go canvassing and all other variables are defined as before. We instrument the post-treatment belief with the treatment indicator, ensuring that our estimates are solely identified from variation induced by the experimental treatment. Taking this estimate at face value, we obtain the causal quantitative impact of beliefs on respondents' effort choices.

Table 5 presents the results. For the full sample (Panel A) we find that a one percentage point increase in the belief about the fraction of fellow party members who participate in canvassing leads to a decrease in planned days of 0.22 (*s.e.* = 0.077). In addition, we find a decrease of 3 (*s.e.* = 1.6) doors and a 0.02 (*s.e.* = 0.01) standard deviation decrease in the index. Again, the effect sizes are much stronger for party supporters with a weak connection to the party (Panel B) with a decrease of 0.35 (*s.e.* = 0.13) intended

days and 6.03 (*s.e.* = 2.74) doors per one percentage point belief change.²⁰ Similarly, supporters with high career concerns (Panel E) display a high quantitative magnitude of the treatment effect with a decrease of 0.39 (*s.e.* = 0.13) intended days and 7.13 (*s.e.* = 3.21) doors per one percentage point belief change. In contrast, supporters exhibiting a strong connectedness to the party exhibit a much weaker effect size (Panel C) and those with low career concerns (Panel D) show an effect size close to zero.

Comparing OLS with the IV Estimates: Do the IV estimates differ from correlational evidence based on OLS estimation? In Table A10, we present for the control group OLS regressions of the outcome data on the belief about the fraction of fellow party members who participate in canvassing. We find that the IV results stand in contrast to the OLS estimates which suggest moderate complementarity in effort choices. A one percentage point increase in the belief about peer effort is associated with 1.2 (*s.e.* = 0.69) more canvassed doors and a 0.007 (*s.e.* = 0.004) standard-deviation increase in the index.

Using a Hausman-style test for the exogeneity of beliefs about peer effort, we reject exogeneity at the 5% level for intended days, doors, and the index.²¹ The differences in results between the OLS estimates and the IV estimates could be explained by omitted variable bias. For example, individuals who believe that canvassing is particularly effective might be more likely to both canvass and believe that others do the same. This divergent evidence highlights the methodological necessity of exogenous belief manipulation for the isolation of causal effects.

6 Conclusion

How do political activists' effort choices depend on their beliefs about the effort of fellow activists? This paper presents a natural field experiment to provide evidence on the

²⁰We define supporters with a weak or strong connection to the party as those scoring below or above the median of the summary measure of connectedness to the party.

²¹The tests we use are defined as the difference of two Sargan-Hansen statistics: one for the equation without instruments, where the belief about peer effort is not instrumented, and one for the equation where it is instrumented by the treatment. Under the null hypothesis that the belief about peer effort is exogenous, the test statistic is distributed as chi-squared with one degree of freedom.

strategic interdependence of political activists' intentions and behavior, a core question of the collective action problem of political activism. In collaboration with a major political party in a Western European country, we exogenously manipulate party supporters' beliefs about their peers' canvassing effort in a large door-to-door canvassing campaign in the run-up to a nationwide general election. We study how the belief manipulation affects the effort provision in the campaign.

Our findings demonstrate, on average, a pattern of strategic substitutability: political activists lower their effort when learning that fellow party members are more likely to canvass. This result holds for the self-stated willingness to canvass as well as actual canvassing effort measured through a smartphone application. Treatment effects are driven by behavior several weeks after the treatment, underscoring that our intervention had a long-lasting impact beyond the intentions reported right after the treatment. The estimated effect sizes are large (up to 38% of the mean in the control group), suggesting that strategic considerations are quantitatively important in shaping political activists' motivations and behavior.

These findings underscore the empirical relevance of the classical free-rider assumption in models of collective action (Olson, 1965). However, the substantial heterogeneity in responsiveness to our treatment also highlights that this assumption is unlikely to apply uniformly across the population. In particular, while respondents motivated by career concerns are more likely to exhibit strategic substitutability, respondents displaying stronger ties to the party are less likely to exhibit strategic substitutability. These findings highlight that contributions to collective action can be driven by multiple motives, in particular social considerations which can be a force for strategic complementarity (Falk and Fischbacher, 2006; Ostrom, 2000; Uhlener, 1989). Models of collective action may incorporate such heterogeneity in their assumptions for instance by incorporating different types of actors, or considering multiple motives and their interaction simultaneously as in a recently proposed model by Jia and Persson (2018).

Besides the theoretical implications of our results, the evidence also provides practical implications for policy makers and campaign organizers. Anecdotal evidence sug-

gests that party officials and campaign organizers rely on the assumption of strategic complementarity. For instance, our cooperating party tried to motivate its supporters by highlighting high levels of canvassing participation through e-mail notifications like *“Dear supporter, our diligent canvassers have already knocked on over [number anonymized] doors. And every day the number increases! [...] Everybody goes from door to door! Participate as well!”* Our results suggest that such promotion strategies might actually be counterproductive on average. Instead, our findings indicate that instrumental motives, such as career concerns within the party, can be an important driver of party supporters’ participation decisions. Hence, our results might also be informative for party officials in designing effective incentive schemes for the party’s supporters.

References

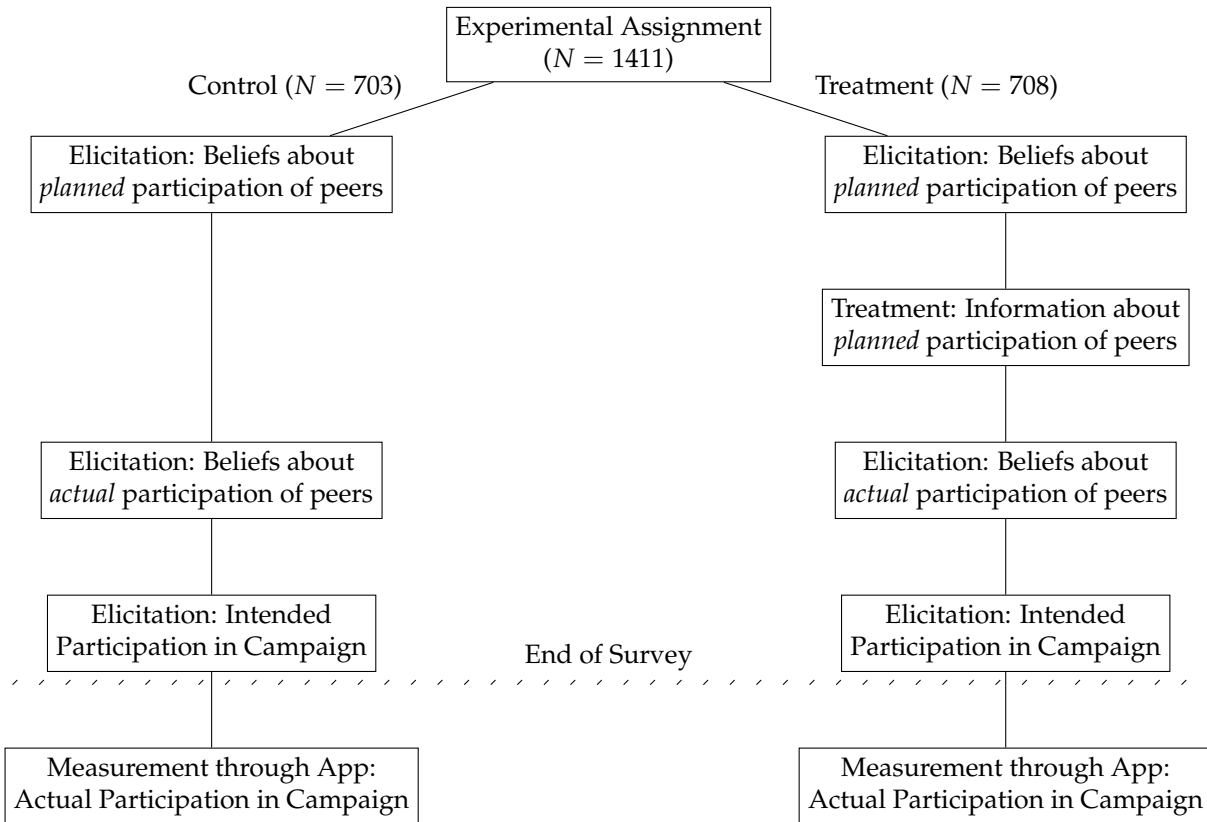
- Acemoglu, Daron, Tarek A Hassan, and Ahmed Tahoun**, “The Power of the Street: Evidence from Egypt’s Arab Spring,” *The Review of Financial Studies*, 2017, 31 (1), 1–42.
- Belloni, Alexandre and Victor Chernozhukov**, “Least Squares After Model Selection in High-Dimensional Sparse Models,” *Bernoulli*, 2013, 19 (2), 521–547.
- Bénabou, Roland and Jean Tirole**, “Incentives and Prosocial Behavior,” *American Economic Review*, December 2006, 96 (5), 1652–1678.
- Bursztyn, Leonardo, Davide Cantoni, Patricia Funk, and Noam Yuchtman**, “Polls, the Press, and Political Participation: The Effects of Anticipated Election Closeness on Voter Turnout,” *NBER Working Paper 23490*, 2017.
- Cantoni, Davide, David Y Yang, Noam Yuchtman, and Y Jane Zhang**, “The Fundamental Determinants of Anti-Authoritarianism,” *Working Paper*, 2016.
- , **David Yang, Noam Yuchtman, and Jane Zhang**, “Protests as Strategic Games: Experimental Evidence from Hong Kong’s Anti-Authoritarian Movement,” *Quarterly Journal of Economics*, forthcoming, 2018.
- Chen, By Yan, F Maxwell Harper, Joseph Konstan, and Sherry Xin Li**, “Social Comparisons and Contributions to Online Communities: A Field Experiment on MovieLens,” *American Economic Review*, 2010, 100 (4), 1358–1398.
- Coate, Stephen and Michael Conlin**, “A Group Rule-Utilitarian Approach to Voter Turnout: Theory and Evidence,” *American Economic Review*, 2004, 94 (5), 1476–1504.
- Cruz, Cesi, Philip Keefer, and Julien Labonne**, “Incumbent Advantage, Voter Information and Vote Buying,” *Working Paper*, 2015.
- de Quidt, Jonathan, Johannes Haushofer, and Christopher Roth**, “Measuring and Bounding Experimenter Demand,” *American Economic Review*, 2018, 108 (11), 3266–3302.
- DellaVigna, Stefano, John A. List, Ulrike Malmendier, and Gautam Rao**, “Voting to Tell Others,” *The Review of Economic Studies*, 2017, 84 (1), 143–181.

- Gerber, Alan S, Daniel P Kessler, and Marc Meredith**, “The Persuasive Effects of Direct Mail: A Regression Discontinuity Based Approach,” *The Journal of Politics*, 2011, 73 (01), 140–155.
- González, Felipe**, “Collective Action in Networks: Evidence from the Chilean Student Movement,” *Working Paper*, 2018.
- Green, Donald P, Mary C McGrath, and Peter M Aronow**, “Field Experiments and the Study of Voter Turnout,” *Journal of Elections, Public Opinion & Parties*, 2013, 23 (1), 27–48.
- Hardin, Russell**, *Collective Action*, Routledge, 2015.
- Harrison, Glenn W and John A List**, “Field Experiments,” *Journal of Economic literature*, 2004, 42 (4), 1009–1055.
- Hensel, Lukas, Johannes Hermle, Anselm Rink, and Christopher Roth**, “Party Competition and Political Activism,” *Working Paper*, 2018.
- Jia, Ruixue and Torsten Persson**, “Individual vs. Social Motives in Identity Choice: Theory and Evidence from China,” *Working Paper*, 2018.
- Kendall, Chad, Tommaso Nannicini, and Francesco Trebbi**, “How Do Voters Respond to Information? Evidence from a Randomized Campaign,” *American Economic Review*, 2014, 105 (1), 322–353.
- Madestam, Andreas, Daniel Shoag, Stan Veuger, and David Yanagizawa-Drott**, “Do Political Protests Matter? Evidence From the Tea Party Movement,” *The Quarterly Journal of Economics*, 2013, 128 (4), 1633–1685.
- Manacorda, Marco and Andrea Tesei**, “Liberation Technology: Mobile Phones and Political Mobilization in Africa,” *Working Paper*, 2016.
- Olson, Mancur**, *The Logic of Collective Action: Public Goods and the Theory of Groups*, Schocken Books, 1965.
- Ostrom, Elinor**, “Collective Action and the Evolution of Social Norms,” *The Journal of Economic Perspectives*, 2000, 14 (3), 137–158.

- Palmfrey, Thomas R and Howard Rosenthal**, "Participation and the Provision of Discrete Public Goods: a Strategic Analysis," *Journal of Public Economics*, 1984, 24 (2), 171–193.
- Passarelli, Francesco and Guido Tabellini**, "Emotions and Political Unrest," *Journal of Political Economy*, 2017, 125 (3), 903–946.
- Perez-Truglia, Ricardo and Guillermo Cruces**, "Partisan Interactions," *Journal of Political Economy*, 2017, 125 (4), 1208–1243.
- Pons, Vincent**, "Does Door-to-door Canvassing Affect Vote Shares? Evidence from a Countrywide Field Experiment in France," *American Economic Review* (forthcoming), 2018.
- Shang, Jen and Rachel Croson**, "A Field Experiment in Charitable Contribution: The Impact of Social Information on the Voluntary Provision of Public Goods," *The Economic Journal*, 2009, 119 (540), 1422–1439.
- Uhlener, Carole Jean**, "'Relational Goods' and Participation: Incorporating Sociability into a Theory of Rational Action," *Public Choice*, Sep 1989, 62 (3), 253–285.

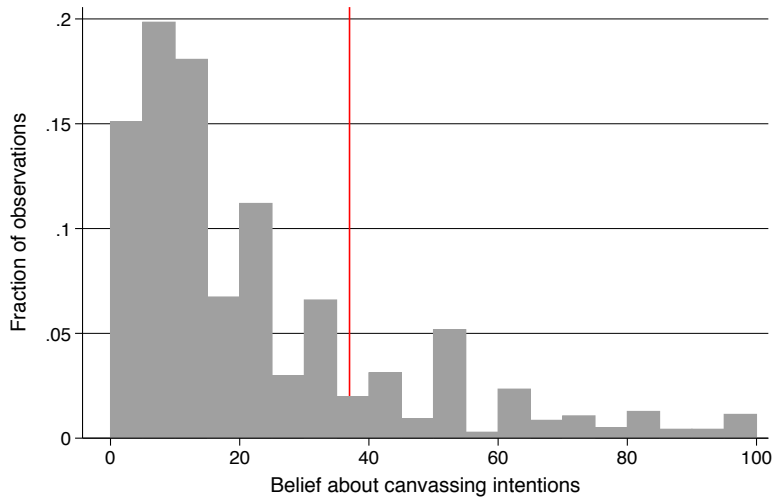
7 Main Figures and Tables

Figure 1: Experimental design



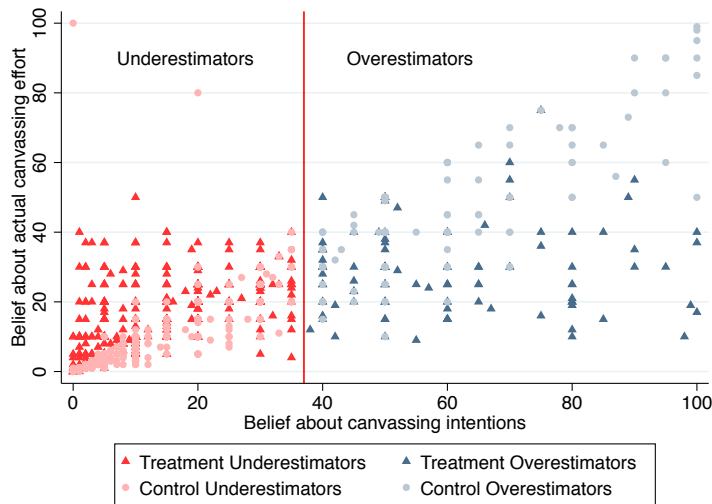
Notes: Figure 1 illustrates the experimental design.

Figure 2: Distribution of pre-treatment beliefs



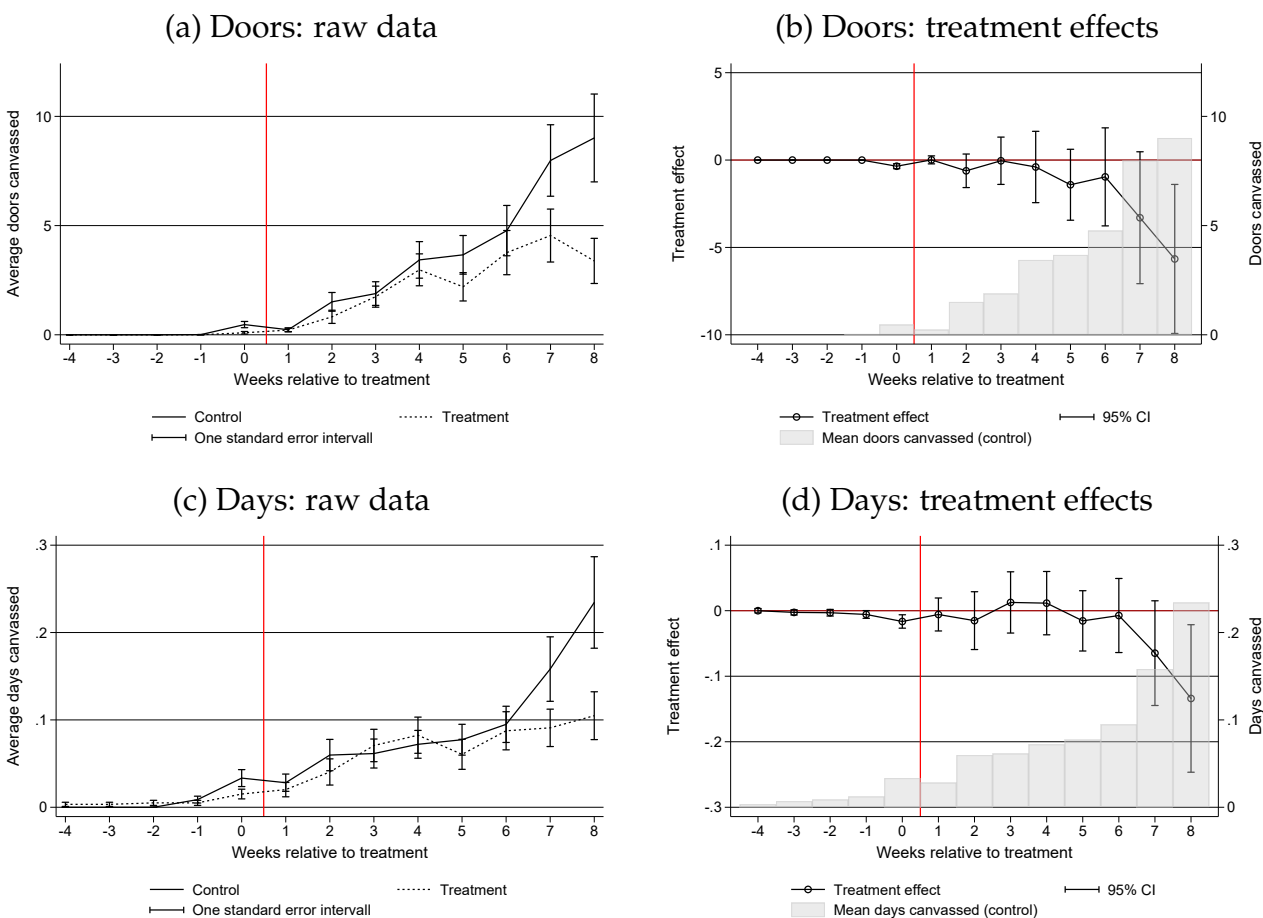
Notes: Figure 2 shows a histogram of pre-treatment beliefs about the fraction of party members who plan to participate in the party’s door-to-door canvassing campaign. The vertical red line (37%) corresponds to the treatment information.

Figure 3: Pre- and post-treatment beliefs in treatment and control group



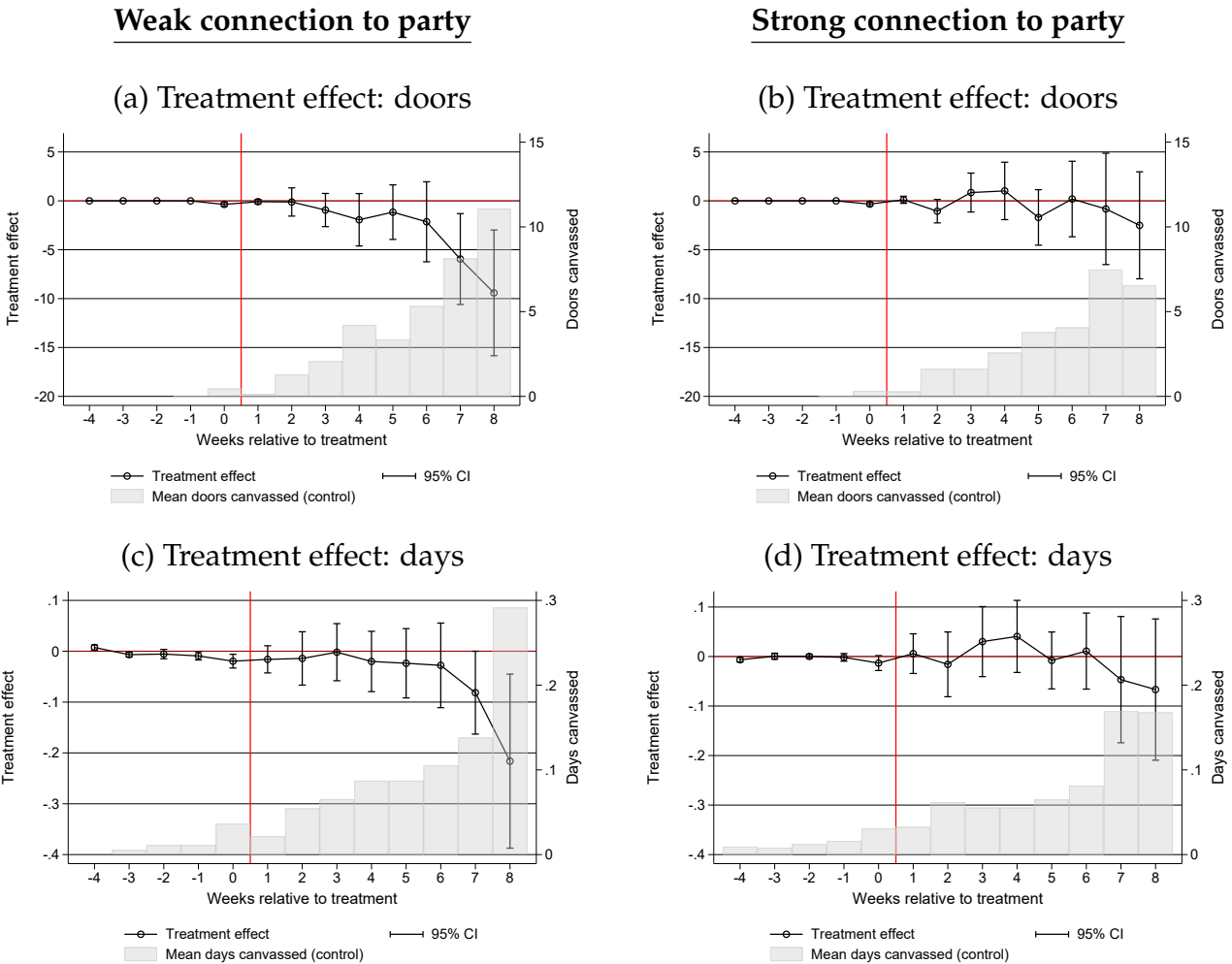
Notes: Figure 3 shows the joint distribution of pre- and post-treatment beliefs. Pre-treatment beliefs concern the fraction of party members who plan to participate in the party’s door-to-door canvassing campaign. Post-treatment beliefs concern the fraction of party members who actually go canvassing. The vertical red line (37%) corresponds to the treatment information. Each dot represents a participant. Red markers represent underestimators, blue markers overestimators. Darker colored triangles indicate participants in the treatment group, lighter colored circles participants in the control group.

Figure 4: Doors and days canvassed over time



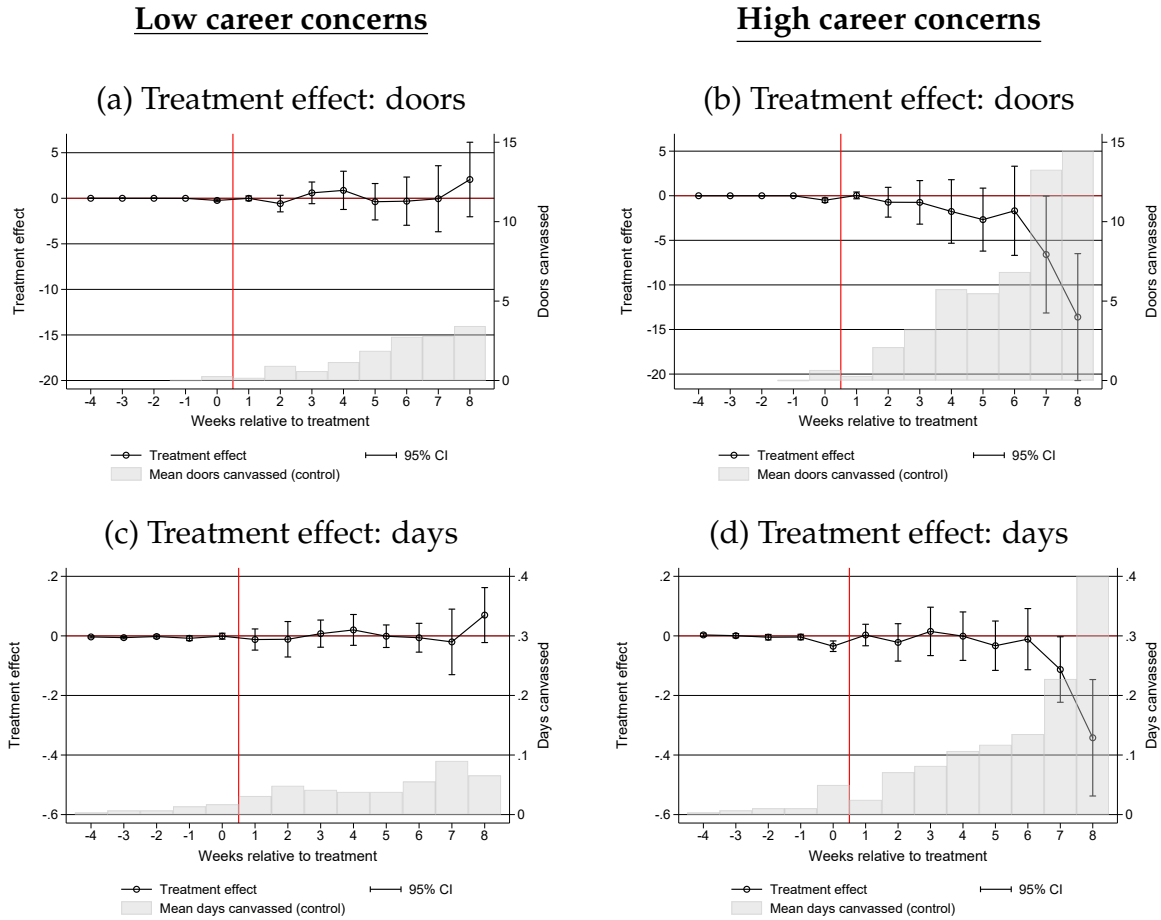
Notes: Figure 4 (a) shows the average number of doors canvassed (winsorized at the 99th percentile) for each week after the treatment. Figure 4 (b) plots the estimates of treatment effects on doors canvassed (winsorized at the 99th percentile) for each week after the treatment. Estimates are obtained by estimating equation (2) separately for each week after the treatment. Pre-specified control variables include: party membership, number of years of party membership, age, sex, 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 federal election and whether a participant has participated in canvassing for this federal election. Shaded bars indicate the average number of doors knocked on in the control group in a given week after the survey. Vertical red lines indicate the timing of treatment. The sample in both figures is restricted to respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Figures 4 (c) and (d) present analogous evidence for days canvassed.

Figure 5: Treatment effects over time by connection to the party



Notes: Figure 5 shows treatment effects over time separately for respondents with below median social connections to the party (panels (a) and (c)) and above median social connections to the party (panels (b) and (d)). The measure for strength of connection to the party is the first principal component of three pre-specified dimensions of heterogeneity (previous canvassing experience, party membership and party membership duration). Figures 5 (a) and (b) plot the estimates of treatment effects on doors canvassed (winsorized at the 99th percentile) for each week after the treatment. Figures 5 (c) and (d) present analogous evidence for days canvassed. The sample in all figures is restricted to respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. All estimates are obtained by estimating equation (2) separately for each week after the treatment. Pre-specified controls are as defined in Figure 4. Shaded bars indicate the average number of doors knocked on in the control group in a given week after the survey. Vertical red lines indicate the timing of treatment.

Figure 6: Treatment effects over time by career concerns



Notes: Figure 6 shows treatment effects over time separately for respondents with below median career concerns (panels (a) and (c)) and above median career concerns (panels (b) and (d)). We do not directly observe career concerns for participants in our experiment. We therefore predict career concerns using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). Career concerns are measured as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). We use a post-LASSO algorithm to predict career concerns for our experimental sample based on pre-determined covariates (Belloni and Chernozhukov, 2013). Figures 6 (a) and (b) plot the estimates of treatment effects on doors canvassed (winsorized at the 99th percentile) for each week after the treatment. Figures 6 (c) and (d) present analogous evidence for days canvassed. The sample in all figures is restricted to respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. All estimates are obtained by estimating equation (2) separately for each week after the treatment. Pre-specified controls are as defined in Figure 4. Shaded bars indicate the average number of doors knocked on in the control group in a given week after the survey. Vertical red lines indicate the timing of treatment.

Table 1: Summary statistics: full sample

	Mean	SD	Median	Min.	Max.	Obs.
Panel A: pooled sample						
<u>Predetermined variables</u>						
Female	0.24	0.43	0.00	0.00	1.00	1411
Age	41.04	19.30	36.00	16.00	100.00	1411
Social ties to party (z-scored)	-0.00	1.00	-0.06	-1.76	2.42	1411
Is party member	0.83	0.38	1.00	0.00	1.00	1411
Years of party membership	12.19	14.22	6.00	0.00	60.00	1411
Has experience canvassing	0.38	0.48	0.00	0.00	1.00	1411
Participated in door-to-door workshop	0.21	0.41	0.00	0.00	1.00	1411
Downloaded app before survey	0.27	0.44	0.00	0.00	1.00	1411
Has canvassed before survey	0.08	0.27	0.00	0.00	1.00	1411
Days canvassed before survey	0.19	0.96	0.00	0.00	16.00	1411
Doors visited before survey	4.38	41.80	0.00	0.00	1071.00	1411
<u>Intention outcomes</u>						
Canvassing: yes	0.49	0.50	0.00	0.00	1.00	1395
Canvassing: days	3.85	7.33	0.00	0.00	60.00	1395
<u>Behavioral outcomes</u>						
Has canvassed after survey	0.12	0.33	0.00	0.00	1.00	1411
Days canvassed after survey	0.59	2.70	0.00	0.00	40.00	1411
Doors canvassed after survey	29.22	137.57	0.00	0.00	1045.00	1411
Panel B: underestimators						
<u>Predetermined variables</u>						
Female	0.21	0.41	0.00	0.00	1.00	1163
Age	41.31	19.04	36.00	16.00	100.00	1163
Social ties to party (z-scored)	0.07	0.98	0.01	-1.76	2.42	1163
Is party member	0.85	0.36	1.00	0.00	1.00	1163
Years of party membership	13.00	14.53	7.00	0.00	60.00	1163
Has experience canvassing	0.39	0.49	0.00	0.00	1.00	1163
Participated in door-to-door workshop	0.21	0.41	0.00	0.00	1.00	1163
Downloaded app before survey	0.26	0.44	0.00	0.00	1.00	1163
Has canvassed before survey	0.08	0.27	0.00	0.00	1.00	1163
Days canvassed before survey	0.20	1.02	0.00	0.00	16.00	1163
Doors visited before survey	5.06	45.87	0.00	0.00	1071.00	1163
<u>Intention outcomes</u>						
Canvassing: yes	0.48	0.50	0.00	0.00	1.00	1148
Canvassing: days	3.48	6.56	0.00	0.00	60.00	1148
<u>Behavioral outcomes</u>						
Has canvassed after survey	0.12	0.32	0.00	0.00	1.00	1163
Days canvassed after survey	0.62	2.86	0.00	0.00	40.00	1163
Doors canvassed after survey	30.80	143.39	0.00	0.00	1045.00	1163
Panel C: overestimators						
<u>Predetermined variables</u>						
Female	0.37	0.48	0.00	0.00	1.00	248
Age	39.74	20.48	33.50	16.00	92.00	248
Social ties to party (z-scored)	-0.33	1.01	-0.42	-1.76	2.24	248
Is party member	0.71	0.46	1.00	0.00	1.00	248
Years of party membership	8.41	12.01	2.00	0.00	55.00	248
Has experience canvassing	0.32	0.47	0.00	0.00	1.00	248
Participated in door-to-door workshop	0.21	0.41	0.00	0.00	1.00	248
Downloaded app before survey	0.30	0.46	0.00	0.00	1.00	248
Has canvassed before survey	0.09	0.28	0.00	0.00	1.00	248
Days canvassed before survey	0.17	0.63	0.00	0.00	5.00	248
Doors visited before survey	1.21	8.07	0.00	0.00	99.00	248
<u>Intention outcomes</u>						
Canvassing: yes	0.52	0.50	1.00	0.00	1.00	247
Canvassing: days	5.57	10.01	2.00	0.00	60.00	247
<u>Behavioral outcomes</u>						
Has canvassed after survey	0.15	0.36	0.00	0.00	1.00	248
Days canvassed after survey	0.46	1.79	0.00	0.00	21.00	248
Doors canvassed after survey	21.85	106.02	0.00	0.00	1045.00	248

Notes: Table 1 presents summary statistics. Panel A contains statistics for the full sample of our experiment. Panel B contains statistics for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel C contains statistics for respondents who overestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign.

Table 2: Main effects

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	5.027*** (0.543)	0.002 (0.026)	-1.098*** (0.361)	-0.013 (0.016)	-0.159 (0.159)	-14.388* (7.839)	-0.093** (0.047)	-0.145** (0.064)	-6.657** (2.814)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table 2 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Outcome variables are as follows. “Posterior” captures the belief about the fraction of fellow party members who actually go canvassing. “Intentions” captures whether a participant intends to engage in any canvassing (*Any*) and the intended number of days (*Days*). “App Data” captures whether a participant actually engages in any canvassing (*Any*), as well as the number of days (*Days*) and number of doors a participant knocks on (*Door*). “Index” indicates a pre-specified index of all five outcome variables capturing canvassing intentions and behavior jointly. “App: Week 7/8” measures days and doors canvassed in weeks 7 and 8 after the treatment (one or two weeks before the election). All specifications but the last two columns are pre-specified in the pre-analysis plan. Treatment effects are obtained conditional on pre-specified control variables: party membership, number of years of party membership, age, sex, 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 federal election and whether a participant has participated in canvassing for this federal election. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Treatment effects and strength of connection to the party

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	4.962*** (0.556)	0.001 (0.026)	-1.152*** (0.364)	-0.013 (0.016)	-0.168 (0.157)	-15.529* (7.920)	-0.099** (0.047)	-0.149** (0.064)	-7.021** (2.828)
Treatment × Strength of connection to party (PCA)	0.909 (0.675)	0.024 (0.026)	0.756** (0.372)	-0.000 (0.013)	0.141 (0.149)	16.661** (7.176)	0.084* (0.045)	0.060 (0.066)	5.310** (2.381)
Strength of connection to party (PCA)	-2.151*** (0.754)	0.267*** (0.039)	1.199** (0.579)	-0.012 (0.023)	-0.266 (0.251)	-19.693 (12.318)	0.118 (0.074)	-0.114 (0.109)	-6.506 (4.394)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table 3 presents treatment effects interacted with a summary measure of connectedness to the party for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. The measure for strength of connection to the party is the first principal component of three pre-specified dimensions of heterogeneity (previous canvassing experience, party membership and party membership duration). This summary measure is standardized to have mean zero and standard deviation one. Outcomes and pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Treatment effects and career concerns

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	5.108*** (0.541)	0.001 (0.026)	-1.108*** (0.361)	-0.013 (0.016)	-0.165 (0.161)	-14.862* (7.915)	-0.096** (0.048)	-0.150** (0.064)	-6.909** (2.847)
Treatment \times Predicted career concerns	-0.644 (0.541)	-0.034 (0.026)	-0.726* (0.370)	-0.002 (0.015)	-0.167 (0.135)	-18.207*** (6.975)	-0.097** (0.045)	-0.124** (0.051)	-6.598*** (2.244)
Predicted career concerns	2.789*** (0.707)	-0.015 (0.035)	0.351 (0.628)	-0.005 (0.025)	-0.007 (0.269)	4.358 (11.414)	0.010 (0.073)	-0.018 (0.082)	-0.454 (3.684)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table 4 presents treatment effects interacted with a supporter’s career concerns for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. We do not directly observe career concerns for participants in our experiment. We therefore predict career concerns using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). Career concerns are measured as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). We use a post-LASSO algorithm to predict career concerns for our experimental sample based on pre-determined covariates (Belloni and Chernozhukov, 2013). The predicted variable is standardized to have mean zero and standard deviation one. The results of the post-LASSO regression are displayed in Table A8. Outcomes and pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: IV estimates: post-treatment beliefs and effort

	Intentions		App Data			Index	App: Week 7/8	
	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Main Effect (IV)								
Posterior	0.000 (0.005)	-0.220*** (0.077)	-0.003 (0.003)	-0.033 (0.032)	-2.990* (1.623)	-0.019* (0.010)	-0.030** (0.013)	-1.368** (0.590)
Observations	1148	1148	1163	1163	1163	1148	1163	1163
Panel B: Weak connection to party (IV)								
Posterior	-0.003 (0.008)	-0.346*** (0.132)	-0.002 (0.005)	-0.068 (0.046)	-6.034** (2.739)	-0.033** (0.016)	-0.046** (0.021)	-2.495*** (0.966)
Observations	547	547	554	554	554	547	554	554
Panel C: Strong connection to party (IV)								
Posterior	0.003 (0.007)	-0.116 (0.093)	-0.003 (0.004)	-0.002 (0.045)	-0.587 (2.093)	-0.006 (0.013)	-0.016 (0.018)	-0.465 (0.784)
Observations	601	601	609	609	609	601	609	609
Panel D: Low career concerns (IV)								
Posterior	0.007 (0.007)	-0.059 (0.094)	-0.002 (0.004)	0.005 (0.034)	0.657 (1.270)	0.002 (0.010)	0.004 (0.014)	0.189 (0.541)
Observations	547	547	554	554	554	547	554	554
Panel E: High career concerns (IV)								
Posterior	-0.005 (0.007)	-0.394*** (0.127)	-0.004 (0.005)	-0.079 (0.055)	-7.131** (3.210)	-0.041** (0.017)	-0.067*** (0.024)	-3.101*** (1.142)
Observations	601	601	609	609	609	601	609	609

Notes: Table 5 presents IV estimates for the impact of post-treatment beliefs for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign (Panel A). Post-treatment beliefs about actual participation are instrumented with the treatment indicator. Outcomes and pre-specified controls are as defined in Table 2. Panels B and C show effects for supporters with above and below median strength of connection to the party, respectively. The measure for strength of connection to the party is the first principal component of three pre-specified dimensions of heterogeneity (previous canvassing experience, party membership and party membership duration). Panels D and E show effects for supporters with low and high career concerns, respectively. We do not directly observe career concerns for participants in our experiment. We therefore predict career concerns using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). Career concerns are measured as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). We use a post-LASSO algorithm to predict career concerns for our experimental sample based on pre-determined covariates (Belloni and Chernozhukov, 2013). The predicted variable is standardized to have mean zero and standard deviation one. The results of the post-LASSO regression are displayed in Table A8. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Online Appendix

Online Appendix Section A provides supplementary proofs and derivations. Online Appendix Section B provides the invitation email, followed by Online Appendix Section C providing the survey instrument. Online Appendix Section D describes deviations from the pre-analysis plan.

Online Appendix Section E contains additional figures. Figure A1 displays the relationship between intentions and actual canvassing behavior. Figure A2 show the cumulative distribution of intended days as well as actual days and doors canvassed.

Online Appendix Section F contains additional tables. Table A1 shows balance tests. Table A2 displays treatment effects on application download. Table A3 presents the main results using randomization inference. Table A4 compares high and low social connection respondents in the post-election survey. Table A5 shows heterogeneity by previous canvassing experience. Table A6 shows heterogeneity by party membership. Table A7 displays heterogeneity by party membership duration. Table A8 displays the results of the post-LASSO regressions to predict career concerns. Table A9 shows treatment effects on social media campaigning activity. Table A10 shows the relationship between beliefs about the canvassing effort of fellow party membes and canvassing outcomes in the control group. Table A11 shows the effects by application download prior to the experiment. Tables A12 to A20 provide results for overestimators. Tables A21 to A29 provide results for underestimators without pre-specified controls.

A Mathematical Appendix

We model agent i 's utility of choosing her own canvassing effort d_i given fellow supporters' canvassing effort (d_{-i}) according to:

$$u_i(d_i) = (1 - \alpha_i)g(d_i, d_{-i}) + \alpha_i h(d_i, d_{-i}) - c_i(d_i) - \tilde{c}_i \cdot \mathbb{1}(d_i > 0) \quad (3)$$

where $g(d_i, d_{-i})$ represents the instrumental utility gained from either the overall level of canvassing activity (i.e. additional votes) or the utility gained from signaling one's commitment. We assume $\frac{\partial g(d_i, d_{-i})}{\partial d_i} > 0$ and $\frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}} < 0$. The term $h(d_i, d_{-i})$ represents social motives. We assume $\frac{\partial h(d_i, d_{-i})}{\partial d_i} \geq 0$ and $\frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}} > 0$. The term α_i denotes an individual-specific relative weight on social motives. $c_i(d_i)$ represents individual-specific costs of canvassing for which we assume $c'(0) = 0$, and $c', c'' > 0$. For $g(\cdot)$, $h(\cdot)$, and $c(\cdot)$ we assume continuity and that they are twice differentiable. \tilde{c}_i is an individual-specific fixed costs of doing any canvassing distributed according to F . Agent i chooses d_i to maximize her utility u_i , where the reservation utility from not engaging in canvassing is equal to $(1 - \alpha_i)g(0, d_{-i})$. We assume that all idiosyncratic properties are summarized by type $i \in I$, distributed according to $\Phi \perp F$.

Formally, agents choose $d_i \geq 0$ such that

$$d_i^* = \operatorname{argmax}_{d_i} (1 - \alpha_i)g(d_i, d_{-i}) + \alpha_i h(d_i, d_{-i}) - c_i(d_i) - \tilde{c}_i \cdot \mathbb{1}(d_i > 0) \quad (4)$$

if $u_i(d_i^*) \geq (1 - \alpha_i)g(0, d_{-i})$ and $d_i^* = 0$ otherwise.

First, we investigate intensive margin responses and focus on interior solutions of this optimization problem. In this case, agent i sets her canvassing effort d_i according to the following first order condition:

$$\frac{\partial u(d_i)}{\partial d_i} = (1 - \alpha_i) \frac{\partial g(d_i, d_{-i})}{\partial d_i} + \alpha_i \frac{\partial h(d_i, d_{-i})}{\partial d_i} - \frac{\partial c_i(d_i)}{\partial d_i} = 0 \quad (5)$$

Without further functional form assumptions there is no closed form solution for the optimal effort choice d_i^* . However, it is possible to analyze i 's optimal response to

changes in d_{-i} using implicit differentiation:

$$\frac{\partial d_i^*}{\partial d_{-i}} = - \frac{(1 - \alpha_i) \frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}} + \alpha_i \frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}}}{(1 - \alpha_i) \frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_i} + \alpha_i \frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_i} - \frac{\partial^2 c(d_i)}{\partial d_i \partial d_i}} \quad (6)$$

Note that the denominator is negative, as we require d^* to be at a local maximum. This is guaranteed, for instance, if we assume $\frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_i} < 0$ and $\frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_i} \leq 0$. This immediately yields the intensive margin result presented in the main text.

Next, we investigate how $\frac{\partial d_i^*}{\partial d_{-i}}$ varies with the strength of social motives. Consider the case where $\alpha_i = 0$, that is the weight on social motives is zero. Then,

$$\left. \frac{\partial d_i^*}{\partial d_{-i}} \right|_{\alpha_i=0} = - \frac{\frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_{-i}}}{\frac{\partial^2 g(d_i, d_{-i})}{\partial d_i \partial d_i} - \frac{\partial^2 c(d_i)}{\partial d_i \partial d_i}} < 0. \quad (7)$$

In the case where $\alpha_i = 1$,

$$\left. \frac{\partial d_i^*}{\partial d_{-i}} \right|_{\alpha_i=1} = - \frac{\frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_{-i}}}{\frac{\partial^2 h(d_i, d_{-i})}{\partial d_i \partial d_i} - \frac{\partial^2 c(d_i)}{\partial d_i \partial d_i}} > 0. \quad (8)$$

As $\frac{\partial d_i^*}{\partial d_{-i}}$ is continuous in α_i , we can draw two conclusions. There exists a cutoff-level $\underline{\alpha}_i$ such that individuals with $\alpha_i < \underline{\alpha}_i$ exhibit strategic substitutability. Vice versa, there exists a cutoff-level $\bar{\alpha}_i$ such that individuals with $\alpha_i > \bar{\alpha}_i$ exhibit strategic complementarity.

Next, we consider extensive margin responses. Note that for each individual of type i there exists a cutoff value $\tilde{c}_i^* = (1 - \alpha_i)g(d_i^*, d_{-i}) + \alpha_i h(d_i^*, d_{-i}) - c_i(d_i^*) - (1 - \alpha_i)g(0, d_{-i})$ such that the individual chooses to engage in canvassing iff $\tilde{c}_i \leq \tilde{c}_i^*$. Hence, the fraction of individuals of type i deciding to engage in canvassing is equal to

$$F\left((1 - \alpha_i)g(d_i^*, d_{-i}) + \alpha_i h(d_i^*, d_{-i}) - c_i(d_i^*) - (1 - \alpha_i)g(0, d_{-i})\right). \quad (9)$$

Taking the derivative with respect to d_{-i} yields

$$\left((1 - \alpha_i) \left(\frac{\partial g(d_i^*, d_{-i})}{\partial d_{-i}} - \frac{\partial g(0, d_{-i})}{\partial d_{-i}} \right) + \alpha_i \frac{\partial h(d_i^*, d_{-i})}{\partial d_{-i}} \right) \cdot f(\tilde{c}_i^*). \quad (10)$$

Given g is concave in d_i , $\frac{\partial g(d_i^*, d_{-i})}{\partial d_{-i}} - \frac{\partial g(0, d_{-i})}{\partial d_{-i}}$ will be unambiguously negative. Hence, for low α_i the above term will be negative. If we assume $\frac{h(d_i, d_{-i})}{\partial d_{-i}} \geq 0$, i.e. social utility increases in the participation of others, reflecting the quality of canvassing as a relational good, the sign of the effect is ambiguous and depends on the relative strength of social motives α_i . Most importantly, however, extensive margin responses depend critically on the mass of individuals $f(\tilde{c}_i^*)$ who are marginal. Hence, we expect the relative strength of intensive and extensive margin responses to depend on the degree of how many individuals are marginal in their decision to do any canvassing. Aggregating over all individuals yields

$$\int_{i \in I} \left((1 - \alpha_i) \left(\frac{\partial g(d_i^*, d_{-i})}{\partial d_{-i}} - \frac{\partial g(0, d_{-i})}{\partial d_{-i}} \right) + \alpha_i \frac{\partial h(d_i^*, d_{-i})}{\partial d_{-i}} \right) \cdot f(\tilde{c}_i^*) d\Phi. \quad (11)$$

B Invitation email

Dear 'name',

the critical stage of the election campaign is imminent. We have conducted workshops in almost all constituencies and the feedback was resoundingly positive. Now it's up to us. We are all out to canvass to help [party name] win the election.

To help our campaign succeed, we ask you to respond to a short survey. We would like to know if you have any suggestions and to what extent you plan to participate in the campaign. Your answers will of course be treated confidentially.

Here is the link to the survey:

Survey

It would be great if you could support us with this survey. Just click on the link right now. The survey only takes five minutes.

C Survey instrument

- **Introduction**

Dear 'name',

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

Thank you very much for your help!

- **Sex**

What is your sex?

- **Age**

How old are you?

- **Party member**

Are you a member of [party name] party?

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

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

- **Canvassing workshop**

Have you ever participated in a canvassing training workshop?

- **Canvassing experience**

Do you have experiences from canvassing in previous election campaigns?

- **Pre-treatment belief**

Think of 100 typical [party name] party members.

What do you think: How many of these 100 [party name] party members plan to engage in canvassing during this election campaign?

- **Treatment text**

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

According to a survey of [party name] party members, 37 of 100 [party name] party members plan to engage in canvassing during this election campaign.

- **Post-treatment belief**

What do you think: How many of these 100 [party name] party members will actually engage in canvassing during this election campaign?

- **Extensive margin**

Do you plan to canvass during this election campaign?

- **Intensive margin** (asked if extensive margin is yes)

On how many days do you plan to canvass during this election campaign?

- **Debrief**

Now let's go! And don't forget to download the [party name]-application. Here for [iOS](#) and [Android](#).

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

D Deviations from pre-analysis plan

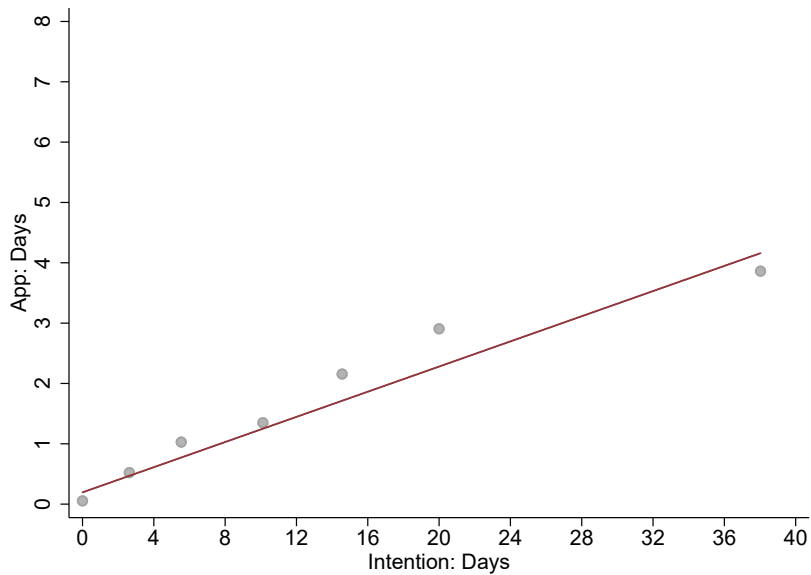
This section describes where the analysis presented in the paper deviates from the pre-analysis plan uploaded to the AEA RCT registry (AEARCTR-0002358). The pre-analysis plan contains pre-registered analyses for two separate experiments (“own party” and “other party” group). We present the results of these experiments in two different papers. This paper describes the results of the “own party” experiment. The results of the “other party” group are presented in Hensel et al. (2018) which is available upon request from the authors.

For the analysis of the experiment presented in this paper, we deviated in the following points from the pre-analysis plan:

- We conduct additional analysis not covered in the pre-analysis plan. This includes the following analysis:
 - Any analysis of temporal patterns of treatment effects, including the impacts on doors and days in week 7/8.
 - Heterogeneity by strength of connection to the party (PCA of three pre-specified control variables) and predicted career concerns.
 - The impact of the treatment on social media campaigning.
 - An IV-analysis instrumenting post-treatment beliefs with treatment assignment.
- We also include randomization inference as an additional robustness check.

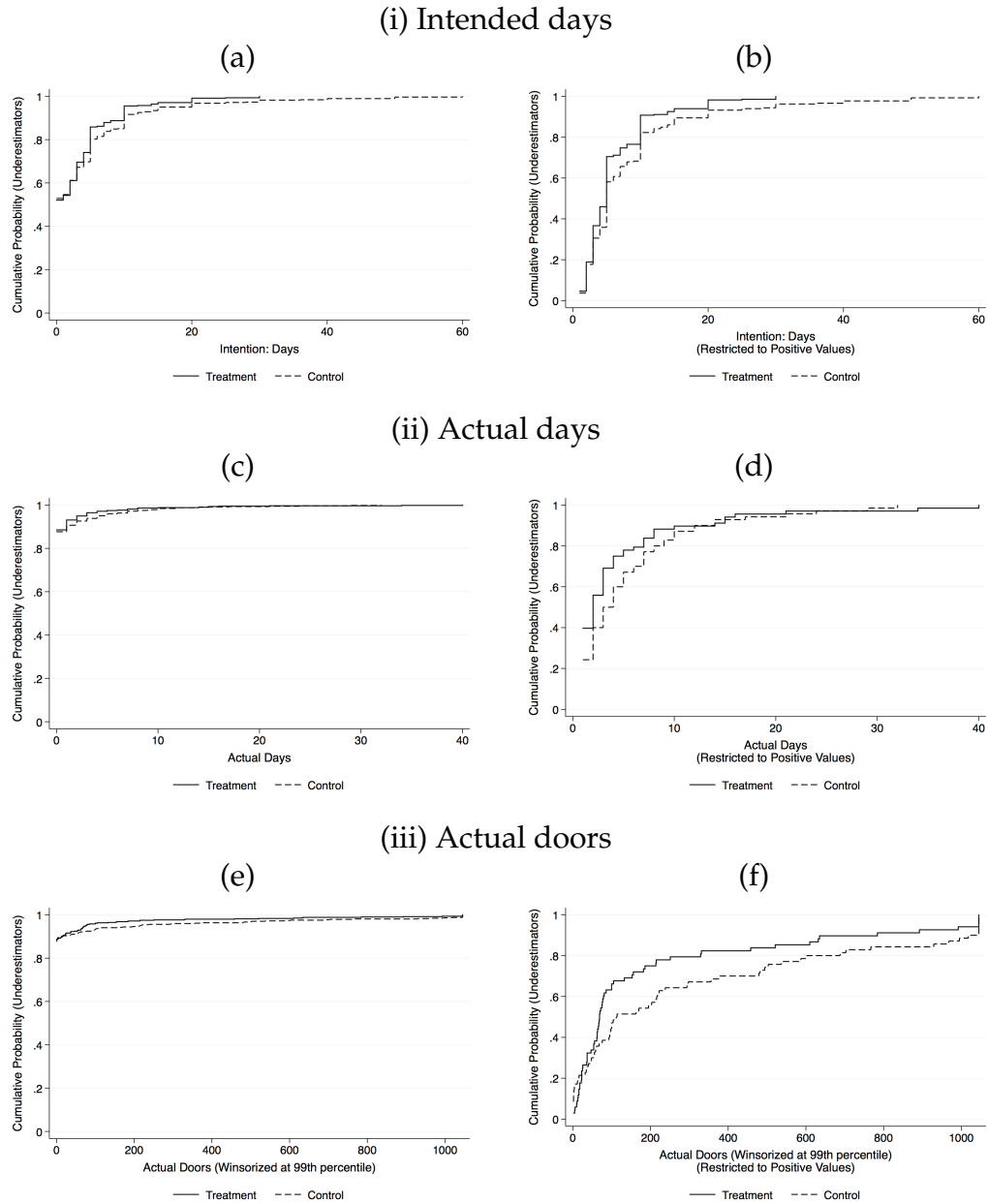
E Online Appendix Figures

Figure A1: Intentions vs. behavior (data from survey and online application)



Notes: Figure A1 shows a binscatter plot between intended number of days and number of days canvassing as recorded through the online application. The regression line indicates the best linear fit.

Figure A2: Cumulative distribution function of key outcomes



Notes: Figures A2 a-f show cumulative distribution functions (cdfs) of three key outcomes: (i) intended days canvassing, (ii) actual days canvassing, (iii) actual doors knocked on (winsorized at 99th percentile). The cdfs are plotted for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Post-treatment beliefs about actual participation are instrumented with the treatment indicator. The panels (a), (c), and (e) show the distribution for all observations, panels (b), (d), and (f) show the distribution for positive observations only.

F Online Appendix Tables

Table A1: Balance tests

	Treatment	Control	Δ	se(Δ)	p($\Delta=0$)
Female	0.229	0.245	-0.016	(0.023)	0.484
Age	40.274	41.805	-1.532	(1.027)	0.136
Is party member	0.821	0.832	-0.012	(0.020)	0.568
Years of party membership	11.731	12.654	-0.922	(0.757)	0.223
Has experience canvassing	0.384	0.371	0.013	(0.026)	0.617
Participated in door-to-door workshop	0.201	0.220	-0.020	(0.022)	0.359
Downloaded app before survey	0.287	0.256	0.031	(0.024)	0.195
Has canvassed before survey	0.081	0.078	0.002	(0.014)	0.875
Days canvassed before survey	0.185	0.203	-0.018	(0.051)	0.719
Doors visited before survey	3.192	5.576	-2.384	(2.229)	0.285
Prior Belief: % of party members who canvass	19.860	20.727	-0.867	(1.123)	0.440
Number of observations	708	703			

Notes: Table A1 presents balance tests for the treatment and control group in our experiment. Columns 1 and 2 report variable means. Column 3 reports difference in means. Column 4 reports the associated heteroskedasticity robust standard error. Column 5 the p-value of a test of equality of means. We regress the treatment indicator on all covariates to test for joint significance. The p-value of this joint F-test is 0.59.

Table A2: Treatment effects on application download

	Survey	App Data		
	click on app-link	within 24h	within one week	any time after survey
Treatment	-0.006 (0.012)	0.005 (0.008)	-0.005 (0.009)	0.010 (0.014)
Observations	1163	1163	1163	1163
Control group mean	0.04	0.02	0.03	0.05

Notes: Table A2 presents treatment effects on application download for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Pre-specified controls are as defined in Table 2.

Table A3: Main effects - randomization inference

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	5.027 [0.0000]	0.002 [0.9299]	-1.098 [0.0025]	-0.013 [0.4168]	-0.159 [0.3145]	-14.388 [0.0648]	-0.093 [0.0477]	-0.145 [0.0219]	-6.657 [0.0128]
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table A3 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. p-values based on randomization inference with 10,000 draws are displayed in brackets. Outcomes and pre-specified controls are as defined in Table 2.

Table A4: Comparison of supporters with weak and strong connection to the party

	Weak connections to party	Strong connections to party	P-value(Weak con. = Strong con.)	N
Number of known party member	26.99	49.50	0.000	902
Identification with party (z-scored)	-0.13	0.14	0.000	884
Identification with party platform (z-scored)	-0.11	0.12	0.000	877

Notes: Table A4 presents summary statistics for supporters with below and above median strength of connections to the party. Connection to the party is measured as first principal component of the three pre-specified dimensions of heterogeneity (canvassing experience prior to the federal election, party membership dummy, and party membership duration). Columns 1 and 2 report variable means. Column 3 reports the p-value of a test of equality of means. Column 4 reports the number of observations. The data was collected about two months after the election through a sample of the same population of party supporters but excluding participants in the main experiment. Row 1 reports the self-reported number of party members individuals know personally. Row 2 reports the means of z-scored responses to the question “How close are you to the party?” on a seven point Likert-scale. Row 3 reports the means of z-scored responses to the question “How much do you support the party platform?” on a seven point Likert-scale.

Table A5: Treatment effects by canvassing experience

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Inexperienced supporters									
Treatment	4.566*** (0.738)	-0.014 (0.032)	-1.356*** (0.447)	-0.010 (0.018)	-0.295* (0.171)	-25.112*** (9.638)	-0.142** (0.056)	-0.205*** (0.077)	-11.075*** (3.474)
Control mean	9.872	0.376	3.382	0.101	0.657	39.110	-0.126	0.300	14.187
Observations	701	700	700	710	710	710	700	710	710
Panel B: Experienced supporters									
Treatment	5.675*** (0.785)	0.025 (0.042)	-0.722 (0.608)	-0.015 (0.028)	0.088 (0.323)	3.527 (13.850)	-0.012 (0.086)	-0.045 (0.114)	0.780 (4.884)
Control mean	7.850	0.626	5.041	0.158	0.770	37.158	0.122	0.293	11.959
Observations	449	448	448	453	453	453	448	453	453

Notes: Table A5 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters without previous canvassing experience, Panel B contains the sample of supporters with previous canvassing experience. Outcomes and pre-specified controls are as defined in Table 2.

Table A6: Treatment effects by party membership

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No party member									
Treatment	2.590 (2.096)	0.002 (0.064)	-2.420** (1.037)	-0.029 (0.026)	-0.506 (0.343)	-36.275* (20.542)	-0.227* (0.116)	-0.196 (0.156)	-10.681 (7.353)
Control mean	13.012	0.367	4.266	0.061	0.573	41.854	-0.129	0.183	9.976
Observations	168	167	167	172	172	172	167	172	172
Panel B: Party member									
Treatment	5.461*** (0.535)	0.004 (0.028)	-0.857** (0.386)	-0.009 (0.018)	-0.104 (0.180)	-10.520 (8.608)	-0.069 (0.053)	-0.142* (0.073)	-6.193** (3.135)
Control mean	10.623	0.475	4.311	0.113	0.621	47.782	-0.016	0.258	12.597
Observations	982	981	981	991	991	991	981	991	991

Notes: Table A6 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of non-party members, Panel B contains the sample of party members. Outcomes and pre-specified controls are as defined in Table 2.

Table A7: Treatment effects by party membership duration

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Below med. membership dur.									
Treatment	4.612*** (0.797)	-0.033 (0.036)	-1.751*** (0.542)	-0.007 (0.023)	-0.215 (0.229)	-25.117* (12.932)	-0.156** (0.071)	-0.218** (0.089)	-10.721** (4.364)
Control mean	9.900	0.523	4.674	0.141	0.827	52.676	0.076	0.363	17.359
Observations	575	574	574	582	582	582	574	582	582
Panel B: Above med. membership dur.									
Treatment	5.465*** (0.723)	0.044 (0.036)	-0.419 (0.475)	-0.020 (0.021)	-0.135 (0.223)	-5.952 (9.087)	-0.034 (0.063)	-0.087 (0.096)	-3.219 (3.739)
Control mean	8.278	0.424	3.392	0.105	0.575	24.070	-0.133	0.232	9.291
Observations	575	574	574	581	581	581	574	581	581

Notes: Table A7 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters who have a below median party membership duration (including non-members), Panel B contains the sample of supporters who have above median membership duration. Outcomes and pre-specified controls are as defined in Table 2.

Table A8: Predicting career concerns

	(1) Career concern
Age	-0.0116*** (0.00200)
Experienced supporter	-0.276*** (0.0647)
Canvassed before experiment	0.0699 (0.0750)
Canvassing workshop	-0.0910 (0.0979)
Years of party membership	-0.0192*** (0.00489)
Years party membership squared	0.000233*** (0.0000870)
Age × party member	0.00504** (0.00207)
Age × canvassing workshop	-0.00109 (0.00273)
Female × experienced supporter	0.104 (0.0829)
Female × canvassed before experiment	-0.171 (0.106)
Female × party member	-0.0858 (0.146)
Female × canvassing workshop	0.160** (0.0810)
Female × years party membership	-0.00177 (0.00348)
Experienced supporter × canvassing workshop	0.186** (0.0774)
Experienced supporter × years party membership	0.00622** (0.00245)
Experienced supporter × canvassed before experiment	0.186** (0.0946)
Canvassed before experiment × years party membership	-0.0166*** (0.00321)
Canvassing workshop × years party membership	-0.00220 (0.00406)
Female	-0.0630 (0.133)
Constant	1.102*** (0.0511)
R-squared	0.270
Number of observations	744

Notes: Table A8 presents the results of a OLS regression of variables selection by a LASSO algorithm on career concerns. Career concerns are defined as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). The sample is obtained using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). The post-LASSO algorithm has two steps. First, we selected variables using a LASSO algorithm with the penalty parameter λ chosen optimally through 10-fold cross-validation. The set of predetermined variables includes the following variables and all pairwise interactions: age, age squared, party membership, years of party membership, years of party membership squared, sex, a dummy for whether a participant has participated in a canvassing workshop, a dummy indicating any prior canvassing experience before this federal election, and dummies for whether the supporter has already canvassed in this election before the survey. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Effects on effort in alternative domain: social media activity

	Shared social media message		
	Any	Days	Total
Treatment	-0.011 (0.014)	-0.052 (0.120)	-0.148 (0.220)
Control mean	0.074	0.388	0.782
Observations	1163	1163	1163

Notes: Table A9 presents treatment effects on social media activity for respondents who underestimate the share of fellow 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. Pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: OLS estimates: beliefs about peers and effort (control group)

	Intentions		App Data			Index	App: Week 7/8	
	Any	Days	Any	Days	Door	Overall	Days	Doors
Posterior	0.002 (0.002)	0.044 (0.031)	0.001 (0.001)	0.016 (0.011)	1.209* (0.695)	0.007* (0.004)	0.007 (0.005)	0.464* (0.247)
Observations	562	562	569	569	569	562	569	569

Notes: Table A10 presents OLS estimates for the impact of beliefs about fellow supporters' canvassing effort for control group respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Outcomes and pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Treatment effects by application download

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No app download									
Treatment	4.341*** (0.664)	-0.001 (0.031)	-0.813** (0.404)	-0.003 (0.011)	-0.144 (0.093)	-8.556* (4.536)	-0.062* (0.038)	-0.091* (0.049)	-3.218* (1.696)
Control mean	9.438	0.366	2.908	0.026	0.206	10.848	-0.304	0.114	4.241
Observations	844	842	842	855	855	855	842	855	855
Panel B: App download									
Treatment	6.816*** (0.839)	0.000 (0.045)	-1.985** (0.786)	-0.037 (0.051)	-0.119 (0.531)	-26.455 (26.353)	-0.168 (0.142)	-0.259 (0.193)	-13.605 (9.169)
Control mean	8.000	0.799	7.439	0.418	2.206	121.823	0.808	0.851	40.872
Observations	306	306	306	308	308	308	306	308	308

Notes: Table A11 presents treatment effects for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters who had not downloaded the application before the treatment, Panel B contains the sample of supporters who had downloaded the application before the treatment. Outcomes and pre-specified controls are as defined in Table 2.

Results for overestimators

Table A12: Main effects (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	-16.686*** (1.973)	-0.081 (0.053)	-0.926 (1.227)	-0.029 (0.038)	-0.097 (0.186)	-9.009 (12.265)	-0.125 (0.086)	0.003 (0.055)	-2.561 (4.030)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	247	247	247	248	248	248	247	248	248

Notes: Table A12 presents treatment effects for respondents who overestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Outcomes and pre-specified controls are as defined in Table 2.

Table A13: Treatment effects and strength of connection to the party (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	-14.664*** (1.868)	-0.082 (0.056)	-0.197 (1.511)	-0.019 (0.039)	-0.005 (0.242)	-3.978 (13.765)	-0.073 (0.099)	0.018 (0.069)	-1.254 (4.431)
Treatment × Strength of connection to party (PCA)	6.173*** (2.099)	-0.002 (0.054)	2.226 (1.519)	0.029 (0.035)	0.282 (0.248)	15.503 (13.686)	0.158 (0.099)	0.046 (0.069)	4.029 (3.704)
Strength of connection to party (PCA)	-3.895 (2.816)	0.326*** (0.076)	1.460 (1.552)	0.047 (0.050)	0.486* (0.258)	22.224 (17.751)	0.356*** (0.112)	0.166* (0.086)	4.632 (5.305)
Control mean	45.313	0.545	5.754	0.149	0.440	22.515	0.034	0.119	7.157
Observations	247	247	247	248	248	248	247	248	248

Notes: Table A13 presents treatment effects interacted with a summary measure of connectedness to the party for respondents who overestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. The measure for strength of connection to the party is the first principal component of three pre-specified dimensions of heterogeneity (previous canvassing experience, party membership and party membership duration) obtained from a principal component analysis. This summary measure is standardized to have mean zero and standard deviation one. Outcomes and pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: Treatment effects and career concerns (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	-16.324*** (1.998)	-0.082 (0.054)	-0.973 (1.237)	-0.030 (0.037)	-0.112 (0.174)	-9.033 (11.829)	-0.130 (0.086)	-0.006 (0.052)	-2.707 (3.854)
Treatment × Predicted career concerns	-4.774** (1.959)	0.021 (0.053)	-1.095 (1.652)	0.007 (0.039)	-0.077 (0.190)	-6.900 (9.404)	-0.043 (0.101)	0.020 (0.057)	1.171 (2.440)
Predicted career concerns	3.481 (3.124)	-0.046 (0.074)	3.829** (1.831)	0.015 (0.062)	0.590 (0.459)	19.131 (25.621)	0.217 (0.151)	0.158 (0.122)	0.486 (8.348)
Control mean	45.313	0.545	5.754	0.149	0.440	22.515	0.034	0.119	7.157
Observations	247	247	247	248	248	248	247	248	248

Notes: Table A14 presents treatment effects interacted with a supporter’s career concerns for respondents who overestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. We do not directly observe career concerns for participants in our experiment. We therefore predict career concerns using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). Career concerns are measured as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). We use a post-LASSO algorithm to predict career concerns for our experimental sample based on pre-determined covariates (Belloni and Chernozhukov, 2013). The predicted variable is standardized to have mean zero and standard deviation one. The results of the post-LASSO regression are displayed in Table A8. Outcomes and pre-specified controls are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15: IV estimates: post-treatment beliefs and effort choices (overestimators)

	Intentions		App Data			Index	App: Week 7/8	
	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Main Effect (IV)								
Posterior	0.005 (0.003)	0.055 (0.072)	0.002 (0.002)	0.006 (0.011)	0.541 (0.730)	0.007 (0.005)	-0.000 (0.003)	0.155 (0.241)
Observations	247	247	248	248	248	247	248	248
Panel B: Weak connection to party (IV)								
Posterior	0.005 (0.003)	0.089 (0.062)	0.002 (0.002)	0.011 (0.008)	0.767 (0.698)	0.010** (0.005)	0.002 (0.002)	0.192 (0.180)
Observations	151	151	151	151	151	151	151	151
Panel C: Strong connection to party (IV)								
Posterior	0.005 (0.009)	-0.126 (0.261)	-0.005 (0.006)	-0.086 (0.071)	-4.228 (3.624)	-0.023 (0.020)	-0.020 (0.020)	-1.066 (1.116)
Observations	96	96	97	97	97	96	97	97
Panel D: Low career concerns (IV)								
Posterior	0.005 (0.006)	0.002 (0.153)	0.001 (0.003)	-0.006 (0.015)	-0.751 (0.816)	0.002 (0.009)	0.001 (0.005)	0.019 (0.277)
Observations	151	151	151	151	151	151	151	151
Panel E: High career concerns (IV)								
Posterior	0.003 (0.003)	0.061 (0.069)	0.001 (0.003)	0.007 (0.015)	0.838 (0.916)	0.007 (0.006)	-0.002 (0.004)	0.027 (0.227)
Observations	96	96	97	97	97	96	97	97

Notes: Table A15 presents IV estimates for the impact of post-treatment beliefs for all overestimators (Panel A). Post-treatment beliefs are instrumented with the treatment indicator. Parallel to Table 5, Panels (B) and (C) distinguish between supporters with weak and strong connections to the party, whereas panels (D) and (E) distinguish between supporters with low and high career concerns. Outcomes and pre-specified controls are as defined in Table 2.

Table A16: Treatment effects on application download (overestimators)

	Survey	App Data		
	click on app-link	within 24h	within one week	any time after survey
Treatment	-0.003 (0.029)	0.014 (0.025)	0.009 (0.026)	-0.021 (0.033)
Observations	248	248	248	248
Control group mean	0.06	0.03	0.04	0.08

Notes: Table A16 presents treatment effects on application download for respondents who overestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Pre-specified controls are as defined in Table 2.

Table A17: Treatment effects by canvassing experience (overestimators)

	Posterior Belief	Intentions		App Data			Index Overall	App: Week 7/8	
		Any	Days	Any	Days	Door		Days	Doors
Panel A: Inexperienced supporters									
Treatment	-18.640*** (2.439)	-0.059 (0.064)	-1.435 (1.170)	-0.054 (0.045)	-0.182 (0.129)	-8.344 (9.971)	-0.159* (0.091)	-0.064 (0.048)	-5.094 (4.500)
Control mean	46.211	0.442	5.084	0.137	0.326	15.895	-0.079	0.105	6.737
Observations	168	168	168	168	168	168	168	168	168
Panel B: Experienced supporters									
Treatment	-12.179*** (3.111)	-0.101 (0.099)	-0.384 (2.696)	0.034 (0.062)	0.310 (0.584)	-1.601 (38.897)	-0.010 (0.196)	0.168 (0.158)	3.191 (10.280)
Control mean	43.128	0.795	7.385	0.179	0.718	38.641	0.309	0.154	8.179
Observations	79	79	79	80	80	80	79	80	80

Notes: Table A17 presents treatment effects for respondents who overestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of respondents without prior canvassing experience, Panel B contains the sample of respondents with prior canvassing experience. Outcomes and pre-specified controls are as defined in Table 2.

Table A18: Treatment effects by party membership (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No party member									
Treatment	-24.088*** (4.891)	-0.123 (0.121)	-4.222** (1.998)	-0.022 (0.076)	-0.101 (0.211)	-11.433 (21.474)	-0.266* (0.148)	0.031 (0.084)	-1.727 (5.324)
Control mean	49.556	0.528	7.722	0.194	0.500	45.111	0.177	0.111	11.250
Observations	73	73	73	73	73	73	73	73	73
Panel B: Party member									
Treatment	-13.650*** (2.034)	-0.075 (0.065)	0.880 (1.872)	-0.000 (0.048)	0.101 (0.313)	6.505 (15.453)	0.014 (0.122)	0.002 (0.088)	0.706 (5.200)
Control mean	43.755	0.551	5.031	0.133	0.418	14.214	-0.019	0.122	5.653
Observations	174	174	174	175	175	175	174	175	175

Notes: Table A18 presents treatment effects for respondents who overestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of non-party members, Panel B contains the sample of party members. Outcomes and pre-specified controls are as defined in Table 2.

Table A19: Treatment effects by party membership duration (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Below med. membership dur.									
Treatment	-20.156*** (2.538)	-0.112* (0.067)	-1.287 (1.332)	-0.017 (0.051)	-0.189 (0.228)	-16.278 (15.984)	-0.167 (0.103)	0.013 (0.057)	-2.027 (3.915)
Control mean	46.313	0.590	6.108	0.169	0.518	27.675	0.104	0.108	5.711
Observations	160	160	160	161	161	161	160	161	161
Panel B: Above med. membership dur.									
Treatment	-10.188*** (3.044)	-0.027 (0.099)	0.934 (2.787)	-0.034 (0.055)	-0.001 (0.240)	2.230 (9.935)	-0.003 (0.160)	-0.023 (0.091)	-1.467 (5.715)
Control mean	43.686	0.471	5.176	0.118	0.314	14.118	-0.079	0.137	9.510
Observations	87	87	87	87	87	87	87	87	87

Notes: Table A19 presents treatment effects for respondents who overestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters that have a below median party membership duration (including non-members), Panel B contains the sample of supporters who have above median membership duration. Outcomes and pre-specified controls are as defined in Table 2.

Table A20: Treatment effects by application download (overestimators)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No app download									
Treatment	-16.408*** (2.350)	-0.111 (0.069)	-1.019 (1.295)	-0.006 (0.032)	-0.022 (0.067)	-1.429 (2.086)	-0.106 (0.082)	-0.005 (0.022)	0.198 (0.312)
Control mean	45.432	0.421	3.737	0.032	0.074	2.105	-0.270	0.021	0.095
Observations	172	172	172	173	173	173	172	173	173
Panel B: App download									
Treatment	-15.388*** (3.552)	0.011 (0.088)	0.438 (3.329)	-0.032 (0.112)	-0.250 (0.604)	-22.830 (39.036)	-0.069 (0.247)	0.025 (0.184)	-10.017 (16.135)
Control mean	45.026	0.846	10.667	0.436	1.333	72.231	0.775	0.359	24.359
Observations	75	75	75	75	75	75	75	75	75

Notes: Table A20 presents treatment effects for respondents who overestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters who had not downloaded the application before the treatment, Panel B contains the sample of supporters who had downloaded the application before the treatment. Outcomes and pre-specified controls are as defined in Table 2.

Results without pre-specified controls

Table A21: Main effects (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	4.982*** (0.547)	0.013 (0.030)	-1.081*** (0.390)	-0.009 (0.019)	-0.166 (0.168)	-14.784* (8.456)	-0.082 (0.057)	-0.144** (0.067)	-6.764** (2.944)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table A21 presents treatment effects without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Outcomes are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A22: Treatment effects and strength of connection to the party (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	4.857*** (0.563)	0.014 (0.029)	-1.131*** (0.397)	-0.008 (0.019)	-0.174 (0.167)	-16.116* (8.667)	-0.087 (0.058)	-0.147** (0.066)	-7.155** (2.992)
Treatment × Strength of connection to party (PCA)	0.769 (0.666)	0.035 (0.030)	0.833** (0.380)	0.002 (0.015)	0.141 (0.153)	16.600** (7.314)	0.097* (0.051)	0.059 (0.066)	5.336** (2.364)
Strength of connection to party (PCA)	-1.423*** (0.504)	0.034 (0.021)	-0.225 (0.334)	0.006 (0.012)	-0.041 (0.139)	-10.916* (6.563)	-0.011 (0.043)	-0.017 (0.063)	-2.883 (2.116)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table A22 presents treatment effects interacted with a summary measure of connectedness to the party without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. The measure for strength of connection to the party is the first principal component of three pre-specified dimensions of heterogeneity (previous canvassing experience, party membership and party membership duration) obtained from a principal component analysis. This summary measure is standardized to have mean zero and standard deviation one. Outcomes are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A23: Treatment effects and career concerns (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Treatment	4.961*** (0.550)	0.011 (0.030)	-1.108*** (0.391)	-0.010 (0.019)	-0.176 (0.169)	-15.632* (8.556)	-0.088 (0.057)	-0.149** (0.067)	-7.031** (2.974)
Treatment × Predicted career concerns	-0.626 (0.546)	-0.039 (0.030)	-0.759* (0.388)	0.004 (0.018)	-0.122 (0.145)	-15.948** (7.334)	-0.088* (0.053)	-0.107** (0.052)	-5.941*** (2.242)
Predicted career concerns	0.468 (0.338)	0.042** (0.021)	0.684** (0.330)	0.034*** (0.013)	0.229** (0.098)	20.431*** (5.699)	0.136*** (0.039)	0.115*** (0.042)	6.512*** (1.809)
Control mean	9.083	0.473	4.028	0.123	0.701	38.348	-0.029	0.297	13.318
Observations	1150	1148	1148	1163	1163	1163	1148	1163	1163

Notes: Table A23 presents treatment effects interacted with a supporter’s career concerns without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. We do not directly observe career concerns for participants in our experiment. We therefore predict career concerns using a post-election survey administered two months after the election to the same population of party supporters (excluding individuals who participated in the main experiment). Career concerns are measured as choosing “It is possible” as an answer to at least one the following questions “Can you imagine yourself taking on a political position within the party?” and “Can you imagine yourself running for office for this party?” (the answer options were “No”, “It is possible”, and “I am already doing this”). We use a post-LASSO algorithm to predict career concerns for our experimental sample based on pre-determined covariates (Belloni and Chernozhukov, 2013). The predicted variable is standardized to have mean zero and standard deviation one. The results of the post-LASSO regression are displayed in Table A8. Outcomes are as defined in Table 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A24: IV estimates: post-treatment beliefs and effort choices (no controls)

	Intentions		App Data			Index	App: Week 7/8	
	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Main Effect (IV)								
Posterior	0.003 (0.006)	-0.218*** (0.083)	-0.002 (0.004)	-0.033 (0.034)	-2.971* (1.760)	-0.017 (0.012)	-0.029** (0.014)	-1.364** (0.619)
Observations	1148	1148	1163	1163	1163	1148	1163	1163
Panel B: Weak connection to party (IV)								
Posterior	-0.002 (0.009)	-0.350** (0.142)	-0.001 (0.006)	-0.066 (0.051)	-5.788** (2.921)	-0.031* (0.019)	-0.043** (0.022)	-2.438** (1.013)
Observations	547	547	554	554	554	547	554	554
Panel C: Strong connection to party (IV)								
Posterior	0.007 (0.008)	-0.109 (0.103)	-0.003 (0.005)	-0.006 (0.047)	-0.665 (2.234)	-0.004 (0.015)	-0.017 (0.019)	-0.483 (0.805)
Observations	601	601	609	609	609	601	609	609
Panel D: Low career concerns (IV)								
Posterior	0.010 (0.008)	-0.061 (0.106)	-0.001 (0.005)	0.006 (0.040)	0.703 (1.476)	0.004 (0.013)	0.004 (0.016)	0.219 (0.595)
Observations	547	547	554	554	554	547	554	554
Panel E: High career concerns (IV)								
Posterior	-0.005 (0.009)	-0.382*** (0.134)	-0.002 (0.006)	-0.074 (0.058)	-6.857** (3.410)	-0.038* (0.020)	-0.064** (0.025)	-3.036** (1.184)
Observations	601	601	609	609	609	601	609	609

Notes: Table A24 presents IV estimates for the impact of post-treatment beliefs without pre-specified controls for all underestimators (Panel A). Post-treatment beliefs are instrumented with the treatment indicator. Parallel to Table 5, Panels (B) and (C) distinguish between supporters with weak and strong connections to the party, whereas panels (D) and (E) distinguish between supporters with low and high career concerns. Outcomes are as defined in Table 2.

Table A25: Treatment effects on application download (no controls)

	Survey	App Data		
	click on app-link	within 24h	within one week	any time after survey
Treatment	-0.009 (0.011)	0.004 (0.008)	-0.006 (0.009)	0.009 (0.014)
Observations	1163	1163	1163	1163
Control group mean	0.04	0.02	0.03	0.05

Notes: Table A25 presents treatment effects on application download without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign.

Table A26: Treatment effects by canvassing experience (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Inexperienced supporters									
Treatment	4.641*** (0.736)	0.002 (0.037)	-1.259*** (0.482)	0.001 (0.023)	-0.258 (0.190)	-23.253** (10.407)	-0.111 (0.070)	-0.190** (0.082)	-10.656*** (3.679)
Control mean	9.872	0.376	3.382	0.101	0.657	39.110	-0.126	0.300	14.187
Observations	701	700	700	710	710	710	700	710	710
Panel B: Experienced supporters									
Treatment	5.517*** (0.794)	0.029 (0.045)	-0.810 (0.642)	-0.023 (0.033)	-0.021 (0.312)	-1.482 (14.327)	-0.037 (0.096)	-0.072 (0.114)	-0.656 (4.883)
Control mean	7.850	0.626	5.041	0.158	0.770	37.158	0.122	0.293	11.959
Observations	449	448	448	453	453	453	448	453	453

Notes: Table A26 presents treatment effects without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party’s door-to-door canvassing campaign. Panel A contains the sample of supporters without previous canvassing experience, Panel B contains the sample of supporters with previous canvassing experience. Outcomes are as defined in Table 2.

Table A27: Treatment effects by party membership (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No party member									
Treatment	5.025*** (0.607)	0.010 (0.033)	-1.082** (0.420)	-0.021 (0.021)	-0.317* (0.178)	-17.831** (8.819)	-0.113* (0.061)	-0.175** (0.077)	-7.713** (3.342)
Control mean	8.658	0.473	3.950	0.126	0.724	35.719	-0.033	0.308	13.519
Observations	910	908	908	920	920	920	908	920	920
Panel B: Party member									
Treatment	4.953*** (1.229)	0.025 (0.065)	-1.049 (0.976)	0.038 (0.044)	0.429 (0.454)	-1.564 (23.001)	0.044 (0.146)	-0.023 (0.135)	-3.059 (6.342)
Control mean	10.623	0.475	4.311	0.113	0.621	47.782	-0.016	0.258	12.597
Observations	240	240	240	243	243	243	240	243	243

Notes: Table A27 presents treatment effects without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of non-party members, Panel B contains the sample of party members. Outcomes are as defined in Table 2.

Table A28: Treatment effects by party membership duration (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: Below med. membership dur.									
Treatment	4.697*** (0.816)	-0.022 (0.042)	-1.687*** (0.580)	0.003 (0.029)	-0.187 (0.248)	-23.340* (14.146)	-0.133 (0.088)	-0.202** (0.093)	-10.191** (4.557)
Control mean	9.900	0.523	4.674	0.141	0.827	52.676	0.076	0.363	17.359
Observations	575	574	574	582	582	582	574	582	582
Panel B: Above med. membership dur.									
Treatment	5.248*** (0.728)	0.047 (0.042)	-0.485 (0.520)	-0.021 (0.024)	-0.146 (0.226)	-6.317 (9.210)	-0.033 (0.072)	-0.086 (0.095)	-3.355 (3.726)
Control mean	8.278	0.424	3.392	0.105	0.575	24.070	-0.133	0.232	9.291
Observations	575	574	574	581	581	581	574	581	581

Notes: Table A28 presents treatment effects without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of supporters who have a below median party membership duration (including non-members), Panel B contains the sample of supporters who have above median membership duration. Outcomes are as defined in Table 2.

Table A29: Treatment effects by application download (no controls)

	Posterior	Intentions		App Data			Index	App: Week 7/8	
	Belief	Any	Days	Any	Days	Door	Overall	Days	Doors
Panel A: No app download									
Treatment	4.238*** (0.669)	0.011 (0.033)	-0.719* (0.415)	-0.002 (0.011)	-0.142 (0.095)	-8.305* (4.548)	-0.051 (0.040)	-0.091* (0.050)	-3.107* (1.715)
Control mean	9.438	0.366	2.908	0.026	0.206	10.848	-0.304	0.114	4.241
Observations	844	842	842	855	855	855	842	855	855
Panel B: App download									
Treatment	7.042*** (0.882)	-0.038 (0.048)	-2.589*** (0.854)	-0.071 (0.056)	-0.463 (0.546)	-44.511 (28.324)	-0.307* (0.158)	-0.366* (0.205)	-20.459** (9.929)
Control mean	8.000	0.799	7.439	0.418	2.206	121.823	0.808	0.851	40.872
Observations	306	306	306	308	308	308	306	308	308

Notes: Table A29 presents treatment effects without pre-specified controls for respondents who underestimate the share of fellow party members who plan to participate in the party's door-to-door canvassing campaign. Panel A contains the sample of supporters who had not downloaded the application before the treatment, Panel B contains the sample of supporters who had downloaded the application before the treatment. Outcomes are as defined in Table 2.