The Link between Partisan Voting and Polarized Social Identity

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Word count: 949

Tuesday 30th May, 2017

Abstract

While scholars and pundits alike have pointed to increasing partisan affect in the US, there has been little analysis as to how partisan affect impacts voting. Formally, we show that affective polarization may influence voting through an expressive channel, as voters become more likely to vote instinctively, and through an instrumental channel, as voters expect candidates to take decisions that are favorable towards their partisan in-groups. We conduct a laboratory experiment designed to distinguish between the two channels and find that both influence voting. The instrumental impact, however, depends on the degree of polarization in policy preferences. Importantly, our results confirm that affective polarization decreases the electoral prospects of high valence candidates, as voters become more likely to choose based on identity rather than ability.

Keywords: Political polarization, social identity, affective polarization.

[*]Thanks to Charlotte Cavaille, Steffen Huck, Rachel Kranton, Anselm Rink, Arturas Rozenas, and Paul Seabright for their valuable comments and suggestions. Support through the ANR - Labex IAST and WZB Berlin is also gratefully acknowledged.

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1 Introduction

Following the recent presidential election in the US, pundits and academics alike have expressed concern that American politics has entered a new era of partisan tribalism. While partisan identity has long been the strongest predictor of American political behavior (Green, Palmquist and Schickler, 2004), the increasing correlation between partisan identity and demographic characteristics, combined with the informational bias caused by individualized media "echo chambers," point to a new level of polarization in partisan politics. In fact, existing research has indicated that partisan political identity is increasingly taking on a social dimension, resulting in an in-group/out-group mentality that is comparable in strength to racial identity (see Greene, 2004, Iyengar and Westwood, 2015 and Mason, 2015). However, so far there has been little analysis as to how this divergence of affect towards partisan in-group and out-group individuals impacts citizens' most fundamental political decision in a representative democracy: their decision on how to cast their ballot.

In this paper, we investigate the impact of affective polarization on partisan voting.[1] We hypothesize that affective polarization influences voting through an expressive channel, as voters become more likely to vote instinctively, and that it effects voters' instrumental motivations as well since voters anticipate that candidates will display a partisan bias once in office.[2] That is, in a setting where partisan groups systematically differ in their underlying political preferences and values (as is the case in the US), from an instrumental perspective, voters may condition their vote on partisan identity because they expect candidates to choose policies that are in line with the preferences of their partisan in-group. Our research shows that both channels may have a causal impact on citizens' voting decision. Importantly, while expressive partisan voting appears to be driven by the intensity of partisan affect, instrumental partisan voting depends on the degree of divergence in voters' preferences over the underlying policy space – a rational response given that candidates respond to an increase in the divergence of policy preferences

[1] Following Iyengar and Westwood (2015, 691), we use affective polarization to refer to "... the tendency of people identifying as Republicans or Democrats to view opposing partisans negatively and co-partisans positively." Affective polarization may of course also impact other areas of political behavior; e.g. for an important contribution on the expressive impact of affective (or social) polarization on political activism, see Huddy, Mason and Aarøe (2015).

[2] To clarify on our use of instrumental and expressive, we use "instrumental" to refer to material incentives, while we use "expressive" to refer to non-material incentives (e.g., an emotional utility for casting a vote for the in-group candidate).

by adopting more extreme policy positions. Taken together, this implies that while partisan affect always has a detrimental influence on political selection since it shifts attention away from the candidates' ability, the impact of affective polarization on partisan voting will be the most severe in political environments that feature both high partisan affect and a high degree of polarization of policy preferences.

To guide our thinking, we develop a formal theory that incorporates a group identity model into a simple model of Downsian political competition. In contrast to Dickson and Scheve (2006), who analyze a model of identity and political competition where identity corresponds to a positive payoff from voting for a co-identity candidate (following the identity model of Akerlof and Kranton, 2000), we focus on the case where group identity causes agents to place a higher relative weight on the payoffs of in-group agents (following the group identity model of Charness, Rigotti and Rustichini, 2007).[3]

In our model, citizens choose between two candidates via majority rule. Each candidate is characterized by membership in one of two identity-groups and by a valence term (ability). Additionally, conditional on being elected, the candidate makes an ex-post policy choice in a three-point policy space. Since candidates only receive benefits from holding office, their choice of policy is a function of their preferences over citizens' payoffs: Candidates can choose a centrist policy to maximize aggregate payoffs or an extreme policy to favor a particular partisan group. Citizens' payoffs are a function of both the winning candidate's ability and the policy this candidate sets when in office. Importantly, citizens' policy preferences are partisan, in the sense that a citizen's partisan identity is correlated with the location of their ideal point in the policy space. Therefore, while all citizens prefer a candidate with a higher valence ceteris paribus, instrumentally they will favor the co-partisan candidate to the extent that they expect candidates to select a partisan policy.

Our model predicts that partisan voting is a function of affective polarization – affective polarization implies that candidates will choose partisan policy, which gives voters an incentive to vote for their co-partisan candidate. This finding, however, is insufficient to identify an instrumental link between affective polarization and socially-inefficient partisan voting. A baseline level of partisan voting could be sustained based on purely expressive grounds: Partisan cues may elicit an emotional response that causes some agents to vote against a higher-valence

[3]Our model and experimental design, however, also account for an expressive payoff for voting for the in-group candidate

candidate from the out-group.[4] Therefore, to identify the instrumental link we rely on our model's prediction that the degree to which affective preferences influence voting behavior is a function of the magnitude of policy polarization. Intuitively, when preference polarization is low, citizens will expect the candidates to adopt a centrist policy if elected and hence have a dominant incentive to vote for the higher-valence candidate. As policy preferences become more polarized citizens will expect candidates to take partisan policy positions to cater to the interests of their in-group, in which case partisan identity becomes the dominant incentive when selecting between the candidates. Since expressive motives to vote for the co-partisan candidate are not conditional on the underlying degree of policy polarization, the prediction of a positive correlation between policy polarization and partisan voting provides a clear test of the existence of an instrumental impact of group identity.

The laboratory experiment we implement mirrors the formal model: subjects are divided into two identity groups and one subject from each group is selected to be a candidate – subjects then cast votes between pairs of candidates knowing only the candidates' group membership and assigned ability. Subjects receive payoffs that are based on the policy selected by the winning candidate, and therefore have an instrumental incentive to condition their vote on their belief regarding the candidates' partisan bias. Given that we induce policy preferences and a universal preference for candidate ability using monetary incentives, we are able to identify partisan voting by measuring the degree to which subjects trade off between the candidates' ability and their identity. Additionally, to test the model's prediction regarding partisan voting and polarization in policy preferences, we vary the probability that a citizen is assigned an ideal point in the partisan extreme. Since we do not assign affective preferences directly, we are unable to explicitly control the level of affective polarization. However, we vary whether subjects are assigned to groups randomly (i.e., a minimal group design) or based on a natural identity (e.g., partisan identity) to create variation in the intensity of in-group affect.

Experimentally, we find that subjects express a willingness to vote for a candidate within their identity group, even when this candidate has a relatively lower degree of valence. On average, subjects vote for their co-partisan candidate roughly 80 percent of the time overall, and 45 percent of the time when the co-partisan candidate has a lower ability. Importantly, we also find a positive relationship between polarization in policy preferences and partisan voting,

[4]Several experimental studies have focused on detailing the extent of expressive voting in a laboratory setting; see Tyran and Wagner (Forthcoming) for a review.

which allows us to conclude that in-group voting is more than just an expressive phenomena – the response in voting behavior to the underlying degree of polarization in citizens' policy preferences suggests a sensitivity of citizens to their beliefs regarding the degree of in-group favoritism displayed by the candidates.

In turn, given the actions of the candidates, this increase in partisan voting in response to the underlying degree of policy polarization is perfectly rational. As predicted by the group-identity model, we find that candidates show a higher degree of partisan bias when policy polarization is high – this pattern of bias is especially striking given that, for all allocation choices, aggregate welfare is maximized with a purely centrist policy. Our data show that, on average, when compared to the voting behavior that would maximize individual payoffs, partisan voting is too low for high degrees of policy polarization, and too high for low degrees of policy polarization. Moreover, the pattern of behavior shows that partisan voting is not purely driven by a subset of voters who always vote along partisan lines: only 14 percent of voters vote for their co-partisan candidate when the cost (in ability difference) is high and policy polarization is low, while 61 percent vote for their co-partisan candidate when the cost is low and policy polarization is high.

While the model and experiment are stylized settings, they capture salient features of political competition that are affected by social identities and polarization. Ex post policy discretion implies that citizens face uncertainty regarding which policies the candidates will select once in office. In such a setting, citizens look for cues that signal candidates' preferences, and are hence useful for predicting the candidates' policy choices. In the absence of identity cues, citizens might expect all candidates to maximize aggregate welfare and choose a centrist policy. In a setting with identity division, however, the group identity model predicts that candidates will favor policy positions that disproportionately benefit the in-group. This implies that citizens will interpret identity cues as a signal that the co-partisan candidate will select policies that are consistent with the political values and norms of the group, and hence rationally respond to these cues by voting in a partisan manner. The laboratory allows us to create counterfactuals to clearly unpack the mechanisms by which affective polarization impacts experimental subjects' voting decision. By comparing treatments where partisan identity is generated using a neutral prime (minimal groups) with treatments where subjects are sorted into groups using a natural identity, we are able to provide data on how behavior changes as we move from an artificial choice environment towards a more natural setting.

We see, however, no treatment effect of more natural identities on partisan voting. One reason for the lack of an increase in partisan voting may be that the use of a natural identity triggers a social norm against discrimination that is absent when group membership is randomly assigned. In fact, we find that using a non-political natural identity in a sample of German university students results in a slight decrease in partisan voting when compared to minimal groups, despite the fact that we utilize a real-world identity that students list as being more important than political identity. Even accounting for this potential downward bias, the difference in partisan voting between the minimal group and endogenous sorting into political identities remains small (we do find some evidence for a stronger effect among students who describe themselves as "Strong Democrat/Republican" in a sample of American university students). Therefore, a potentially important implication of this finding is that, among a group of individuals that are otherwise relatively homogeneous (university students), the impact of partisan identity is not much greater than that of an arbitrary label.[5]

Social Identity, Partisanship, and Polarization

The approach we use here to study the impact of partisan affect on voting behavior is inspired by the seminal work on social identity theory by Tajfel and Turner (1979), and the large subsequent body of work within social psychology, political science, and economics that has examined the impact of group identity on behavior (see Chen and Li, 2009 and Huddy, Mason and Aarøe, 2015 for a detailed overview). This literature has established a seemingly natural proclivity of individuals to let their behavior be influenced by even the most minimal of group labels. Such group markers influence voting behavior in many ways, explained by general warm-glow in-group favoritism, group equality concerns, or reciprocity (Tajfel, 1981; Andreoni, 1989; Bernhard, Fehr and Fischbacher, 2006; Chen and Li, 2009), emotional gains by conforming to group norms (Akerlof and Kranton, 2000, 2010; Dickson and Scheve, 2006), and by group status considerations (Shayo, 2009; Klor and Shayo, 2010). Applied to elections, behavior resulting from these motivations is usually labeled "expressive voting" because it is not driven by the benefits from electoral outcomes but the act of voting for in-group candidate induces positive utility itself (Tyran, 2004; Hillman, 2010; Hamlin and Jennings, 2011).

[5]One caveat is that the student body at the university where we conduct this study, Florida State University, is roughly evenly split between Democrat/Republican – it is possible, either due to selection or socialization, that party identity has a greater impact at universities with a more politically-homogeneous student body.

In a setting where identity is correlated with policy preferences, the group identity model predicts that candidates will favor policy positions that disproportionately benefit the in-group. This implies that citizens will interpret identity cues as a signal that the co-partisan candidate will select policies that are consistent with the political values and norms of the group, and hence rationally respond to these cues by voting in a partisan manner. Therefore, even if expressive voting may feature prominently in linking social identity and vote choice, shared group membership provides low-cost informational cues (Lupia and McCubbins, 1998, 2000; Chandra, 2004), cues that are more relevant if voters are otherwise less informed (Morton, Williams and Bassi, 2011). One interpretation of the informational role of such cues is that shared social identity implies the expectation of shared interests and allows voting to be driven by instrumental motivations.

No matter whether we conceptualize partisanship as manifestation of other group affiliations (Campbell et al., 1960) or as social identity in its own right (Green, Palmquist and Schickler, 2004; Greene, 1999; Huddy, Mason and Aarøe, 2015; Iyengar, Sood and Lelkes, 2012), the prominence of partisanship is increasing in polarization of political parties (Fiorina and Abrams, 2008; Hetherington, 2009) and the public (Abramowitz and Saunders, 2008; Bafumi and Shapiro, 2009; Baldassarri and Gelman, 2008). Whether Americans may be simply centrist but provide polarized evaluations of polarized politicians (Lupton, Myers and Thornton, 2015), because elite polarization induce citizens to form political opinions with less reflection (Druckman, Peterson and Slothuus, 2013), or affective polarization of the electorate has increased (Iyengar and Westwood, 2015; Iyengar, Sood and Lelkes, 2012) driving polarized political attitudes and behaviors, however, is not fully settled. Our study identifies the links between polarization and both expressive and instrumental partisan voting and shows that affective polarization has a clear negative impact on social welfare by decreasing the likelihood that high valence candidates win elections.

2 Model of Affective Polarization and Political Behavior

Here we introduce a simple formal structure that reflects our experimental design, and allows us to detail the interactions between affective polarization, polarization in policy preferences, and partisan political behavior. While the model informs our experimental strategy for separately identifying the expressive and instrumental impact of affective polarization on partisan voting,

readers may also skip straight to Section 2.2 for an overview of the theoretical findings.

AGENTS: There are n agents, denoted by the index set $N = \{1, ..., n\}$, with n even and greater than two. Agents either belong to (identity) group A or group B. Abusing notation, we define group membership from the perspective of agent i when convenient; that is, i is a member of the in-group, denoted by set $I = \{j | j \in A \text{ if } i \in A \text{ else } j \in B\}$, while all other agents, j, are either in I or the out-group, denoted by set $I^- = N \backslash I$. Each identity group has an equal number of agents ($|A| = |B|$).

ACTIONS AND PAYOFFS: One agent in each group is a candidate; we denote these individuals by c^A and c^B. In addition to group membership, each candidate is endowed with a valence term, or ability, denoted by α^A and α^B. Candidates receive payoffs of x^w if they win the election and x^l if they lose the election, where $x^l < x^w$ (note that candidates only receive payoffs from holding office). After the election, the winning candidate implements a vector of policy choices, $\mathbf{p} = (p_l, p_m, p_r)$, over an ordered three-point policy space $\{l, m, r\}$. Each policy choice is represented by $p_k \in [0, 1]$ and available policy choices are constrained to the set of $\mathbf{p}$ that satisfy $p_l + p_m + p_r \leq 1$.

Agents who are not candidates are voters and, after observing the candidates' group membership and abilities, submit a vote, v_i, for c^A or c^B (no abstention). The winner is chosen by majority rule, and the winner affects voters' payoffs through the following two channels:

1. [Policy] voter i's payoffs are a function of the policy choice of the winning candidate, $\mathbf{p}^w$, and the citizen's ideal point $p_i \in \{l, m, r\}$.
2. [Valence] voter i's payoffs are strictly increasing in the winning candidate's ability, α^w.

Formally, citizen payoffs are as follows:

$$x_i = \alpha^w + v(\mathbf{p}^w, p_i), \tag{1}$$

where p_i is the ideal point of citizen i.

Since we are considering a discrete policy space, we characterize policy payoffs a simple linear function of the ideal point and the amount allocated to each p_k:

$$v(\mathbf{p}^w, p_i) = \sum^{k} v_k(p_k, p_i), \tag{2}$$

where:

$$v_k(p_k, p_i) = \begin{cases} p_k & \text{if } k = p_i, \\ \frac{1}{2}p_k & \text{if } k, p_i \text{ contiguous}, \\ 0 & \text{if } k, p_i \text{ non-contiguous}. \end{cases}$$

That is, citizens receive 1 unit of payoff for every unit of p_k placed at their ideal point, and 1/2 units of payoff for every unit of p_k placed at a point contiguous to their ideal point.

Consistent with our motivation, we are concerned with the case where policy is partisan, in the sense that policy preferences are correlated with identity. For simplicity, we consider the case in which policy preferences are stochastic: citizens' ideal points are unknown prior to the election, but the distribution from which ideal points are drawn is common knowledge. Formally, for $i \in A$, p_i is drawn from $\{l, m\}$ and for $i \in B$, p_i is drawn from $\{m, r\}$. Additionally:

$$\Pr(p_i = l | i \in A) = \Pr(p_i = r | i \in B) = q. \tag{3}$$

This structure implies that each citizen in group A (B) has the same *expected* policy position (ex ante symmetry). The assumption of stochastic policy preferences is not substantive with respect to the formal model; however, it simplifies the experimental analysis substantially, since group membership correlates perfectly with expected policy preferences. Moreover, q provides a measure of the polarization of citizens' policy preferences, where $q = 1$ corresponds to perfect polarization in policy preferences.

Utility: In addition to own payoffs, we consider the case where agents have distributional preferences and may receive expressive payoffs based on their actions. However, to simplify the analysis, we assume that distributional preferences are only relevant for the candidates, and that voting for the in-group candidate is the only action that generates an expressive payoff. (Including distributional preferences for voters and an expressive payoff for the candidate does not qualitatively change our results.) Accordingly, the utility function of voters takes the following form:

$$u_i^v(x_i, v_i, e_i) = x_i + e_i \mathbb{1}(v_i = c^I), \tag{4}$$

where e_i is the expressive payoff for voting for the ingroup candidate; e_i is heterogeneous and drawn from a uniform distribution, $U[0, \bar{e}]$ with $\bar{e} \geq 0$.

The utility function of the candidates is equal to:

$$u_i^c(x_i, \mathbf{x}^I, \mathbf{x}^{I^-}) = x_i + \delta g(\mathbf{x}^I, \mathbf{x}^{I^-}), \tag{5}$$

where $\mathbf{x}^I$ represents the set of payoffs of agents in group I and $g(\mathbf{x}^I, \mathbf{x}^{I^-})$ represents the agent's distributional preferences. Note that regardless of the weight agents place on their distributional preferences (δ), $g(\mathbf{x}^I, \mathbf{x}^{I^-})$ still plays a crucial role to the equilibrium of the model: since candidates do not receive policy payoffs, their choice of $\mathbf{p}^w$ is a function of their distributional preferences only.

Following the literature on minimal groups in social psychology, Charness, Rigotti and Rustichini (2007); Chen and Li (2009) document that even minimal group frames can significantly skew distributional preferences to favor payoffs for in-group members. As in Chen and Li, we formalize the group identity model by allowing for distributional preferences that are a function of group membership:

$$g(\mathbf{x}^I, \mathbf{x}^{I^-}) = \lambda \sum_{j \in I \setminus i} \sqrt{x_j} + (1-\lambda) \sum_{j \in I^-} \sqrt{x_j},^6 \tag{6}$$

where $\lambda \in [0.5, 1]$.

However, given that our aim is to test the impact of group identity, we must also define an appropriate benchmark for comparison. A natural candidate for distributional preferences is social efficiency: as highlighted in Charness and Rabin (2002), efficiency concerns can explain many experimental data. Therefore, we also consider a benchmark case of distributional preferences for ex ante efficiency:

$$g(\mathbf{x}^I, \mathbf{x}^{I^-}) = \sum_{j \neq i} \sqrt{x_j}. \tag{7}$$

In what follows, we will characterize the predictions under both the *Identity* and *Benchmark* (efficiency) models.

TIMING: The timing of the game is as follows

1. Candidates c^A, c^B are drawn and their abilities, $\{\alpha^A, \alpha^B\}$, are publicly revealed.

[6] To account for fairness considerations, we assume that distributional utility is a concave function of other's expected payoffs (see Fehr and Schmidt, 1999). The predictions of the model are qualitatively similar with linear utility.

2. Voters draw expressive payoffs, e_i, and simultaneously submit votes, v_i, for c^A or c^B.
3. The winning candidate (by simple majority) chooses $\mathbf{p}^w$.
4. Voter policy preferences, p_i, are drawn and payoffs, $\{x_i(p_i, \mathbf{p}^w, \alpha^w)\}$, realize.

Equilibrium and Welfare: The equilibrium concept is SPNE. That is, an equilibrium, $\{\mathbf{v}; \mathbf{p}^A, \mathbf{p}^B\}$, maximizes the candidates' distributional preferences and, given $\{\alpha^A, \alpha^B\}$ and $\{\mathbf{p}^A, \mathbf{p}^B\}$, v_i maximizes $E[u_i^v(x_i, v_i, e_i)|\alpha_w, \mathbf{p}_w]$ for each i. We impose the selection criteria that, when they are indifferent, candidates choose a centrist policy and citizens vote for their co-partisan candidate; these assumptions are for convenience only, and are not substantive.

We consider the welfare criterion of aggregate expected payoffs: i.e. the first-best solution maximizes aggregate expected payoffs, $\sum^N E[x_i]$.[7]

2.1 Analysis

We begin by characterizing the outcome that maximizes social efficiency.

Lemma 1 (Efficiency)

Social efficiency is maximized when candidates choose centrist policies, $\mathbf{p}^A = \mathbf{p}^B = \{0, 1, 0\}$, *and all citizens vote for the highest-valence candidate,* $v_i = c^k$ *for all* i *if and only if* $\alpha_k \geq \alpha_{k'}$.

First, note that a centrist policy maximizes aggregate expected payoffs for any q, since payoffs are "linear" in policy. Second, given that both candidates choose the same policy, efficiency is maximized by selecting the candidate with the highest valence (social efficiency is always neutral with respect to candidate payoffs). Formal proofs of all results can be found in the SI.

Candidates' policy choice: Following backward induction, we begin with the candidates choice of policy, $\{\mathbf{p}^A, \mathbf{p}^B\}$. Since candidates do not have access to commitment and do not choose policy until after they are elected, the chosen policy has no direct or indirect impact on the candidates' payoffs. Therefore, the winning candidate will choose $\mathbf{p}^w$ to maximize their distributional preferences.

The following propositions partially characterize the equilibrium choices of $\{\mathbf{p}^A, \mathbf{p}^B\}$ under the Benchmark and Identity models.

[7]For simplicity, we consider the welfare criterion of aggregate payoffs rather than aggregate utility, which would include expressive utility. However, the resulting first-best election and policy outcome would remain the same as long as $n|\alpha_k, \alpha_{k'}| > \bar{e}$.

Lemma 2 (Policy choices: Benchmark model)

If agents' distributional preferences are characterized by efficiency *then both candidates will choose centrist policies in equilibrium,* $\mathbf{p}^A = \mathbf{p}^B = \{0, 1, 0\}$.

Intuitively, Lemma 2 follows directly from Lemma 1.

Lemma 3 (Policy choices: Identity model)

If agents' distributional preferences are characterized by group identity*, then both candidates choose policies that are unique and weakly asymmetric, in the sense that* $p^l \geq p^r$ *for* $\mathbf{p}^A$ *and* $p^l \leq p^r$ *for* $\mathbf{p}^B$.

Lemma 3 stems from the inter-group conflict over the partisan policy space: Under the group identity model, candidates put a higher weight on the payoffs of their group members, and hence will take policy decisions that favor the partisan position of their group. That is, while under the Benchmark model the candidate's group identity is irrelevant and the only distinguishing characteristic is their relative valence, under the Identity model group identity is an important predictor of the decisions the candidates will take when in office.

The next result details the comparative statics of the candidates' policy positions in the Identity model, and will be key to our strategy for identifying the instrumental impact of affective polarization. However, instead of detailing the specific policy positions of the candidates, it will be more helpful to characterize the expected policy payoffs of the voters given the equilibrium policies $\{\mathbf{p}^A, \mathbf{p}^B\}$. Accordingly, we define Δ^x as the difference in expected policy payoffs between the two candidates for a voter with group identity I:

$$\Delta^x = E[x_i|\mathbf{p}^I] - E[x_i|\mathbf{p}^{I^-}]$$

Note that Δ^x is well-defined since the equilibrium policies of the candidates are unique.

This definition allows us to formulate the following proposition:

Proposition 1 (Comparative statics of the Identity model)

For $\lambda > 0.5$ *there exists* q^* *such that for* $q \geq q^*$, Δ^x *is strictly positive and* $\partial\Delta^x/\partial q$ *and* $\partial\Delta^x/\partial\lambda$ *are strictly greater than zero.*

The comparative statics of the model with respect to q are also illustrated in Figure 1. The positive relationship between the candidates' partisan policy-bias and polarization in policy preferences is due to the fact that as q increases, the marginal benefit of partisan policy to the

in-group increases, while the marginal cost of partisan policy to the out-group stays constant due to the linearity of payoffs.

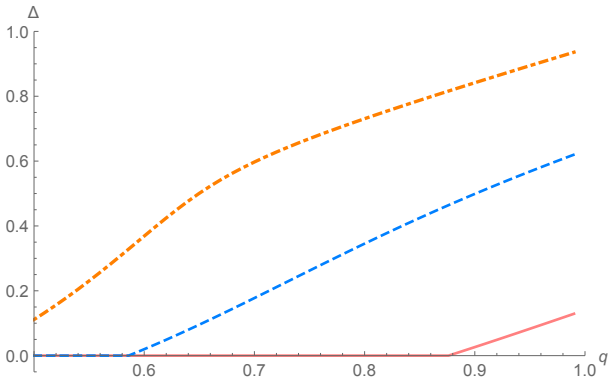


Figure 1: This graph shows the relative policy payoffs for electing the in-group candidate (Δ^x) as a function of the polarization in policy preferences (q), for different values of λ: 0.95 (orange, dot-dashed), 0.75 (blue, dashed), and 0.55 (red, solid).

Citizens' voting behavior:

Having detailed candidates' equilibrium behavior under the two different behavioral models, we turn to the main object of interest: citizens' voting decision. First, note that when their in-group candidate has a lower relative ability, voters may face a trade-off between voting expressively and voting instrumentally. In this case, the probability of influencing the outcome of the election becomes a relevant factor in the voting decision. Rather than explicitly considering the endogenous probability of being pivotal, we make the simplifying assumption that voters perceive their chances of influencing the outcome as invariant.

Assumption 1

Voters perceive their probability of being pivotal as constant and equal to $\bar{p}$.

While this assumption may be reasonable for large voting populations, it may bias the predictions of the model in small/medium groups. Therefore, we will directly account for this bias when generating predictions and comparing results across experimental treatments.

Take Δ^α to be equal to the relative ability of the *out-group* candidate:

$$\Delta^\alpha = \alpha^{I^-} - \alpha^I.$$

The following proposition characterizes voting behavior under the benchmark model.

Proposition 2 (Voting: Benchmark model)

If agents' distributional preferences are characterized by efficiency, *then citizens will vote for the in-group candidate if and only if:*

$$e_i \geq \bar{p}\Delta^{\alpha}. \tag{8}$$

Since the candidates will both choose a centrist policy, the citizen's voting decision becomes a simple calculus of comparing the expressive payoff for voting for the in-group candidate and the relative ability of the out-group candidate, weighed by the perceived probability of influencing the election outcome.

As implied by Lemma 3 and as illustrated in the following proposition, the voting calculus becomes more complicated when agents have distributional preferences that favor the in-group.

Proposition 3 (Voting: Identity model)

If agents' distributional preferences are characterized by group identity, *then citizens will vote for the in-group candidate if and only if:*

$$e_i + \bar{p}\big(E[x_i|\mathbf{p}^I] - E[x_i|\mathbf{p}^{I^-}]\big) \equiv e_i + \bar{p}\Delta^{x} \geq \bar{p}\Delta^{\alpha}. \tag{9}$$

Proposition 3 shows that, relative to the Benchmark model, the voting rule in the Identity model incorporates the perceived policy bias of the candidates, giving citizens an instrumental incentive to vote for their in-group candidate.

Next, we define $\tilde{\Delta}_i^{\alpha}$ as the maximum value of Δ^{α} such that voter i prefers to vote for the in-group candidate:

$$\tilde{\Delta}_i^{\alpha} = \begin{cases} e_i/\bar{p} & \text{under Benchmark model,} \\ e_i/\bar{p} + \Delta^{x} & \text{under Identity model.} \end{cases}$$

In the following corollary, we utilize this definition to compare the comparative statics of voting behavior under the Benchmark and Identity models.

Corollary 1 (Voting: comparative statics)

(i) Under the Benchmark model, $\tilde{\Delta}_i^{\alpha}$ is constant for all q.

(ii) Under the Identity model, $\tilde{\Delta}_i^{\alpha}$ is weakly increasing in q.

(iii) For $q = 0$, $\tilde{\Delta}_i^{\alpha} = e_i/\bar{p}$ under both the Benchmark and Identity models.

2.2 Summary of theoretical findings and identification strategy

While our model is a simplified setting, it captures features of political competition that are affected by social identities and polarization. Importantly, ex post policy discretion implies that citizens face uncertainty regarding which policy the candidates will select once in office. In such a setting, citizens look to cues that signal candidates' preferences, and hence are informative for predicting the candidates' policy choices. Absent cues, citizens might expect all candidates to maximize aggregate utility and choose a centrist policy. In a setting with identity division, however, the group identity model predicts that candidates will favor policy positions that disproportionately benefit the in-group. This implies that citizens will interpret identity cues as a signal that the co-partisan candidate will select policies that are consistent with the political values and norms of the group, and hence rationally respond to these cues by voting in a partisan manner.

The formal theory that we present in this section illustrates a novel insight regarding the relationship between affective and policy polarization. Namely, the impact of affective polarization on partisan voting is a function of the degree of underlying polarization in policy preferences (see Corollary 1 (ii)). Importantly, this relationship is driven by the instrumental impact of affective polarization: Intuitively, when policy preferences are homogeneous, there is little scope for choosing a policy that favors the in-group, and citizens will expect the candidates to take a centrist policy if elected. Therefore, citizens will prioritize the ability dimension when voting. As policy preferences polarize, however, citizens will expect candidates to take partisan policy positions. In this case, partisan identity becomes the dominant concern when selecting between the candidates.

In addition to characterizing the expressive and instrumental impact of partisan identity on citizens' voting decisions, the theory guides our experimental approach for empirically distinguishing between these two channels of influence: our identification strategy follows from the following two insights detailed in Corollary 1:

1. Given no policy preference polarization, in-group voting is driven solely by expressive motives.
2. Since expressive payoffs are constant, any increase in in-group voting as preference polarization increases is driven solely by instrumental motives.

First, (1) allows us to identify the level of expressive partisan voting by measuring the propor-

tion of individuals who vote for an in-group candidate with lower relative ability when policy preferences are not polarized. Second, (2) allows us to identify the level of instrumental partisan voting for any other degree of preference polarization by accounting for the level of expressive partisan voting identified in (1).

3 Experimental Design

Our experimental design mirrors the theoretical framework previewed above and features two stages.

The *group inducement stage* happens at the beginning of each session. In our *Baseline*-treatment, subjects are randomly assigned into one of two groups of equal size, "Group A" or "Group B," after they receive instructions for the voting game but before the voting game commences. We exogenously induce affective preferences over these groups by this standard minimal-group intervention because it has been shown to result in an in-group preference (Tajfel and Billig, 1974; Goette, Huffman and Meier, 2006; Chen and Li, 2009; Landa and Duell, 2015) but also precludes that group membership is systematically correlated with other subject characteristics. We discuss the *Bike* vs *Car*- and the *Dem* vs *Rep*-treatments, featuring endogenous sorting into groups based on natural identities, in Section 4.3.

The *voting game stage* implements the structure and payoffs as laid out in Section 2 and utilizes the strategy method. That is, each subject makes decisions in the role of a *candidate* and in the role of a *citizen* for all potential distributions of citizens' ideal points and all possible combinations of candidate abilities. Each subject faces decision situations in which polarization in citizens' policy preferences is absent (probability a citizen holds extreme preferences, q, is 0), some degree of polarization (probabilities of extreme preferences are .25, .5, or .75), or perfect polarization (probability a citizens holds extreme preference is 1). The ability of candidates is either low, medium, or high.

Identity groups correspond to citizen's ideal points in the three-point policy space; specifically, we precisely control the degree of polarization in citizens' policy preferences by changing the degree of correlation between citizens' group membership and their ideal policy points: in the case of no polarization in policy preferences, all citizens have ideal points at the center; in the case of perfect polarization, one group is located at the left while the other is at the right.

As candidates, subjects decide how to allocate up to 10 tokens to the three positions of

a preference space, *Left*, *Center*, or *Right*. As citizens, subjects make a choice between two candidates: Candidate A or Candidate B.

Again, the decision environment is characterized by the probability with which citizens are at the extreme (0, .25, .5, .75, 1); this probability is assigned without replacement to a block of 9 rounds for each subject. At the beginning of this block, subjects make their allocation decision in the role of a candidate and then make 9 voting decisions between the candidates while the ability of candidate varies. The order of decision blocks and of vote-pairings within the block is randomized; therefore, subjects face decision environments in different orders.[8] After the voting game, subjects also play one round of a dictator game and answer a questionnaire about basic demographics and the choices they made in the experiment.

In our experiment, subjects make decisions as candidate and citizen but we are mostly interested in citizen's choices. Acting as candidates, making an allocation decision in a given decision environment, helps subjects to form beliefs about what candidates may do, a belief that will then inform their choices as citizens. The behavior of citizens we approximate outside of the laboratory is characterized by exactly such uncertainty about what candidates are going to do once in office. Also, the implementation of how allocation decisions are made makes them a measure of in-group favoritism. Subjects allocation choices as candidate can not be directly motivated by re-election concerns because citizens do not learn about candidates' specific allocations. In this way, the allocation decision is an expression of subjects distributional preferences as modeled in Section 2.

3.1 Payoffs

Subjects are paid depending on their and other subjects' choices in one randomly chosen decision situation of the voting game (and their choices in the dictator game). One subject from each identity group is chosen to be a candidate and is assigned an ability and one distribution of citizens' ideal points, q, is selected. Next, the subjects actual voting decisions for this distribution and set of candidate abilities are used to determine the "winning" candidate: the candidate with the largest vote share is the winning candidate and receives 15 tokens; the loosing candidate receives 5 tokens. The winning candidate's token allocation determines the payoffs of the subjects not chosen as candidates. Each subject is assigned an ideal point equal to the partisan

[8] An exact overview over the decision environment for each round of the experiment can be found in Section C.1 in the SI.

extreme with probability q. Corresponding to the model, if assigned an extreme ideal point, A-citizens (B-citizens) receive 1 token for each 1 token allocated to Left (Right) and .5 tokens for each 1 token allocated to the Center. Subjects assigned an ideal point of Center receive 1 token for each token allocated to center, and .5 tokens for each token allocated to Right or Left. Additionally, all citizens receive 2 tokens if the winning candidate has a "low" ability, 3 tokens if "average" ability, and 5 tokens if "high" ability. Subjects received 5 Euro (7 Dollars) show-up fee plus the tokens they earned at an exchange rate of 60 cents for 1 token.

3.2 Identification and Hypothesis

In our experiment, subjects make decisions both as candidate and citizen. Since subjects cast votes for all candidate-ability pairs, relative candidate ability serves as measure of how subjects trade-off between the candidates' ability and their identity as a function of the underlying preference distribution. As detailed in the Theory section, the Identity Model predicts that from an instrumental perspective the subjects should favor the in-group candidate to the extent that they expect candidates to choose a partisan policy.[9] Therefore, our first hypothesis distinguishes between the Benchmark model, which predicts that citizens will always select the candidate with higher ability, and the Identity model, which predicts that citizens will favor their co-partisan candidate. Before stating the hypothesis, we first introduce the following term:

Definition 1 (Partisan Voting)

We define "Partisan Voting" as voting for the in-group candidate when the in-group candidate has a lower ability relative to the out-group candidate.

In other words, we only refer to voting for the in-group candidate as "partisan" when it is costly in ability terms.

Hypothesis 1 (No partisan voting)

Subjects will vote for whichever candidate has a higher level of ability (Benchmark vs Identity Model).

Falsifying this hypothesis, however, is not sufficient to identify whether partisan voting is due to expressive or instrumental concerns.

[9]For each distribution of ideal points, subjects take decisions as a candidate before taking decisions as a citizen. While it is possible that the act of choosing policies as a candidate affects subjects' beliefs over the actions of the other subjects (in their role as candidates), we kept the order constant to preserve comparability across subjects and rounds.

We measure the baseline level of expressive voting by eliciting subjects' votes between the candidates in a setting with no policy polarization. When all citizens have an ideal point at the center of the policy distribution ($q = 0$) then all citizens receive equal policy payoffs, regardless of the token allocation of the winning candidate. Therefore, the group identity model predicts that both candidates will choose equivalent policies, and citizens have no instrumental incentive to vote for their co-partisan candidate. This benchmark level of expressive voting is constant across the levels of policy polarization.[10] In accordance with the theoretical predictions, however, the level of instrumental partisan voting will increase with the level of policy polarization.

This gives us our second hypothesis:

Hypothesis 2 (Identifying Instrumental Voting)

The aggregate level of in-group voting is constant across ideal point distributions.

Note that our experiment is designed to precisely identify instrumental voting. For expressive voting, our measure represents an upper bound since, for example, subject errors may be classified as expressive voting.

Lastly, the identity model predicts that the level of partisan voting is an increasing function of the level of in-group affect (λ). In Section 4.3, we detail the results of several natural-identity treatments that are aimed to create variation in the level of affect across the identity groups:

Hypothesis 3 (Increasing Affect)

The aggregate level of in-group voting is constant across identity groups.

3.3 Session and summary statistics

In 7 sessions, with 24 subjects each (one with 26), we collect, for each subject, 45 observations as citizen and 5 observations as candidate. In total, we collect observations on 170 subjects with a total of 7650 citizen-round and 850 candidate-round observations. Given that subjects make decisions in the strategy method we have as many independent observations as subjects in the experiment. Subjects earning range from 7.7 to 20 Euro, average session earnings range from 12.9 to 18 Euros.[11] We ran 4 sessions in the laboratory at Technical University Berlin (2 sessions for the baseline treatment and 2 sessions for the *Bike* vs *Car*-treatment) and 3 sessions

[10] That is, our identifying assumption is that the level of expressive voting (and errors) is constant across ideal-point distributions. Also, as detailed in the Theory section, we assume that the probability of being pivotal is constant, or non-decreasing, in q – we show that this assumption holds in the following section.

[11] Table B.1 in the appendix provides an overview of these statistics.

in the laboratory at Florida State University (FSU; 1 session for the baseline treatment and 2 sessions for the *Dem* vs *Rep*-treatment).

For citizens, the variable of interest is their *voting decision*: their choice of either candidate A or B. For candidates, we record their *allocation decision* of, in sum, up to 10 tokens to the positions left, center, and right. *Decisions situation* are characterized by the probability of the citizen being positioned a the extreme (and not the center), a probability that is either 0, .25, .5, .75, or 1). Also, the two candidates citizens' face are assigned an *ability* of either low, medium, or high.[12]

4 Results

4.1 Partisan voting and policy preferences

We start our investigation by assessing the prevalence of partisan voting in the baseline treatment, where we induce group identities using a minimal group intervention. For this subsection, we report the results of the two sessions run in Berlin together with one session run at FSU.[13]

We begin by documenting subjects' behavior for decision situations in which the probability that citizens are located at the extreme position, q, is equal to one; that is, all A-citizens have an ideal point of Left and B-citizens have an ideal point of Right. This decision-environment maximizes the degree of policy conflict between the two groups, perfect polarization in policy preferences, and is equivalent to a zero-sum "divide the dollar" game. We find a strong bias among subjects to cast their vote for a candidate of their group: the average rate of in-group voting is .81 (.76,.85).[14] Specifically, we see that citizens overwhelmingly choose a candidate of their own group when this candidate is assigned the same or a higher ability than the candidate of the other group, as to be expected. When the own candidate is of lower ability than the other candidate, the in-group candidate is still preferred, that is, in more than 60% of the decisions

[12]Table B.2 in the appendix gives the summary statistics on *voting decision* and *allocation decision* by treatment.

[13]There is no difference in behavior between laboratories: it is $-.02\,(-.09, .05)$ in in-group voting, $-.01\,(-.16, .15)$ in partisan voting, $-.14\,(-.75, .46)$, and in allocations to the in-group. Also see regression model 1 in Table B.6 and B.7 in the SI.

[14]Here and throughout, we show 95%-confidence bound computed based on a subject-level clustered bootstrap. The results in this section are also robust to separating in-group voting by group membership, see Figure B.1 in the Appendix.

citizens engage in *partisan voting*. They elect the in-group candidate at an ability difference that amounts to a loss of 1 or 2 tokens and still in more than 40% of the decisions at a cost of 3 tokens. Figure 2 clearly demonstrates that the finding of partisan voting is independent of the difference in ability between a candidate who shares a group membership with citizens and those who do not.

Figure 2: Rate of in-group voting in the baseline treatment with perfect polarization in policy preferences by cost of ability difference

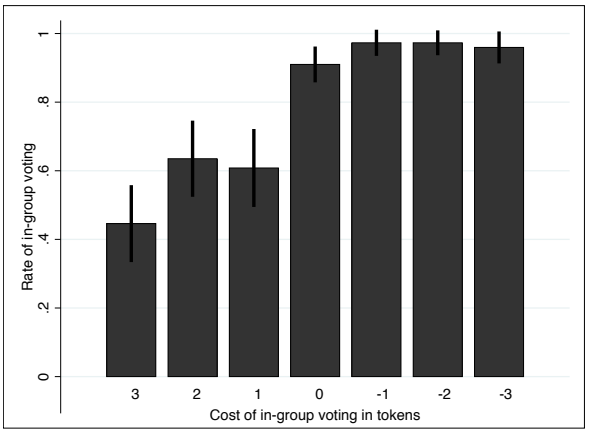
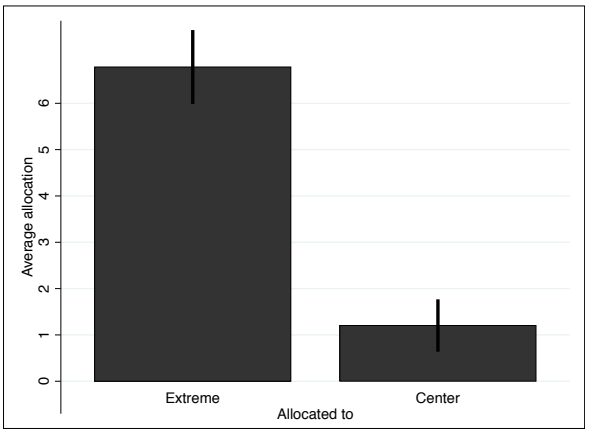


Figure 3: Allocation to partisan extreme (Left for Candidate A and Right for Candidate B) and center in the baseline treatment with perfect polarization in policy preferences



In summary,

Result 1 (Partisan voting)

subjects disproportionately vote for their co-partisan candidate even when there is a negative ability difference between in- and out-group candidates.

Result 1 leads us to reject the *no partisan voting hypothesis* by showing that subjects vote in accordance with the identity model, and are willing to vote for their co-partisan candidate, even when this candidate has a lower relative ability.

We also assess whether partisan voting is consistent with citizens' beliefs about what candidates are most likely to do or whether it is only psychologically sustained (i.e., in-group favoritism/out-group discrimination that is easily induced in the laboratory). Subjects' allocation choices as candidates are one measure of such beliefs. We define *partisan allocations* as candidate allocations to the extreme that have the potential, given the distribution of citizens, to favor in-group citizens: A-candidates who allocate tokens to Left and B-candidates who allocate tokens to Right whenever the probability that citizens are located at the extreme is higher than the one that they are located at the center. Candidates allocate heavily to the

position where their own groups' citizens are most likely to reside. They allocate on average, 5.54 (5.11, 5.97) tokens to the extreme (Left and Right) but only 2.30 (1.97, 2.62) to the Center. Figure 3 illustrates this in-group biased pattern.

Subjects show similar patterns of in-group favoring behavior as candidate and as citizen. Observing such in-group favoritism in form of partisan voting as well as partisan allocations could be interpreted as *expressive choice* but citizens in-group favoring vote choices may also simply reflect their expectations about candidates' behavior.

4.2 Is partisan voting an expressive or instrumental choice?

We established the existence of partisan voting at a level of policy preference polarization among citizens which would have called for no polarization assuming a rational agent; but is this finding enough to conclude behavior we induce is expressive? When partisan voting as well as partisan allocations vary with polarization in citizens' policy preferences in similar ways, what seems to be group biased behavior cannot be exclusively called an expressive choice. In the experiment, we vary the probability with which citizens are located at the extreme of the policy space (Left for A-citizens and Right for B-citizens) from all citizens in the Center (probability 0) – no polarization in policy preferences – to all A-citizens located Left and all B-citizens located Right (probability 1) – perfect polarization in policy preferences. Figure 4 demonstrate an increase in partisan voting with increasing polarization in policy preferences.

Figure 4: Rate of partisan voting in the baseline treatment by policy preference polarization

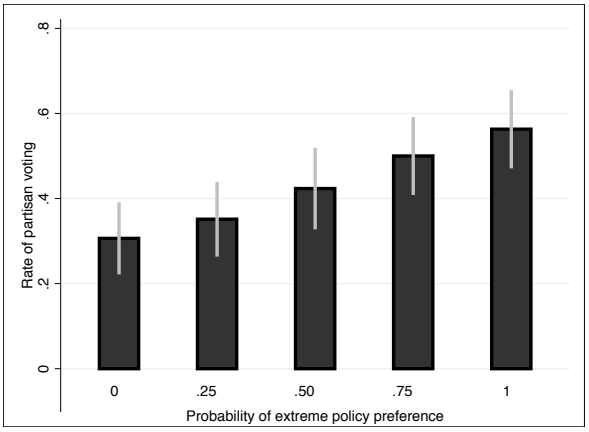
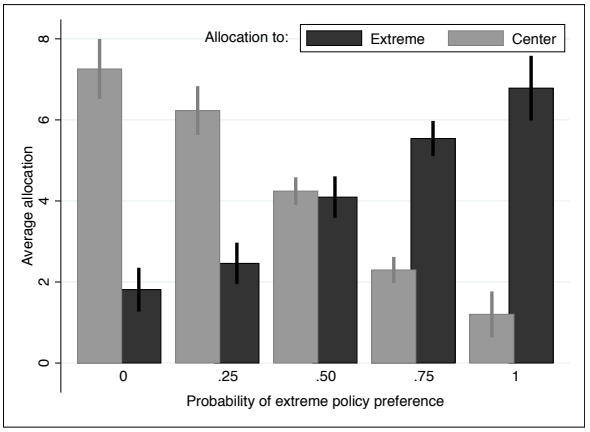


Figure 5: Allocation to the partisan extreme (Left for Candidate A and Right for Candidate B) and center in the baseline treatment by policy preference polarization



In particular, citizens choose their in-group candidate when all citizens are located at the center with probability 1. When the probability that citizens are located at the extreme is 1, however, citizens pick the in-group candidate at a rate of .56 (.46,.66). The marginal effect of increasing the probability of citizens being located at the extreme positions by .25, increases citizens' propensity for a partisan vote by 6.6 (4.2,9.0) %.[15]

The following result summarizes these findings:

Result 2 (Instrumental partisan voting)

The aggregate level of partisan voting is increasing in the level of polarization of citizens' assigned policy preferences (q).

This result confirms our main hypothesis (Hypothesis 2 – Identifying Instrumental Voting) and shows that subjects instrumentally respond to the candidates' biased policy choices.

Partisan voting for the case of no polarization in policy preferences ($q = 0$) provides a benchmark of the level of expressive partisan voting – as seen in Figure 4, comparing the cases of no polarization in policy preferences ($q = 0$) and perfect polarization in policy preferences ($q = 1$), the level of socially-costly partisan voting increases by over 70 percent – an increase that can be attributed to the instrumental impact of affective polarization.

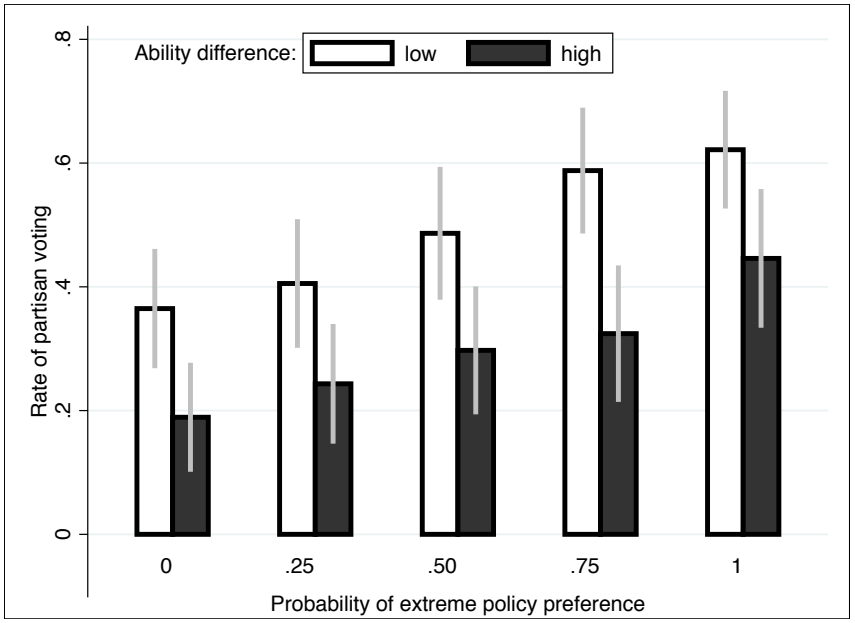
[15]Estimates of the marginal effects are computed based on the regression in Table B.4 in the SI. The effect shown is the average marginal effect of a change in probability of citizens being positioned on the extreme of .25 when the other variables are hold at their mean.

In the Theory section, we assume that agents perceive their probability of influencing the election outcome as constant. While our experiment consists of a medium-sized election (22-24 voters), it is possible that subjects take into account the strategic response of other subjects when forming their belief about their probability of being pivotal. Accordingly, subjects may anticipate that their probability of being pivotal is a function of the distribution of ideal points (q), and may be more likely to vote expressively when the probability of being pivotal is low. This could affect our identification strategy if the probability of being pivotal is negatively correlated with q. Note, however, that the probability of being pivotal is increasing with the degree of partisan voting, which implies that the probability of being pivotal is positively correlated with q. Therefore, the observed voting behavior is consistent with our interpretation of partisan voting for $q = 0$ as an *upper bound* on expressive voting.

Is there an interaction between expressive and instrumental motivations in driving behavior? We consider the sensitivity of partisan voting to the degree of difference in candidate ability. Figure 6 shows the level of partisan voting when the ability difference between in-group and out-group candidate is "low" or "high". While, as predicted, partisan voting does decrease as the ability difference between the candidates increases, this decrease appears to be solely due to a decrease in expressive partisan voting. The level of partisan voting decreases substantially for $q = 0$ (expressive voting), while the degree to which partisan voting increases with q (instrumental voting) remains unaffected.[16]

[16]This difference in partisan voting also shows in a significant coefficient on a high negative ability difference-dummy in regression model 2 in Tables B.6 and B.7 in the SI.

Figure 6: Partisan voting when the ability difference between candidates is low (difference in candidate ability in-group/out-group: low ability vs medium ability or medium ability vs high ability) or high (difference in candidate ability in-group/out-group: low ability vs high ability)



Finally, we consider whether instrumental partisan voting is rational based on the allocation decisions of the candidates. We see that variation in partisan voting is mirrored in the candidates' average allocation choices. When the probability of citizens being located at the extreme (Left for A-citizens and Right for B-citizens) increases, allocation to the extreme position where the own group is more and more likely to reside increases (See Figure 5). Average allocation of tokens to the extreme position in a decision situation with a probability of 1 that citizens are at the extreme is $6.78\,(5.99, 7.58)$ while it is only $1.81\,(1.27, 2.35)$ with a probability of 0. Average allocation to the Center is $1.20\,(.64, 1.77)$ and $7.23\,(6.52, 8.00)$, respectively. The marginal effect of a change in the probability that citizens are located at the extreme of .25 leads to rise of allocation to the extreme of $1.31\,(1.09, 1.53)$ tokens but to a decline in allocation to the center of $1.61\,(1.85, 1.37)$.[17]

On average, when compared to the voting behavior that would maximize individual payoffs, partisan voting is too low for high degrees of polarization in policy preferences, and too high for low degrees of polarization in policy preferences – i.e. subjects' behavior is consistent with the model's predictions regarding the comparative statics, but are off on the levels. Partisan voting is not purely driven by a subset of citizens who always vote along partisan lines: only

[17]Marginal effects are computed based on the regression shown in Table B.5 in the SI.

14 percent of citizens vote for their co-partisan candidate when the cost (in ability difference) is high and polarization in policy preferences is low, while 61 percent vote for their co-partisan candidate when the cost is low and polarization in policy preferences is high.

4.3 Evaluating the effect of increasing affect

The results of the baseline treatment confirm the predictions of the Identity model with respect to partisan voting and the polarization of policy preferences, and identifies both expressive and instrumental partisan voting. In this subsection, we report the results of two treatments designed to vary the *intensity* of partisan affect (λ).

To vary the level of partisan affect, we modify our baseline design to divide subjects into groups based on their reply to a question designed to prime a natural identity. For the FSU sample, subjects were allocated to groups based on whether they reported to feel closer to Democrats or Republicans.[18] For the Berlin sample, subjects were allocated to groups based on whether they reported that they are more likely to use their bike than car[19] While this may seem a strange choice of an identity-group, a pre-experiment survey of the experimental pool in Berlin showed that students rank the car/bike-divide as being more important then religious or political affiliations and that subjects are evenly split between car and bike.

To place the results from FSU in context, the sessions were run in June of 2016, shortly after Donald Trump had secured the nomination as the Republican presidential candidate. Given the contentious nature of the 2016 presidential election, we had the ex-ante expectation that the level of partisan affect induced by subjects party identity would be significantly greater than a minimal group intervention.

As shown in Figure 7, however, patterns of partisan voting are nearly identical for party identity and minimal group treatments. Looking at the allocation decisions of candidates, we see that this null finding is due to a treatment failure: as detailed in the experimental design section, subjects' allocation decisions when $q = 1$ gives us a measure of in-group affect, since in this case the candidate allocation decision is equivalent to a zero-sum "divide-the-dollar" game. Subjects' allocation is slightly *less* biased towards the in-group for the party identity treatment on average (this difference, however, is not significant). Therefore, given the non-increase in the

[18] We ran this treatment at FSU since questionnaires showed that their subject pool was roughly evenly divided between Democrats and Republicans – we also inform subjects of this fact before they select a group.

[19] In German: "Sagen Sie uns bitte, ob Sie öfters Ihr Fahrrad oder Auto benutzen?

partisan bias of the candidates' allocations, the non-increase in partisan voting is still perfectly in line with the theoretical predictions.

Figure 7: Rate of partisan voting by policy preference polarization and treatment

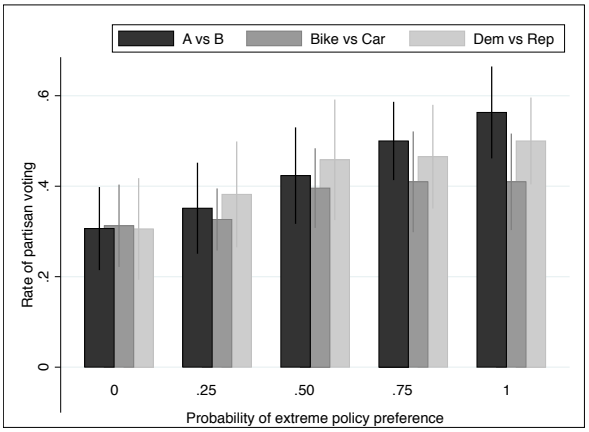
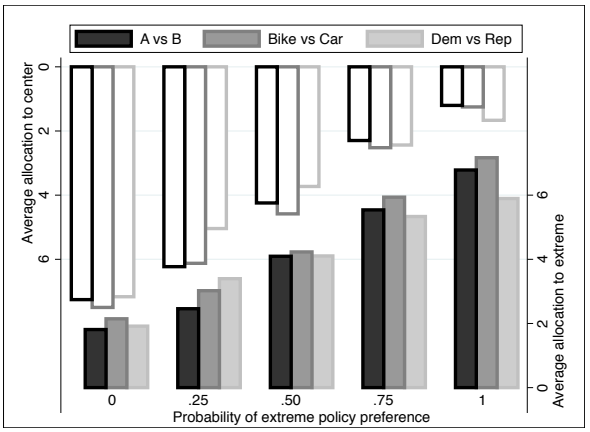


Figure 8: Rate of allocation to extreme and center by policy preference polarization and treatment



The treatment failure is interesting and we offer two potential explanations for the finding. First, the use of a natural identity may trigger a social norm against discrimination that is absent when group membership is randomly assigned. Indeed, the results of the non-political natural identity treatment from Berlin are consistent with this explanation. Figure 7 shows that subjects display a slight decrease in the level of aggregate partisan voting, despite a small increase in average allocations to the in-group.[20].

A second explanation concerns our experimental pool. When making choices over the distribution of payoffs as candidates, the subjects have two pieces of information about the recipients: 1) their party identities, and 2) that they are all students attending the same university. While the subject may have a different partisan identity than the subject in the out-group, given their common status as students, they are ostensibly relatively close to members of the out-group on other social dimensions such as age, socioeconomic characteristics, or which sport team they support. Therefore, controlling for many other dimensions of social identity, the impact of partisan identity is no greater than a minimal group intervention. One caveat on this interpretation is that we chose FSU precisely because it features a student body that is roughly evenly split between Democrats and Republicans – it is possible, either due to selection or socialization, that party identity has a greater impact at universities with a student body that is more homogeneous in its political leanings.

[20]See regression model 3 in Tables B.6 and B.7 in the SI

Lastly, while our party identity treatment fails to implement a higher level of affect than our minimal group treatment, subjects were asked to self-report the strength of their party-identification in an post-experiment questionnaire. We use the variation in the strength of party identity within the subject pool to investigate the impact of higher affect. Our treatments were not explicitly designed to test the impact of higher affect using within-session variation thus, this ex-post analysis should be considered as an exploratory.

Figure 9 shows that our measure of expressive partisan voting (partisan voting at $q = 0$) features no significant difference between subjects who reported a strong or weak party identification, albeit with a small sample size. At larger values of q, however, we see a significant increase in the level of partisan voting for strongly partisan subjects.[21] This suggests an increase in instrumental partisan voting that is driven by higher expectations of partisan bias among strongly partisan subjects. Interestingly, we do not observe an increase in partisan bias in allocation decisions for either subjects with strong or with weak party identification (see Figure 10).

[21] In regression model 4 in Tables B.6 and B.7 in the SI, we see that the interaction of the strong partisan dummy and q is positive and significant. However, as seen in model 5, the interaction is not significant if we include the strong partisan dummy *and* the interaction – this could be due to the small sample of strong partisans, or due to the non-monotonic relationship between partisan voting and q exhibited by strong partisans (see Figure 9).

Figure 9: Rate of partisan voting in the baseline treatment (FSU sample) by policy preference polarization and self-reported strength of party identification

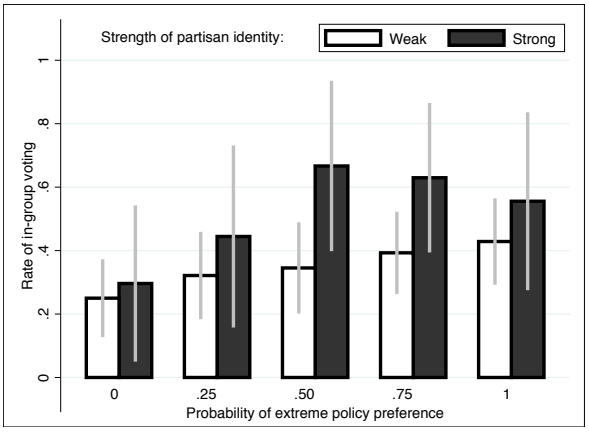
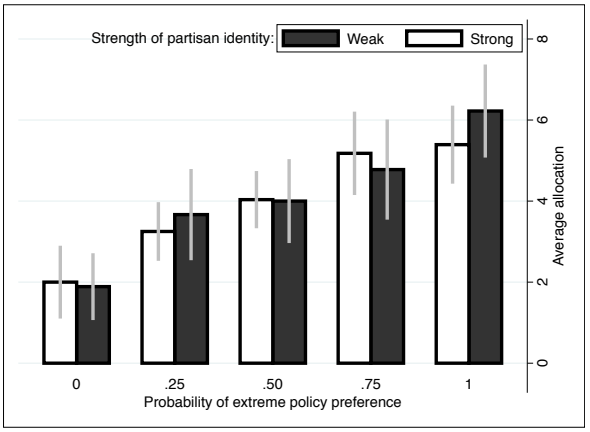


Figure 10: Allocation to partisan extreme (Left for Candidate A and Right for Candidate B) and center in the baseline treatment (FSU sample) by policy preference polarization and self-reported strength of party identification



Summarizing,

Result 3

Our experiment gives weak evidence for an increase in partisan voting with stronger affect.

This result, however, comes with the caveat that our experiment failed to induce stronger partisan affect *between* treatments.[22]

5 Conclusion

In this paper we provided evidence for how instrumental motivations drive partisan voting. We show that this relationship is strongest when there is large underlying polarization in policy preferences. We do not deny that expressive concerns are a driver of partisan voting. With stronger group identities than the one we induce or prime in the laboratory, expressive motivations will be an important factor in voters decision-making. We do claim that some of voters' decisions that seems to be expressive voting are actually driven by instrumental motivations. The fact that expressive and instrumental concerns interact in determining political behavior is not new. In the context of political polarization, however, our theoretical and empirical study is the first to separate expressive and instrumental motivations for the behaviors and attitudes

[22]The SI holds results from yet another treatment we implemented where subjects were induced with multiple-identities to gauge the effect of potentially different intensity in social identity on behavior. We also find weak evidence for an increase in partisan voting with stronger affect in this treatment

so prevalent in the world right now.

In addition to confirming an instrumental channel between affective polarization and partisan voting, our research provides suggestive evidence for how identity may magnify the effect of policy polarization. While policy polarization is not sufficient to cause partisan behavior alone, that is, a society divided into two groups with starkly divergent policy preferences but with low levels of affective polarization may still support a relatively consensual, non-partisan and efficient political system. Our findings suggest that socially-costly partisan behavior will occur when both policy and affective polarization are high. In this case, as a society becomes polarized on a social dimension, voters come to expect a higher degree of partisanship from elected officials, which causes them to rationally respond by voting along partisan lines, leading to the selection of candidates with lower average levels of valence.

This narrative is particularly problematic when applied to the US context, where evidence suggests that social polarization occurs along an *explicitly political* dimension (Republican/Democrat). In this case, a self-reinforcing cycle may arise: Affective polarization leads to the perception of increasing divergence in the policy platforms of the two parties – in turn, this may cause partisan identities to strengthen, leading to an even greater degree of affective polarization and a further increase in partisan behavior.

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Supporting Information

A Proofs for Section 2

Proof of Lemma 1:
First, note that the candidates' aggregate payoffs are constant and equal to $x^l + x^w$. Next, note that $\max_{\mathbf{p}} \sum^N v(\mathbf{p}, p_i) = \{0, 1, 0\}$ since a "policy unit" placed at p^m generates aggregate payoffs of $n(1-q) + nq$, while a policy unit placed at p^l or p^r generates aggregate payoffs of $1/2n(1-q) + nq \leq n(1-q) + nq$. Lastly, given that valence is a public good, aggregate payoffs are higher when the candidate with $\alpha_k \geq \alpha_{k'}$ wins the election. Together, this implies that maximal aggregate payoffs are achieved when both candidates choose centrist policies, and all citizens vote for the highest-valence candidate. ■

Proof of Lemma 2:
Since the equilibrium concept is SPNE, by backward induction, the winning candidate will choose the policy that maximizes their social preferences, $g(\mathbf{x}^I, \mathbf{x}^{I^-}) = \sum_{j \neq i} \sqrt{x_j}$. And since payoffs are separable, this is equivalent to the following maximization problem, $\max_{\mathbf{p}} \sum^N \sqrt{E[v(\mathbf{p}, p_i)]}$, which is equal to $\{0, 1, 0\}$ by the proof of Lemma 1. ■

Proof of Lemma 3:
As in the above proof, the winning candidate will choose the policy that maximizes their social preferences, $g(\mathbf{x}^I, \mathbf{x}^{I^-})$, which results in the following maximization problem:

$$\max_{\mathbf{p}} \left(\lambda \sum^{I} E[v(\mathbf{p}^w, p_i)]^{\frac{1}{2}} + (1-\lambda) \sum^{I^-} E[v(\mathbf{p}^w, p_i)]^{\frac{1}{2}} \right).$$

For simplicity, we assume c^A wins the election and sets $\mathbf{p}^w = \mathbf{p}^A$ ($\mathbf{p}^B$ is symmetric).
To prove the result, we focus on the marginal utility that c^A receives from shifting a unit of policy to p^l, *given* $\mathbf{p}^A = \{0, 1, 0\}$. Note that:

$$E[v(\mathbf{p}^w, p_i)] = q(p^l + 0.5p^m) + (1-q)(0.5p^l + p^m + 0.5p^r),$$

for $i \in A$, and

$$E[v(\mathbf{p}^w, p_i)] = (1-q)(0.5p^l + p^m + 0.5p^r) + q(0.5p^m + p^r),$$

for $i \in B$. Therefore, the relative marginal utility of partisan policy at $\mathbf{p}^A = \{0, 1, 0\}$ is equal to:

$$\begin{aligned} &\lambda(n/2-1)\frac{1}{2}E[v(\{0,1,0\}, p_i)|i \in A]^{-\frac{1}{2}}[\frac{1}{2}q - \frac{1}{2}(1-q)] \\ &+(1-\lambda)(n/2-1)\frac{1}{2}E[v(\{0,1,0\}, p_i)|i \in B]^{-\frac{1}{2}}[-\frac{1}{2}(1-q) + -\frac{1}{2}q], \end{aligned} \tag{10}$$

which is positive iff:

$$\lambda[\frac{1}{2}q - \frac{1}{2}(1-q)] > (1-\lambda)[\frac{1}{2}(1-q) + \frac{1}{2}q] \Rightarrow \lambda(2q-1) > 1-\lambda. \tag{11}$$

(Note that the same calculation for p^r yields the equation $(1-\lambda)(2q-1) > \lambda$, which implies that $p^r = 0$, since the marginal relative utility of placing a unit of policy at the outgroup extreme is always negative.) Therefore, $\mathbf{p}^A = \{0, 1, 0\}$ if Equation 11 does not hold, and $\mathbf{p}^A = \{p^l, p^m, 0\}$ with $p^l > 0$ if Equation 11 holds. ■

Proof of Proposition 1:

The proof follows from Expression 10 and Equation 11 in the proof of Lemma 3 above. First, fixing λ, there exists q^* such that $\lambda(2q-1) = 1-\lambda$, since $\lambda > 0.5$. Specifically:

$$q^* = \frac{1-\lambda}{2\lambda} + \frac{1}{2}.$$

For, $q < q^*$, Equation 11 does not hold, and as shown in the proof of Lemma 3, the unique equilibrium policies for both candidates set $\mathbf{p}^I = \{0, 1, 0\}$; for $q > q^*$, however, both candidates will allocate a strictly positive amount to ingroup extreme. For convenience, assume c^A wins the election. In this case, c^A will set p^l, p^m such that the relative marginal utility of partisan policy (Expression 10) is equal to zero. That is:

$$\frac{E[v(\{p^l, p^m, 0\}, p_i)|i \in A]}{E[v(\{p^l, p^m, 0\}, p_i)|i \in B]} = \left(\frac{\lambda(2q-1)}{(1-\lambda)}\right)^2 \tag{12}$$

Both the RHS and LHS of Equation 12 are continuous in q, λ and p^l. Moreover, for $q > q^*$, the LHS is increasing in p^l since $E[v(\{p^l, p^m, 0\}, p_i)|i \in A]$ is increasing in p^l and $E[v(\{p^l, p^m, 0\}, p_i)|i \in B]$ is decreasing in p^l, which implies a unique crossing.
For $\partial\Delta^x/\partial\lambda$, note that the RHS of Equation 12 is increasing in λ while the LHS is constant. Therefore, the equilibrium value of p^l is increasing in λ, which implies that $E[v(\{p^l, p^m, 0\}, p_i)|i \in A] - E[v(\{p^l, p^m, 0\}, p_i)|i \in B]$ is increasing in λ as well.
Second, the case of $\partial\Delta^x/\partial q$ is a bit more complex since both the RHS and LHS of Equation 12 are functions of q. However, the result can be proved directly. First, we introduce the following simplified notation: $E[v^I] = E[v(\{p^l, p^m, 0\}, p_i)|i \in I]$ and $X = (\lambda(2q-1)/(1-\lambda))^2$.
Consider a discrete increase in q to $q' = q + \Delta q$. We wish to show that $E[v^A]' - E[v^B]' > E[v^A] - E[v^B]$ or, equivalently, that $\Delta E[v^A] > \Delta E[v^B]$. Using this notation and rearranging Equation 12, we get:

$$E[v^A]' + (X + \Delta X)E[v^B]' = 0 = E[v^A] + XE[v^B].$$

And since X is increasing in q, which implies that $\Delta X > 0$, we get:

$$E[v^A]' + XE[v^B]' > E[v^A] + XE[v^B].$$

Rearranging this equation gives:

$$\Delta E[v^A] + X\Delta E[v^B] > 0 \Rightarrow \Delta E[v^A] > X\Delta E[v^B].$$

Note that since $X > 1$ this expression implies that $\Delta E[v^A] > \Delta E[v^B]$, which proves the result for a discrete change. Lastly, since all expressions are continuous in q, this result holds as $\Delta q \to 0$. ■

Proof of Proposition 2:
Lemma 2 shows that under the Benchmark model, both candidates will select $\mathbf{p}^w = \{0, 1, 0\}$. Since both candidates select the same policy, citizen i receives the following relative expected utility for voting for the ingroup candidate:

$$e_i + \bar{p}(\alpha^I - \alpha^{i^-}),$$

which is positive iff $e_i \geq \bar{p}\Delta^\alpha$. ■

Proof of Proposition 3:
Lemma 3 shows that under the Identity model, both candidates may select policies that favor their partisan ingroup. Therefore, citizen i receives the following relative expected utility for

voting for the ingroup candidate:

$$e_i + \bar{p}\big(E[x_i|\mathbf{p}^I] - E[x_i|\mathbf{p}^{I^-}] + \alpha^I - \alpha^{i^-}\big),$$

which is positive iff $e_i + \bar{p}\Delta^x \geq \bar{p}\Delta^\alpha$. ■

Proof of Corollary 1:
(i) Follows directly from Proposition 2: Under the Benchmark model the candidates choose the same policy for all q, which implies that citizens have a constant incentive to vote for the ingroup candidate.
(ii) In contrast to (i), Proposition 1 shows that the incentive to vote for the ingroup candidate is increasing in q, since candidates choose more partisan policy for higher q.
(iii) Proposition 1 shows that when $q = 0$, there is no instrumental incentive to vote for the ingroup candidate under the Identity model since $\Delta^x = 0$. ■

B Statistical appendix

B.1 Session statistics

Table B.1: Session statistics

	Treatment								
	Single ID								
	A vs B			Bike vs Car		Dem vs Rep		Multi ID	
Session	1	2	3	1	2	1	2	1	2
Number of subjects	24	24	26	24	24	24	24	24	24
Number of observations									
of citizens	1080	1080	1170	1080	1080	1080	1080	864	864
of candidates	120	120	130	120	120	120	120	96	96
Average earnings (in Euro)	13.9	12.9	13.4	14.5	12.9	13.3	14.3	18.0	16.6

B.2 Summary statistics

Table B.2: Summary statistics

	Single ID			
Variable	**A vs B**	**Bike vs Car**	**Dem vs Rep**	**Multi-ID**
Share of subjects in A	.50 (.50)			.50 (.50)
Share of subjects in Bike		.52 (.50)		.65 (.48)
Share of subjects in Dem			.69 (.46)	
voting decision				
vote for A over B	.52 (.50)			
vote for Bike over Car		.55 (.50)		
vote for Dem vs Rep			.61 (.49)	
vote for A-Bike over B-Car				.55 (.50)
vote for A-Car over B-Bike				.41 (.49)
allocation decision				
Left	2.84 (2.87)	2.89 (2.91)	3.65 (2.87)	
Center	4.33 (3.24)	4.40 (3.25)	4.01 (2.92)	
Right	2.68 (2.67)	2.67 (3.10)	2.05 (2.02)	
Left-Up				2.76 (2.87)
Right-Up				2.21 (2.49)
Center				5.31 (4.35)
Right-Down				2.26 (2.42)
Left-Down				2.51 (2.71)

Table B.3: Difference in rate of in-group voting (=partisan voting) and in average in-group allocations (=partisan allocation) between A vs B-treatment and Bike vs Car- as well as Dem vs Rep-treatment.

A vs B vs		**Partisan voting**	**Partisan allocation** to extreme	to center
Bike vs Car	0	-.01 (-.13,.12)	-.34 (-1.35,.68)	-.24 (-1.41,.93)
	.25	.02 (-.09,.14)	-.56 (-1.31,.18)	.10 (-.85,1.06)
	.5	.03 (-.13,.19)	-.13 (-1.10,.83)	-.34 (-1.12,.44)
	.75	.09 (-.07,.25)	-.40 (-1.29,.50)	-.22 (-.80,.35)
	1	.15 (-.00,.31)	-.38 (-1.52,.76)	-.05 (-.85,.75)
	Overall	.06 (-.06,.18)	-.36 (-.95,.23)	-.15 (-.58,.28)
Dem vs Rep	0	.00 (-.13,.14)	-.11 (-.98,.77)	.09 (-1.11,1.29)
	.25	-.03 (-.16,.10)	-.94 (-1.68,-.20)	1.19 (.41,1.97)
	.5	-.03 (-.18,.11)	-.01 (-.86,.84)	.51 (-.23,1.26)
	.75	.03 (-.10,.17)	.21 (-.75,1.16)	-.14 (-.83,.55)
	1	.06 (-.07,.20)	.89 (-.36,2.14)	-.46 (-1.44,.52)
	Overall	.00 (-.11,.13)	.01 (-.58,.59)	.24 (-.16,.63)

B.3 In-group voting, partisan voting, allocation decision regressions

Table B.4: Logistical regression of in-group voting and partisan voting on probability of extreme policy preferences (q), order in which q is shown to subjects, and round of play in the baseline treatment; errors are clustered on the subject-level

VARIABLES	In-group voting	Partisan voting
q	0.68***	1.10***
	(0.140)	(0.208)
Order of q	-0.08	-0.25
	(0.135)	(0.199)
Round	0.01	0.03
	(0.015)	(0.022)
Constant	0.85***	-0.74***
	(0.138)	(0.246)
Observations	3,330	1,110

Subject-level clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

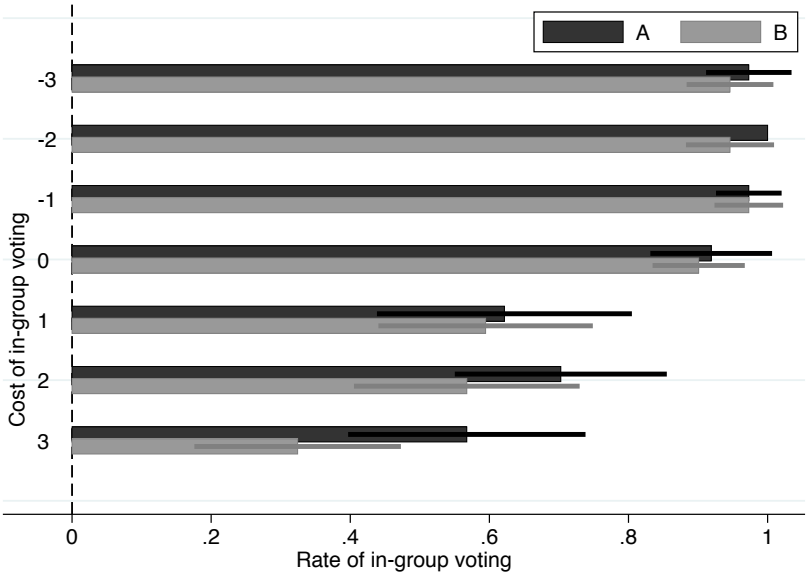
Table B.5: Linear least squares regression of allocation to in-group extreme and allocation to center on the probability of the extreme policy preferences (q) and round of play in the baseline treatment. Note, the round of play variable already captures variation in the order of probabilities; errors are clustered on the subject-level

VARIABLES	Allocation to in-group extreme	Allocation to center
q	5.23***	-6.44***
	(0.419)	(0.465)
Round	-0.01	0.01
	(0.008)	(0.009)
Constant	1.70***	7.25***
	(0.258)	(0.321)
Observations	370	370
R-squared	0.395	0.489

Subject-level clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

B.4 Robustness of findings to difference in groups A vs B

Figure B.1: Rate of in-group voting in the A vs B-treatment with polarization in policy preferences of 1 (full polarization) by in-group ability difference separated by group membership in A vs B



B.5 Robustness of findings in multi-identity treatment

Our finding of instrumental motivations for group identity-driven behavior may be undermined by the weakness of identities induced in the laboratory: for any expressive motivation to surface, a stronger, more contextualized identity may be needed. We implement the Bike vs Car-, Dem vs Rep-, and multi-identity-treatments exactly for the purpose of inducing, even if only marginally, stronger identities. Partisan voting and partisan allocation emerges as well, as expected, when

Table B.6: Linear least squares regression of partisan voting on the probability of extreme policy preferences (q), the order in which q is shown to subjects, round of play, and other relevant variables: treatment, FSU vs Berlin sample, high negative ability difference, strong partisan identity (recovered in the exit survey from the FSU sample) on selected samples.

	(1)	(2)	(3)	(4)	(5)
			All	Dem vs Rep	Dem vs Rep
VARIABLES	Baseline	Baseline	treatments	treatment	treatment
q	0.2570***	0.2783***	0.2647***		0.1669**
	(0.057)	(0.055)	(0.048)		(0.064)
Bike vs Car			0.0187		
			(0.065)		
Dem vs Rep			0.0311		
			(0.071)		
Bike vs Car × q			-0.1538**		
			(0.073)		
Dem vs Rep × q			-0.0745		
			(0.068)		
FSU sample	-0.0027				
	(0.092)				
FSU sample × q	0.0196				
	(0.103)				
High negative ability difference		-0.1706***			
		(0.042)			
High negative ability difference × q		-0.0419			
		(0.055)			
Strong partisan identity					0.1256
					(0.140)
Strong partisan identity × q				0.3058*	0.0886
				(0.156)	(0.089)
Order of q	-0.0597	-0.0370	-0.0279	0.0494	0.0404
	(0.047)	(0.045)	(0.030)	(0.057)	(0.056)
Round	0.0067	0.0041	0.0030	-0.0065	-0.0055
	(0.005)	(0.005)	(0.003)	(0.007)	(0.006)
Constant	0.3233***	0.3700***	0.3108***	0.3526***	0.2698***
	(0.063)	(0.061)	(0.049)	(0.075)	(0.085)
Observations	1,110	1,110	2,550	555	555
R-squared	0.037	0.070	0.026	0.035	0.046

Subject-level clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.7: Logistic regression of partisan voting on the probability of extreme policy preferences (q), the order in which q is shown to subjects, round of play, and other relevant variables: treatment, FSU vs Berlin sample, high negative ability difference, strong partisan identity (recovered in the exit survey from the FSU sample) on selected samples.

	(1)	(2)	(3)	(4)	(5)
			All	Dem vs Rep	Dem vs Rep
VARIABLES	Baseline	Baseline	treatments	treatment	treatment
q	1.0728***	1.1391***	1.1040***		0.7449**
	(0.248)	(0.236)	(0.207)		(0.295)
Bike vs Car			0.0778		
			(0.295)		
Dem vs Rep			0.1376		
			(0.318)		
Bike vs Car × q			-0.6268**		
			(0.316)		
Dem vs Rep × q			-0.3156		
			(0.295)		
FSU sample	-0.0125				
	(0.420)				
FSU sample × q	0.0818				
	(0.451)				
High negative ability difference		-0.8530***			
		(0.215)			
High negative ability difference × q		0.0149			
		(0.259)			
Strong partisan identity					0.5665
					(0.598)
Strong partisan identity × q				1.2630*	0.2967
				(0.673)	(0.393)
Order of q	-0.2517	-0.1589	-0.1175	0.2158	0.1804
	(0.200)	(0.197)	(0.125)	(0.249)	(0.244)
Round	0.0282	0.0177	0.0127	-0.0284	-0.0246
	(0.022)	(0.022)	(0.014)	(0.028)	(0.027)
Constant	-0.7372***	-0.5304**	-0.7892***	-0.9918**	-0.6097*
	(0.281)	(0.261)	(0.220)	(0.404)	(0.326)
Observations	1,110	1,110	2,550	555	555

Subject-level clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

inducing stronger identities but we do not see a large increase in the strength of these in-group biases in vote choices and allocation decisions.

A more valid test of whether subjects attach higher salience to a stronger identity may be to put two dimensions of group identities that supposedly differ in their strength side-by-side and let subjects choose which one they emphasis in their decision-making. We do so by letting subjects decide whether they want to put more emphasis on the distinction A vs B or Bike vs Car, as we chose to implement in our multi-identity treatment. In this treatment, subjects are characterized by a compound identity: A-Bike, B-Bike, A-Car, or B-Car. We find, first, while partisan voting for candidates who share the exact identity with the citizen is larger than the one for those who share the A/B- or Bike/Car-identity, in-group allocations are smallest for this candidate. Second, and more importantly, there is, again, a (weak) increase in partisan voting and in partisan allocations with increasing policy preference polarization.

In this multi-identity treatment, citizens are labelled A-Bike-, B-Bike-, A-Car-, or B-Car-citizens according to their group assignment. Assignment to *Bike* or *Car* takes place before subjects learn the content of the voting game and assignment to A or B occurs after subjects received instructions for the voting game but before the voting game commences. Candidates are asked to allocate up to 16 tokens to the five positions of a preference space: four positions in the extreme corners, *Left-Up*, *Right-Up*, *Right-Down*, or *Left-Down*, and one position at the *Center*. Voters decide whether to vote for one of two candidates in two possible pairings of candidates: *A-Bike* vs *B-Car* or *A-Car* vs *B-Bike*. The probability with which citizens are at the extreme of the preference space is either .25 or .75. Voters are, again, also told the ability and group membership of both of the candidates. The decision environment is described not only by the probability with which citizens are at the extreme (.25 or .75) but also by which pairing of candidates they can choose from: A-Bike vs B-Car or A-Car vs B-Bike. Here, the probability level is fixed for 18 rounds while the pairing of candidate is the same for 9 rounds (while the level of ability varies of those 9 rounds). For payoffs, a decision situation is picked at random: it is represented by a probability, candidate abilities, and a candidate pairing. In this treatment, voters will receive one token for each token that was allocated to the extreme of the preference space associated with their group and half a token for each token that was allocated to a position in the preference space contiguous to the extreme. That is, e.g., a A-Bike-citizen receives 1 token from each 1 token allocated to Left-Up and .5 token from each 1 token allocated to Left-Down, Right-Up, and Center. Similarly, A-Car-, B-Bike-, and B-Car-citizens receive a full 1 token from each 1 token allocated to their extreme corner but only .5 token from each 1 token allocated to the corners contiguous to theirs and to the Center.

In 2 sessions with 24 subjects each, we collect, for each subject, 36 observations as citizen and 4 observations as candidate. In total, we collect 1728 citizen-round observations in the multi-identity treatment. The total number of candidate-round observations is 192.[23]

Figure B.2 and B.3 compare in-group voting for and in-group allocations of candidates who share the exact identity of the citizen, those who share their A/B-identity, and those who share their Bike/Car-identity. First, while partisan voting for candidates who share the exact identity with the citizen is larger than the one for those who share the A/B- or Bike/Car-identity, in-group allocations are smallest for this candidate.

[23]In session 1 of this treatment, citizens choices were not recorded correctly in the payment file. We therefore paid the for subjects in the role of citizens maximum possible earning of 16 tokens slightly increasing the average payoff of that session relative to the other session of that treatment. Subjects only learned at the moment of payout that this error occurred, in this way, their choices throughout the experiments could not have been affected.

Figure B.2: Rate of partisan voting by policy preference polarization and type of shared identity – exact, A/B, or Bike/Car-identity – for negative ability difference between in- and out-group candidate

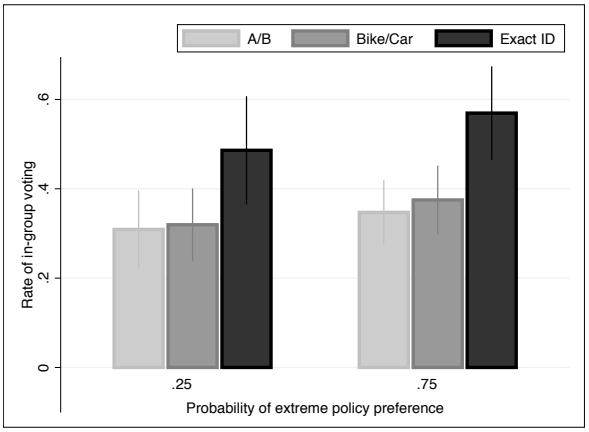
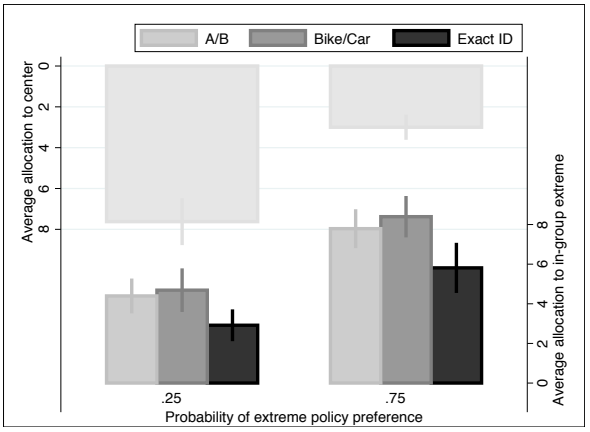


Figure B.3: Rate of allocation to extreme and center by policy preference polarization and type of shared identity – exact, A/B, or Bike/Car-identity



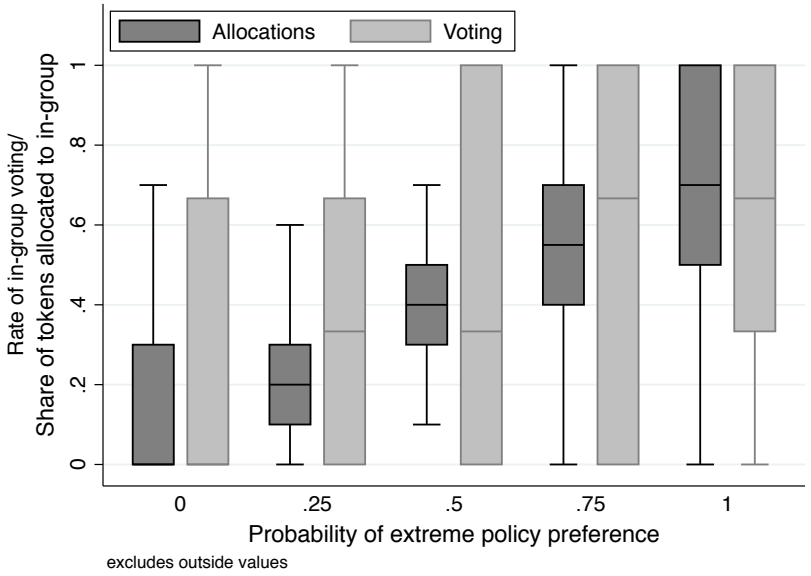
Second, and more importantly, there is, again, a (weak) increase in partisan voting and in partisan allocations with increasing policy preference polarization. The change in partisan voting, however, is not significantly different from zero, i.e., the marginal effect of raising the level of policy preference polarization from .25 to .75 heightens the rate of voting for the in-group candidate who exactly matches the citizens identity by .03 % (-.03,.08). In contrast, more polarization in policy preferences systematically increase allocations to all types of in-group citizens, i.e., those who share an exact, A/B, or Bike/Car-identity with the candidate. A change in polarization from .25 to .75 raises in-group allocations by 2.53 (1.66,3.41) of the candidates who share the exact identity, 3.11 (2.21,4.00) of those who share the A/B-identity, and by 3.33 (2.38,4.28) tokens of those who share the Bike/Car-identity. More polarization also decreases allocation to the center by 4.43 (3.29,5.57) tokens.

B.6 Robustness of findings to subject-level idiosyncrasies

We now turn to the question whether the observed patterns are robust to subject-level effects. In other words, are results driven by a small subset of subjects or do we observe a general tendency in behavior. We find, in the aggregate, that partisan voting is driven by instrumental motivations rooted in group identities; in-group voting varies with the level of polarization in policy preferences and is, in this pattern, consistent with candidates' in-group favoritism when making allocation decision To characterize subjects individual-level behavior, we investigate whether (1) the distribution of individual-level choices is rather narrow around the overall treatment mean, (2) they condition their choices as citizens on their behavior as candidates and whether, and (3) the prevalent behavioral type is one whose choices are driven by instrumental motivations.

Figure B.4 shows the distribution of subject-level rates of partisan voting and subject-level average allocations to the in-group extreme (Left for candidates in Group A/Bike/Dem and Right for candidates in group B/Car/Rep). The spread of subjects' behavior is quite narrow for allocations and follows the aggregate pattern of increasing allocation to the extreme with increasing polarization. The overall average allocation as well as most of the weight in the distribution of subject's average allocation are moving upwards with increasing probability of the extreme policy preference.

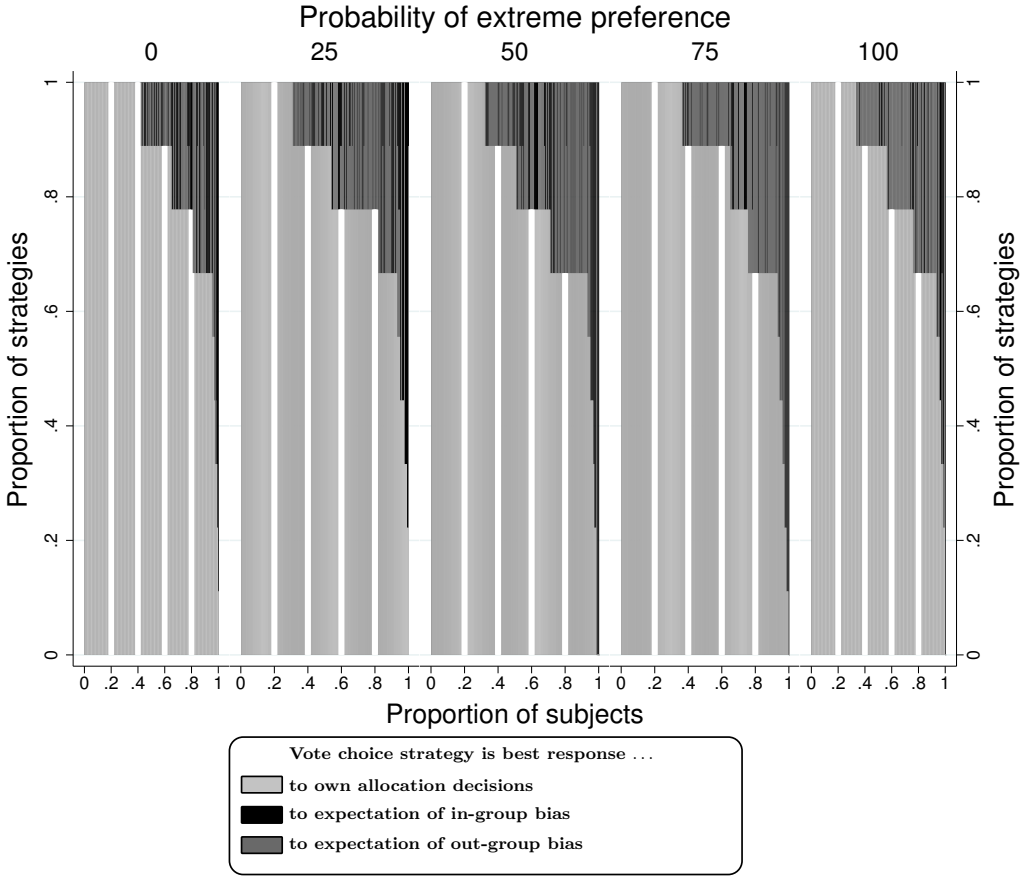
Figure B.4: Subject-level: partisan voting and average allocation of tokens to in-group extreme over the probability of extreme policy preference



The subject-level pattern for in-group voting is less clear. While the average over subject-level rates of in-group voting are clearly increasing with rising polarization, the spread of this subject-level quantity is certainly wider than what we observe for allocations.

Why is that and is there widespread misfit within subject between allocations and voting behavior? The answer is no. A good approximation of what citizens believe about candidates' behavior is how they themselves chose to allocate. How do citizens vote when we fill in their own allocation choices in each decision situation (characterized by a probability of extreme preferences and abilities assigned to each candidate)? Is their vote choice strategy a best response to their own allocation decisions paired with the ability difference between candidates? Figure B.5 shows that for most subjects it is. 30-40% of subjects always vote for an in-group (out-group) candidate whenever ability difference and their own allocations would give them higher utility than voting for the out-group (in-group) candidate. About 90% of subjects best respond in at least 2/3 of their choices. This is indicated by the dominance of the light gray area in Figure B.5.

Figure B.5: Subject-level: proportion of a vote choices strategy which is a best response to the subjects' own allocation decisions, proportion of in-group votes where expected utility from out-group vote was higher, and proportion of out-group votes where expected utility from in-group vote was higher. Each spike represents behavior of one subject.

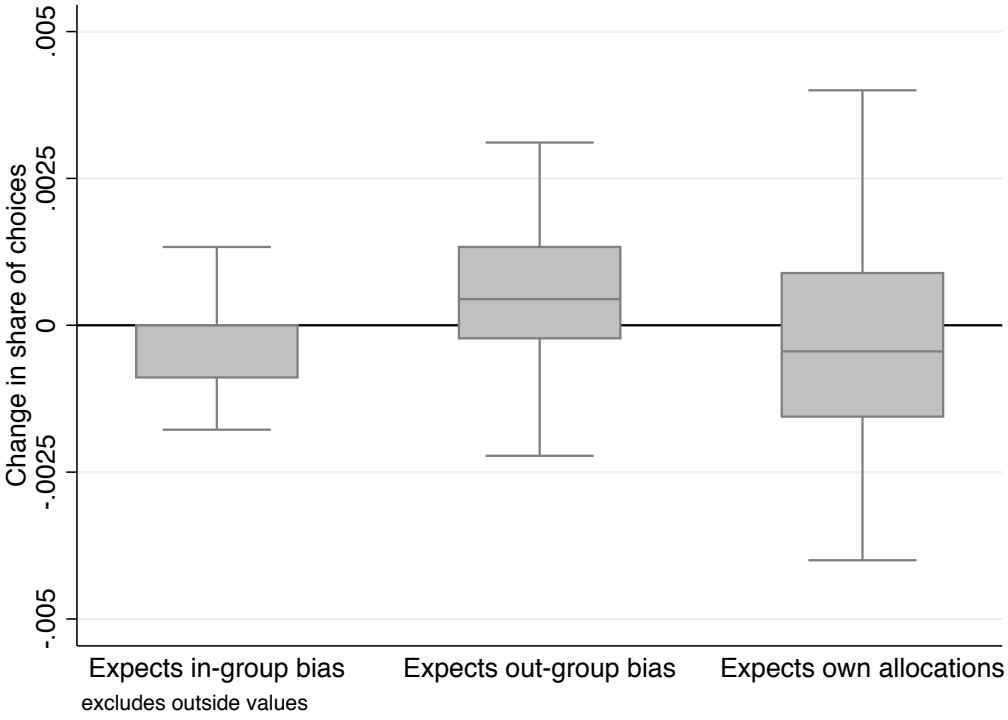


Between 60-70% of subjects sometimes vote for the in-group candidate even though they would obtain a lower payoff than voting for the out-group candidate substituting candidates' allocation decisions with their own allocations. Only a handful of subjects, though, does so in more than 1/3 of their choices. Such behavior describes a strategy that is best responding to the expectation that other subjects, in the role of a candidate, allocate more favorable to the in-group than oneself did. Similar numbers and interpretations are obtained for subjects who sometimes vote for the out-group candidate even though they would obtain a lower payoff than voting for the in-group candidate. Such strategy is optimal if the expectation is that other subjects are allocating less favorable to the in-group than oneself did.

Also, with increasing polarization, those subjects who do not best respond to their own allocations all the time, tend to vote for the out-group too often while for low probability of citizens' preference being extreme. We see a mix of citizens voting for the in-group too often and citizens voting for the in-group not often enough, given their own allocation decisions accounting for ability differences.

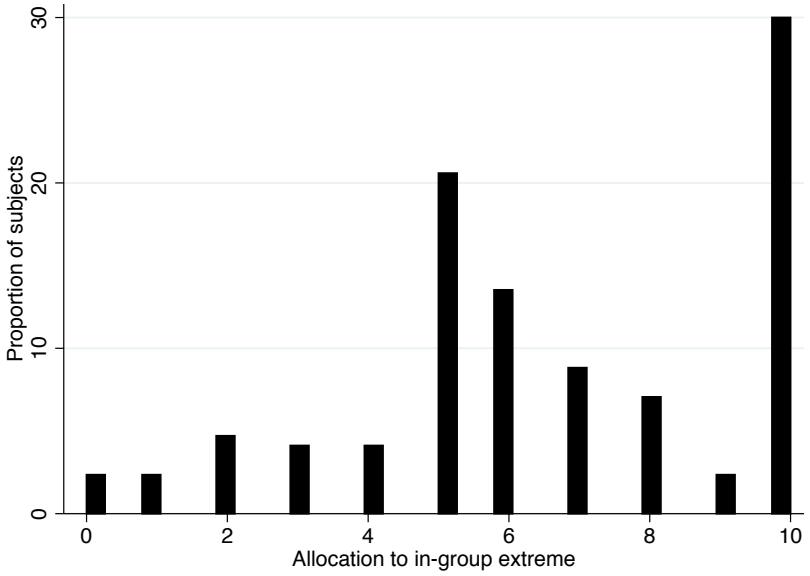
Figure B.6 shows that the profile of strategies within subject does not change with increasing polarization. For the bulk of subjects, increasing polarization by 25% increases the share of any of the strategies by less than 1%.

Figure B.6: Subject-level: distribution of estimated change in share of subject choice type (best responding to own allocations, should vote for in-group but votes for out-group, should vote for out-group but votes for in-group) when polarization increases. Estimate is coefficient on polarization (probability of extreme preference) of regression of share of subject choice type on polarization..



Further, a measure of subjects' underlying in-group bias is also their allocation decision when the probability that citizens have extreme preferences is 1. In this case, distributing tokens between left, right, and center is a divide-the-dollar-game. Whatever a candidate places in tokens on that extreme associated with his or her group assignment, solely benefits his or her fellow group members in the role of citizens. Figure B.7 gives the distribution of subjects' in-group bias score determined as their allocation to the extreme in-group position at full polarization.

Figure B.7: Distribution of subjects by in-group bias in allocations. In-group bias is measured as the allocation to the extreme in-group position when the probability of an extreme ideal point for citizens is 1



In fact, that ability to express in-group favoritism in allocations, which increases with the level of polarization in citizens' preferences, also has the effect that subjects, when making voting decisions, are more likely to best respond to their own allocations in the role of candidates. Each subject-level increase by one token in allocations to the in-group when citizens' preferences are extreme with a probability of 1 leads to a increase in the rate at which that subject best response in voting to the own allocation choices by 1% (0.4%,1.7%). Partisan allocations, in other words, are most crystalized at full polarization.

C Experimental design

C.1 Decision environment by round

The placeholder in the table, e.g. the probabilities "1" to "5" in column 4 were filled with either 0, .25, .5, .75, or 1 for different subjects in random order.

Table C.1: Choices of subjects in the role of citizens and candidates in the voting game by round. Probability of the extreme preference (0, .25, .5, .75, .1) are randomly assigned to each subject by block of 9 rounds each

Round	Citizens	Candidates	Probability Block
1	Vote 1	Allocation 1	1
2	Vote 2	–	
⋮	⋮	–	
9	Vote 9	–	
10	Vote 10	Allocation 2	2
11	Vote 11	–	
⋮	⋮	–	
18	Vote 18	–	
19	Vote 19	Allocation 3	3
20	Vote 20	–	
⋮	⋮	–	
27	Vote 27	–	
28	Vote 28	Allocation 4	4
29	Vote 29	–	
⋮	⋮	–	
36	Vote 36	–	
37	Vote 37	Allocation 5	5
38	Vote 36	–	
⋮	⋮	–	
45	Vote 45	–	

C.2 Instructions: baseline treatment

Introduction
In this experiment you will make a series of choices. At the end of the experiment, you will be paid according to your choices and the choices of other participants. Pay close attention to the instructions because each of your decisions potentially affects your payoff from this experiment. This experiment has two parts. Your total earnings will consist of a show-up fee of 7 Dollars and your earnings from each of the two parts of the experiment. During the course of the experiment you will earn tokens, which will be exchanged into Dollars at the end of the experiment at a rate of

1 Token = 60 Cent.

We will start with a brief instruction period and Part 1 of the experiment. You will then receive instructions for Part 2 of the experiment and finish that part accordingly. Should you have questions while I read out these instructions, please raise your hand and after I have finished reading the instructions, I will come and assist you. Should you have questions during the

experiment, please raise your hand at any time.

Part 1
In part 1 of the experiment, you will make **50 decisions**: 45 in the role of a **Voter** and 5 in the role of a **Candidate**.

Assignment to Group A and Group B
At the beginning of the experiment you will be randomly assigned to either **Group A** or **Group B**. You will remain a member of this group until the end of the experiment; that is, until you have made all 50 decisions.

Decisions as Voter
As a voter you will make 45 decisions. In each decision, you will be asked whether you prefer **Candidate A, who is a member of Group A, or Candidate B, who is a member of Group B**.

While you are making your decisions, you will see the following information on the screen:

1. The level of **Ability** of Candidate A and Candidate B;
2. The probability with which your **Position** is either **Left**, **Center**, or **Right**.

The level of ability of Candidate A and Candidate B is either **Low**, **Average**, or, **High**.

Importantly, if you are assigned to Group A, your position can only be **Left** or **Center** and if you are assigned to Group B, it can only be **Center** or **Right**.

Additionally, when you are assigned to Group A, the probability that your Position is Left, and not Center, in the voter decisions is either 100%, 75%, 50%, 25% or 0%. When you are assigned to Group B, the probability that your Position is Right, and not Center, in the voter decisions is either 100%, 75%, 50%, 25% or 0%.

To assist you, you will see those probabilities on your screen while you make your decision.

Decisions as Candidate
As a Candidate you will make 5 decisions. In each decision, you will be ask how you want **to allocate up to 10 Tokens to the positions Left, Center, or Right**. You may allocate all 10 Tokens to one position, allocate them in any way over two or three positions, allocate less than 10 Tokens, or do not allocate tokens at all.

While you are making your decisions as a Candidate, you will see on the screen **the probabilities with which the Voters are distributed over the three positions Left, Center, and Right**.

That is, for each candidate decision, you will learn whether the Voters in **Group A** are always on Position **Left** (100%) and never on **Center** (0%), mostly Left (75%) and rarely Center (25%), equally likely Left (50%) and Center (50%), rarely Left (25%) and mostly Center (75%), or never Left (0%) and always Center (100%). You will receive similar information about the probability distribution of Voters in **Group B**, differing only in the fact that those Voters are either on Position **Right** or Position **Center**.

To illustrate the distribution of probabilities of Voters in each decision, you will see them on

your screen while making your decisions as a Candidate.

Earnings in part 1 of the experiment
After you have made 45 decisions as a Voter and 5 decisions as a Candidate, your earnings will be calculated as follows:

1. One participant in Group A and one participant in Group B is randomly selected as Candidate A and Candidate B.

2. One of the distribution of probabilities of the Voters Positions is randomly chosen – every distribution is equally likely to be picked.

3. Either a low, average, or high ability is randomly assigned to the two participants who are selected as candidates – each level of ability is equally likely to be picked.

4. The choices of voters in the decision situation that corresponds to the randomly chosen levels of ability of the two candidates, and the randomly picked distribution of probabilities of the Voters Positions, is used to determine whether Candidate A or Candidate B has won the election.

5. The candidate who received a majority of votes of the participants who were not picked to be the candidates is the Winner of the Election; should both candidates receive the same number of votes, a fair coin is tossed to determine the winner.

6. The assigned ability and the allocation of tokens of the **Winner of the Election** now serves as basis for the earnings of the remaining participants. The two participants who were selected to be the candidates are paid according to the outcome of the election.

Should you be picked to be one of the Candidates for the purpose of determining earnings, your earnings will be

15 Tokens

if you are the Winner of the Election, but only

5 Tokens

if you are **not** the Winner of the Election.

If you are picked to be one of the Voters for the purpose of determining earnings, your earnings will be

As a Voter in Position Left:
Income based on the ability of the Winner of the Election + Tokens Left + (Tokens Center)/2

As a Voter in Position Center:
Income based on the ability of the Winner of the Election + Tokens Center + (Tokens Left + Tokens Right)/2

As a Voter in Position Right:
Income based on the ability of the Winner of the Election + Tokens Right + (Tokens Center)/2

The **Income based on the ability of the Winner of the Election** is **5 Tokens** when the assigned ability is **High**, is **3 Tokens** when the ability is **Average**, and is **2 Tokens** when the ability is **Low**.

Here is an example of how your earnings are calculated. After all participants have made all of their decisions, two participants, one from Group A and one from Group B, are randomly chosen to be Candidate A and Candidate B, respectively. Now, suppose Candidate A from Group A is randomly assigned a low ability and Candidate B from Group B is randomly assigned a high ability. Further, suppose the randomly chosen probability distribution specifies that the Position of Voters in Group A is Left with a probability of 75% and Center with a probability of 25%, and that the Position of Voters in Group B is Right with a probability of 75% and Center with a probability of 25%.
Additionally, assume that in the decision situation with this probability distribution, a Candidate A with low ability, and a Candidate B with high ability, a majority of Voters prefer Candidate B. Further suppose that the participant chosen to be Candidate B allocated 7 Tokens to Position Left, 2 to Position Center, and 1 to Position Right. In this way, the participant who was chosen to be Candidate B receives 15 Tokens as Winner of the Election, and the participant who was chosen to be Candidate A receives 5 Tokens for losing the election. Moreover, of the remaining participants, those chosen to be Voters in Position Left receive $5 + 7 + 2/2 = 13$ Tokens, in Position Center receive $5 + 2 + (7 + 1)/2 = 11$ Tokens, and in Position Right receive $5 + 1 + 2/2 = 7$ Tokens.

You will receive instructions for part 2 on your screen at the beginning of that part.

Again, your total earnings in this experiment will consist of a show-up fee of 7 Dollars and your earnings in part 1 and part 2 of the experiment.

C.3 Screenshot

Figure C.1: Citizen decision screen

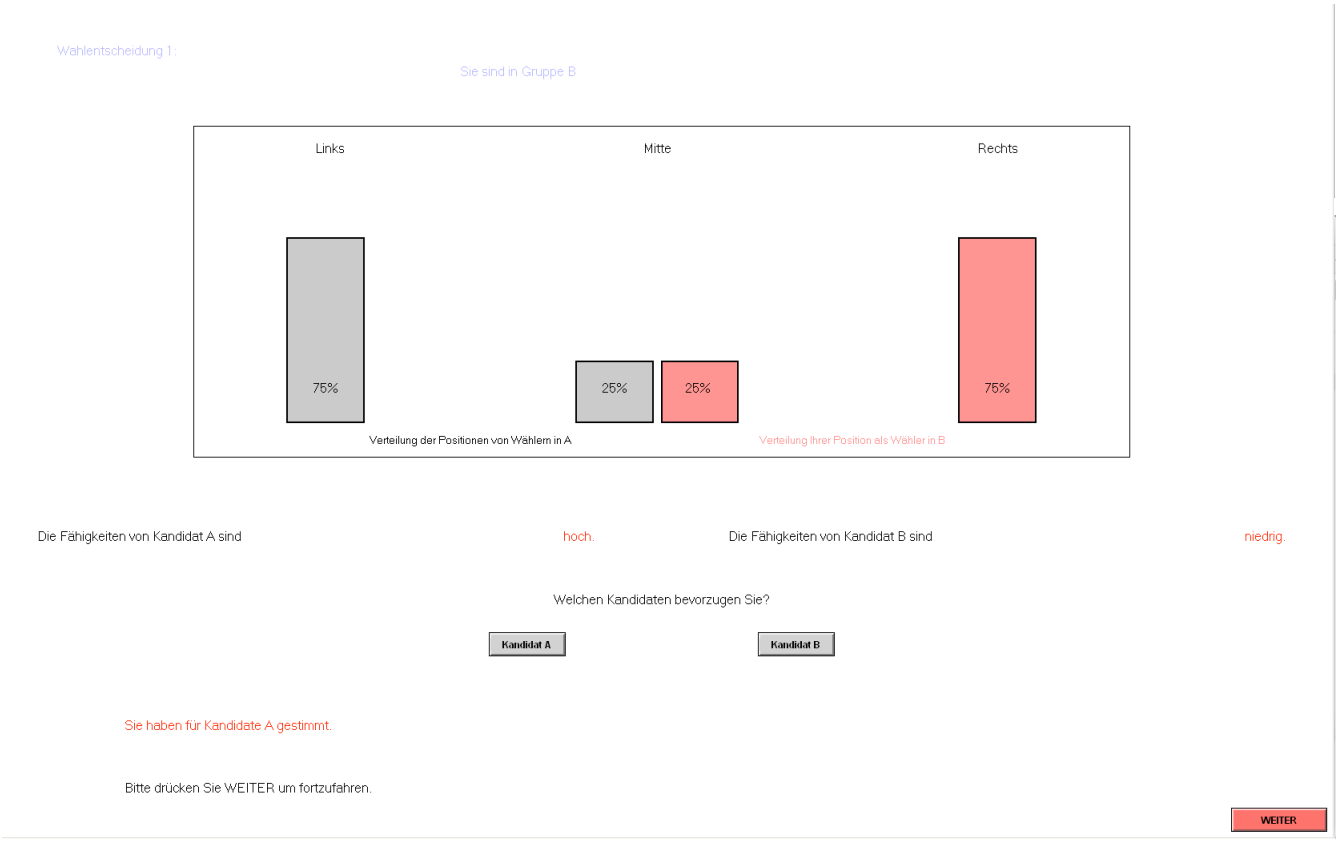


Figure C.2: Candidate decision screen