Race to the Top: How Competition for Political Power Affects Participation *

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Abstract

In politics, power is key. Engaging in competitive political environments and gaining political power through competition can have significant ramifications on an individual's financial and interpersonal life and influence how individuals behave politically. I hypothesize that competition for political power causes voters to place more value on the importance of participation and it triggers a strong desire to seek economic status by using power, which mobilizes political participation. Using behavioral theory and three laboratory experiments, I find evidence supporting these effects. I take special care to distinguish these effects from those induced by endogenous formation of group identity, strategic voting, and other compelling behavioral theories. Substantively, I discuss the implications of these findings in the context of how the civil rights movement affected Black voters' participation, how the process of immigration impacts immigrants' political behavior, and how empowering women in the political processes influences women's participation.

Keywords: Power, Political Competition, Voting, Institutions, Laboratory Experiment

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Political power is vital (Pikulina and Tergiman 2020). Power can increase influence over decision-making, access to scarce resources, and the number and quality of social interactions one has. Political power is typically earned and maintained through competitions between rivals in most aspects of daily life, in legislative chambers and democratic campaigns but also in office politics at various institutions (Chaudoin and Woon 2018; Diermeier and Li 2019). The results of these formal and informal competitions can have significant ramifications on an individual's financial and interpersonal life (McClendon 2018; Kasara and Suryanarayan 2015; Mayer 2011; Akee et al. 2020). For this reason, earning political power through a competitive process could have considerable implications for how individuals behave politically (Michelitch 2015; Druckman and Lupia 2016; Minozzi and Woon 2016; Moskowitz and Schneer 2019; Buisseret and Prato 2022).

I hypothesize that competition for political power causes voters to place more value on the importance of participation and it also triggers a strong desire to seek economic status through the use of power, which mobilizes political participation. Neither of these hypotheses has been previously established in the literature. In naturally occurring situations, it is challenging to precisely identify the aforementioned effects because an exact counterfactual is unobservable. Moreover, political power is hard to measure and record, and the process of earning power is even more difficult to construct using historical or contemporary data. I thus conduct three laboratory experiments to bypass these challenges and test these hypotheses.

Each of the three experiments consists of a Control and Treatment condition. First, participants in each group were assigned to work on a task (hereafter, Task Stage), then participated in a series of voting games (hereafter, Voting Stage) used to study participation. There is a key difference between the conditions. In the Control condition, political power, represented by how many ballots a voter has, is arbitrarily assigned and cannot be competed for, regardless of their performance in the Task Stage. In the Treatment condition, a participant's relative performance in the Task Stage determines their political power, so a poor performance in the Task Stage results in having less voting

power, and vice-versa. I then identify the effects of competition for political power by comparing the differences in participation in the Voting Stage between the Control and Treatment conditions.

In Experiment I, to examine the behavioral consequences of competition for political power, I establish an environment in which there is a group of *high-power* voters who are the minority of the electorates. Each high-power voter has more ballots and higher expected earnings than the *regular-power* voters who constitute most of the population. The high-power group and the regular-power group both vote to decide distributive policies. I use ballots to represent political power since having more ballots than others is one of the more straightforward ways to demonstrate the advantages of high-power voting. Because power is relative (Parsons 1963), every voter has at least one ballot in my setting.[1] I find that compared to the Control condition in which competition for power is not an option, participants in the Treatment condition assign a significantly higher value to their political participation and, thus, vote more frequently regardless of whether they earned high-power or regular-power.

The political power earned through competition might construct a base for identity politics. Whether individuals are high-power or regular-power voters determines a common trait within their group identity that differentiates them from other voters. Group identity can mobilize voters (Schnakenberg 2013; Landa and Duell 2015; Bassi et al. 2011). While group identity exists both in the Control and Treatment conditions, since identity is endogenously formed when individuals compete for power, the Treatment is expected to strengthen their development of group identity. To understand the extent to which the results of Experiment I are driven by identity effects, I conduct Experiment II. Here,

[1]In measurement terms, political power has a non-zero value. In most democratic scenarios, one can have low political power, but this is distinct from having no power at all, as a value of zero would imply. This measurement choice also facilitates Experiment II, which is designed to isolate the effects of competition for political power from those induced by other compelling behavioral theories.

I mimic the design of Experiment I and maintain competition that creates an advantaged group, but all voters have one ballot in Experiment II, regardless of their group. Thus, competition into the advantaged group is not for power. Then, in Experiment II, I keep the channel of how identity effects may affect voting, but I isolate them from the effects of competition for political power. I find no evidence that endogenous group formation or selection effect leads to the findings identified in Experiment I.

I also wish to understand whether competition for political power directly mobilizes both high-power and regular-power voters' participation or if one group's voting indirectly affects the voting of another. I thus conducted Experiment III to isolate the channels through which decisions may be influenced by strategically responding to outgroup voting. I find that when outgroup behavior is unobservable or unpredictable, competition for political power has similar effects as identified in Experiment I, which implies that power competition imposes direct effects on both high-power and regular-power voters.

The behavioral theory and experiments of this research can help explain, across political contexts, why individuals who directly or indirectly engaged in competition for political power are more likely to participate and use their influence. To demonstrate the implications of this study, I map the substantive results of these experiments onto historical and current political phenomena in which competition for political power is highly relevant. Specifically, I discuss the implications of my findings in the context of the civil rights movement and Black voters' political participation, the impacts of immigration on immigrants' political behavior, and how women's institutional empowerment influences women's participation.

Competition for Political Power and Participation

In order to construct a conceptual framework for anticipating how competition for power affects political behavior, I follow Sandel (2020) and consider two model societies. The first society is a so-called *aristocracy* in which individuals' political power is arbitrarily

determined by birth (i.e., race, gender, caste, or the family or country they were born). The second society is a *meritocracy* in which how much political power one has is the result of what people have earned through effort and competition.[2] Individuals in meritocracy will exert more effort as compared to in aristocracy where earning political power is not an option, because people need to outperform competitors to become the minority who have high-power. The competitive process makes it clearer that there is a non-random mapping from individuals' performance to their level of political power, and one has the ability to change one's own fate through the political competition process. The nature of meritocracy and in particular competition for political power is likely to promote participation through two related but distinct perspectives.

Earning political power, as opposed to arbitrarily receiving or inheriting it, raises the intrinsic value of political behavior. I argue that individuals should value political power more when they can earn it through competition. This is because when competition for political power is possible, individuals more actively determine their political status by themselves. What matters is not how much power they have earned in the competitive process, but how the allocation of political power is determined. If one ascended to the apex of the power pyramid (i.e., the high-power group) through effort and merit, it brings a sense of achievement for having earned one's place, and one can take pride in the fact that her or his success was not a result of luck as those who have high power in aristocracy (Sandel 2020). This by no means implies that people who navigate power competition without earning high-power (i.e. the regular-power group) will devalue what they earn. Those at the bottom tier of the aristocratic society are unlikely to change their political status and may therefore place little intrinsic value on their arbitrarily determined status. However, those in the meritocratic society have the opportunity to change their status, even if they find themselves at the bottom of the power pyramid. As a result, merit-based

[2]While I use these terms to illustrate the conceptual framework of how competition for political power affects political behavior, a study of political behavior under the aristocratic rule is outside of the scope of this study.

competition for power leads one to adopt a more active role in the political environment (Solt 2008) and is likely to increase people's interest and engagement in politics (Schwartz and Boehnke 2004). As the goal and reward of the competition is political power, the competitive process will induce individuals to place more value on using power, which increases their political participation.

Moreover, the process of competition for political power may trigger a stronger desire to seek economic status through the use of political power (Parsons 1963). It should be noted that political power often closely correlates with economic outcomes. As illustrated by agricultural subsidies, the international trade deals, and the distributional benefits from an economic stimulus plan, most public policies are seen as benefiting some at the expense of others. This highlights an economic friction in democratic politics: individuals and social groups may use their political power to influence the allocation of economic resources in their favor (Ansell and Samuels 2014). For this reason, economic outcomes inevitably become considerations in political competitions. The ultimate goal of political participation, thus, is not only about the execution of power but also using it to influence economic outcomes.

Regardless of who wins or loses in the competition for political power, both the high-power and regular-power individuals in meritocracy are more motivated to seek economic status by using their power than those in aristocracy. Due to the rivalrous nature of political power, relatively few individuals gain an advantaged political status from competition. However, those who lose the competition for power are not necessarily more likely to abstain from the political process altogether. As a majority, they are more likely to use their power, because they can still influence policy outcomes through voting and, as a result, improve their economic conditions. People who navigate competition for political power may be more willing to use their power in electoral competition to influence the margin of victory of their favored policy. In addition, those who achieve a high status through political competition are more likely to use their power to extend their privileged position from politics to the economy. Previous studies find that competition for status

makes individuals more self-interested (e.g. Charness et al. 2014) and increases envy and spite (McClendon 2018). This would suggest that individuals who earned their high-power through effort and competition are more likely to take advantage of their political power to influence the economy, even at the expense of aggregate social welfare.[3] This leads to the following two hypotheses:

Hypothesis 1 *Competition for political power causes individuals to place more value on the use of political power, which increases their political participation.*

Hypothesis 2 *Competition for political power triggers a stronger desire to seek economic status through the use of power, which increases individuals' participation.*

Experiment I

In Experiment I, we establish whether there are effects of competition for political power on voting behavior. I focus on voting power, which is one of the most important forms of political power. To test my hypotheses, I must design experimental treatments that allow for the operationalization of the key treatment variable: *whether competition determines the assignment of voting power*. To simulate incentives for competition, I establish two political groups in voting. In one, members have high power (by having more ballots); in the other, members have regular power. When participants can compete for voting power in the Treatment condition, they engage in a competitive task and those who performed relatively better are ranked high, and thus assigned to the high-power group. In the Control condition, participants engage in the same task before their political power is determined. However, in the Control condition, the assignment of political power is arbitrary and independent of participants' performance.

[3]See Gilens and Page (2014) for related discussions on how economic elites and interest groups translate their economic power into politics and influence public policies.

Procedures and Implementation

In both the Control and Treatment conditions, at the beginning of a session, participants are told that the experiment consists of two stages. First, participants engage in a Task Stage in which they are asked to do a counting-zero task (Abeler et al. 2011) for fifteen minutes. Participants count the number of zeros in tables containing 150 randomly ordered zeros and ones, with performance recorded according to a point system in which correct counts receive one point. To attract subjects' attention and incentivize them to concentrate on the task, we pay participants a flat payment for working on the task both in the Control and Treatment conditions. The incentive scheme in the Task Stage is not effort-based, which should not affect the identification of treatment effects in our experiment. When the Task Stage is concluded, participants receive feedback on their performance. Participants are ranked based on their task performance and then grouped based on the treatment being tested. It should be noted that in the Control condition those assigned to the high-power group are not necessarily the high-performers of the Task Stage. Thus, *the Task Stage is a competitive process in the Treatment but not in the Control condition.*

In each session, the Task Stage is performed once. After the Task Stage, participants engage in a collective decision-making process referred to as the Voting Stage. I consider two groups between which there is an asymmetry in political preferences and political power. Specifically, there are two voters in the high-power group (labeled as Group A) and three voters in the regular-power group (labeled as Group B). Once participants are assigned to a match of 5 voters and their roles as Group A and Group B voters are determined, it is fixed throughout the session. There is no rematching. Each Group A member has *two* ballots while each Group B member has *one* ballot.[4] The number of

[4]Each Group A voter has more ballots than each Group B voter, and although Group A is the minority, in total Group A voters have four ballots while Group B voters have three ballots. In this study, I consider a setting in which voters have no initial political

each type of voter and the distribution of political power are common knowledge to all.

In the experiment, I consider voting games with policies of different implications. These policies establish (i) the size of a pool of experimental currency units (ECUs) to be distributed to subjects, and (ii) the amount allocated to each member of Group A relative to the amount allocated to each member of Group B. All voters simultaneously and privately choose one of three options: *abstain*, *vote for Policy A*, or *vote for Policy B*. If an individual voted in a period, a fixed voting cost (three ECUs) is deducted from one's earnings in that period. If a Group A (B) member votes for either policy, her two (one) ballot(s) are for that policy. The group decision is determined by selecting one ballot at random.[5] If the selected ballot voted for Policy A (B), then Policy A (B) is declared the winner; if the selected ballot is an abstention, then an additional ballot is drawn until a winner is determined. In the case that all voters abstain, then each policy wins with a probability of 50%. The probabilistic voting rule has three advantages. First, it helps to identify a unique symmetric equilibrium of the voting games. Second, it is relatively easy for subjects to understand the pivotal probability in a voting game if they desire to make relevant calculations, and thus, it facilitates experimental control over pivot probabilities. Third, it introduces randomness that helps to relax the artificial condition that voters know the exact distribution of political power and voter types, and it results in some uncertainty over the outcome of the voting which mirrors the scenario in real-world politics. That is, because of random shocks or variations, there is a probability that a "black swan event" occurs and the underdog could win the election.

The Voting Stage consists of 40 periods. We conduct two types of voting games as two blocks (i.e. the first 20 periods are for one game and the next 20 periods are for another game). The sequence of the two types of voting games is switched across sessions to avoid order effects. After each period, participants receive feedback that summarizes

endowment.

[5]Similar experimental protocols are used in, for example, Feddersen et al. (2009) and Morton and Ou (2019) to study voting behavior.

the distribution of turnout. A voter's own payoff is displayed on the screen, broken down into three parts: the winner of the period, the vote count for Policy A and Policy B, and the payoff of the voter in that period. When the Voting Stage is finished, four periods - one in every ten periods - are randomly selected as the basis to calculate earnings in the Voting Stage, and participants are paid based on the combination of whether they vote and the voting outcome. A post-experiment survey is conducted to elicit participants' values on political participation, social preference, and their demographic information. The experiment is programmed using z-Tree (Fischbacher 2007) and conducted at a large U.S. university. One hundred and sixty (160) undergraduate student subjects participated in either the Control or Treatment condition of Experiment I. Sessions average approximately 60 minutes each. The average total payment, including a $7 show-up fee, is about $18.

Identification Strategy

The design of competition for political power in voting games is based on three considerations. First, in measurement terms, most political power has a non-zero value. One can have low power, but this is distinct from having no power at all, as a value of zero would imply. Hence, while the high-power group has more ballots, the regular-power group can still use their ballots to influence the voting outcome, which captures the characteristics of most democracy in naturally occurring elections. Second, I desire to design an experiment that is relatively easy to explain to participants, especially the key message that they have higher political power and advantages as members of the high-power group. Having more ballots than the voters of the regular-power group in voting games is one of the more straightforward ways to relay to participants the advantages of high political power. Finally, I wish to control for the benefits of greater voting power and establish a clean measure of the effects of competing for power on participation. For this reason, the same distribution of ballots is applied to every treatment.

I design two different types of voting games represented in Table 1. Specifically, in

Voting Game 1 (hereafter, VG1), when Policy A wins, each Group A voter receives 25 and each Group B voter receives 10; when Policy B wins, each Group A voter receives 10 and each Group B voter receives 20. The minimum payoff for Group A is the same as for Group B. As there are two Group A voters and three Group B voters, the minimum payoff is always 10 and the aggregate payoff is always 80 whether Policy A or Policy B wins. So in VG1, the winning policy only impacts the distribution of payoffs between the two groups, but does not impact aggregate welfare. This design captures the conflict of interest in distributive public policies between social groups, as most public policies are seen as benefiting some at the expense of others (Pateman 1970). Because of these characteristics, VG1 is used as a benchmark to measure participation across treatments.

Table 1: Payoffs of Voting Games

	Winner of VG1		Winner of VG2	
	Policy A	Policy B	Policy A	Policy B
Each Group A Voter	25	10	25	25
Each Group B Voter	10	20	5	25
Minimum Payoffs	10	10	5	25
Aggregate Payoffs	80	80	65	125

However, in Voting Game 2 (hereafter, VG2), when Policy A wins, each Group A voter receives 25 and each Group B voter receives 5; when Policy B wins, each Group A voter receives 25 and each Group B voter receives 25. Thus, Policy B is designed to be a morally and socially desirable policy (Feddersen et al. 2009), because when Policy B wins it increases the minimum payoff of the losing group from 5 to 25, and increases aggregate payoffs from 65 to 125. Importantly, because whether Policy A or Policy B wins each Group A voter receives 25, Group A voters should be indifferent between the two policies. Moreover, because of the voting cost, Group A voters should abstain. However, when the intrinsic value is sufficiently high, Group A voters may vote in VG2. The proportional difference of Group A's voting between the Control and Treatment conditions should reflect the change of participation preference. Notice that there is a salient earning difference between Group A and Group B voters when Policy A wins, but Group A

and Group B voters have the same earnings when Policy B wins. As stated earlier, the economic friction in democratic politics decides that economic outcomes inevitably become considerations in the competition for political power. In VG2, Policy A winning means higher economic status for Group A voters. When a Group A voter is willing to take the cost and vote for Policy A, it suggests the voter wants to have higher economic status than the voters in the other group.[6] Since Group A is the political high-power group, then Group A's voting for Policy A may imply that they want to extend their privileged position from politics to the economy. Thus, VG2 is used to examine how competition for political power triggers individuals' desire to use their power to seek economic status.

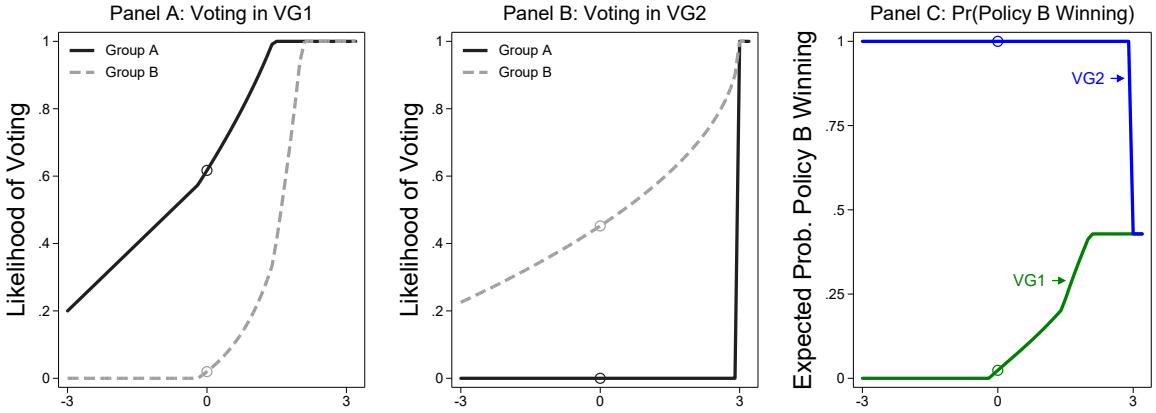
Regarding the identification of treatment effects, VG1 and VG2 are mutually reinforcing and complementary to each other. Without VG1, we cannot causally identify whether competition for political power influences the intrinsic value of political behavior and participation. Without VG2, we cannot precisely isolate how earning political power triggers a stronger desire to seek economic status. Thus, the design of VG1 and VG2 allows me to study how competition for political power promotes participation through two related but distinct perspectives.

Predicted Voting Behavior and Treatment Effects

Based on the setting of voting games, I develop a formal model (reported in Online Appendix A) and use the equilibrium results reported in this section to specify behavioral predictions that are tested through experiments. The theoretical analysis uses a pivotality voting model in which a voter is motivated by her individual assessment of the likelihood that her vote will be pivotal in the ultimate decision. In the voting games, any vote in favor of a policy increases the probability that such policy wins the voting game. Hence, conditional on self-regarding voting, Group A voters should vote for Policy A in VG1 and

[6]Alternative explanations are discussed and excluded in Experiment II.

be indifferent between policies in VG2, but Group B voters should always vote for Policy B both in VG1 and VG2. I solve the equilibrium voting behavior and the likelihood of Policy B winning and illustrate them in Figure 1. Based on these results, I expect that when the behavioral and psychological utility of voting is not considered (i.e., equals zero in Figure 1), Group A voters should vote more frequently than Group B voters in VG1; Group B voters should vote more frequently than Group A voters in VG2. Policy B should be more likely to win in VG2 than in VG1.



Note: In each figure, the horizontal axis show the intrinsic value gained from voting. It is positive (negative) when an individual values (devalues) political participation. Panels A and B represents the equilibrium voting of Group A (B) voters. Panel C represents the likelihood of Policy B winning based on equilibrium voting. The equilibrium voting is derived based on the voting model detailed in Appendix A. The calculations of the likelihood of Policy B winning are detailed in Appendix B.

Figure 1: Predictions of Voting and Policy Outcome

Individuals may receive intrinsic value in their political behavior through the psychological utility gained from voting, which is expected to promote participation for both Group A and Group B voters. Including the intrinsic value of voting into the voting model, I find a monotonic relationship between the value and voting as illustrated in Panels A and B of Figure 1. When the intrinsic value is sufficiently large, all voters should vote. Competition for political power is expected to cause individuals to place more value on the use of voting power, as theorized in the conceptual framework and highlighted in Hypothesis 1. Thus, as individuals who compete for political power assign a higher intrinsic value to voting, they are more likely to vote in the Treatment than those in the Control condition. Moreover, as discussed in Hypothesis 2, competition for

political power is likely to trigger a strong desire to seek economic status through the use of political power, which also increases individuals' participation. The dynamics of Group A and Group B voters' interactions are shaped by how they compete for political power, which determines the probability that the majority-preferred policy (Policy B) is chosen by democratic decision-making, which is illustrated in Panel C of Figure 1.

Results of Experiment I

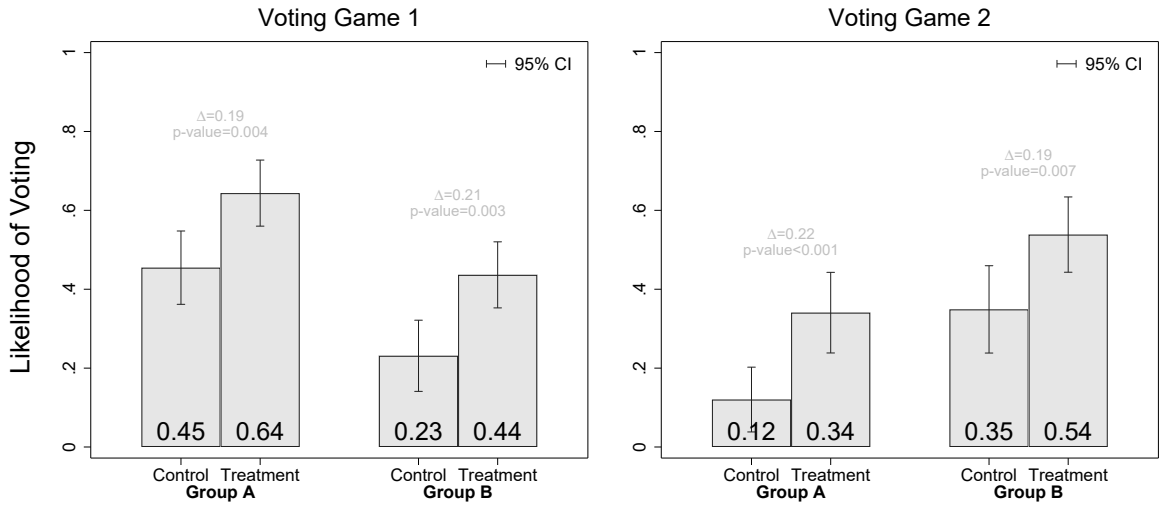
In this section, I first analyze voting behavior by group and treatment, then present the self-reported valuation of participation and status from the post-experiment questionnaires, and finally evaluate the expected policy outcomes. Recalling that subjects were allowed to vote for A, vote for B, or abstain. Political participation is measured by the average frequency of voting for each group's favored policy in each treatment.[7] I cluster the analysis at the electorate level and conduct two statistical tests to investigate the likelihood of voting. I conduct a regression-based statistical analysis that uses all observations and cluster-robust standard errors that allow for arbitrary correlation between observations from the same electorate. I also perform an analogous but arguably more conservative non-parametric test (i.e. Mann-Whitney Wilcoxon) that uses electorate averages to investigate treatment effects.[8] All statistical tests are two-sided even though my hypotheses predict treatment effects in specific directions.

Participants were significantly more likely to vote in the Treatment than in the Control

[7] *Other-party voting*, i.e. Group A's voting for Policy B or Group B's voting for Policy A, is rare and observed in less than 2% of time. Most other-party voting occurred in the first five periods; the likelihood of other-party voting is similar across treatments. More details are reported in Online Appendix D. Including or excluding other-party voting in the measurement of participation does not change the main findings.

[8] Unless otherwise specified, in the main text I report the results of the Mann-Whitney Wilcoxon test only. Online Appendix E contains additional results of the regression-based analysis.

condition. The significant effects on aggregate voting can be seen in Figure 2. In VG1, Group A voted about 45% of the time in the Control and 64% of the time in the Treatment condition; Group B voted about 23% of the time in the Control and 44% of the time in the Treatment condition. In VG2, Group A voted 12% of the time in the Control and 34% of the time in the Treatment condition; Group B voted about 35% of the time in the Control and 54% of the time in the Treatment condition. The difference of each pairwise comparison is statistically significant at the one percent level. Within each treatment and comparing Group A and Group B voters' voting, as expected, Group A voted more frequently than Group B voters in VG1 (45% vs 12%, $p < 0.001$; 64% vs 34%, $p < 0.001$), but Group B voters were more likely to participate in voting in VG2 than in VG1 (23% vs 35%, $p = 0.004$; 44% vs 54%, $p = 0.052$).



Note: The numbers at the bottom are the average voting rates of the voters under that bar. The label below each set of bars shows voter groups. The two left (right) sets of bars reflect average voting in VG1 (VG2). The reported p-values are the result of the Mann-Whitney Wilcoxon test on electorate avgs. Online Appendix E reports the results of the regression-based analysis with 6,400 individual observations.

Figure 2: Likelihood of Voting by Voting Game and Treatment

The altered voting behavior suggests changes in how much an individual values the importance of participation, which are reflected in self-reported beliefs elicited in post-treatment survey. As reported in Figure E1, participants value the importance of political participation significantly higher in the Treatment than in the Control condition, which

holds for both Group A and Group B voters. These results provide supporting evidence for Hypothesis 1 that competition for political power promotes political participation.

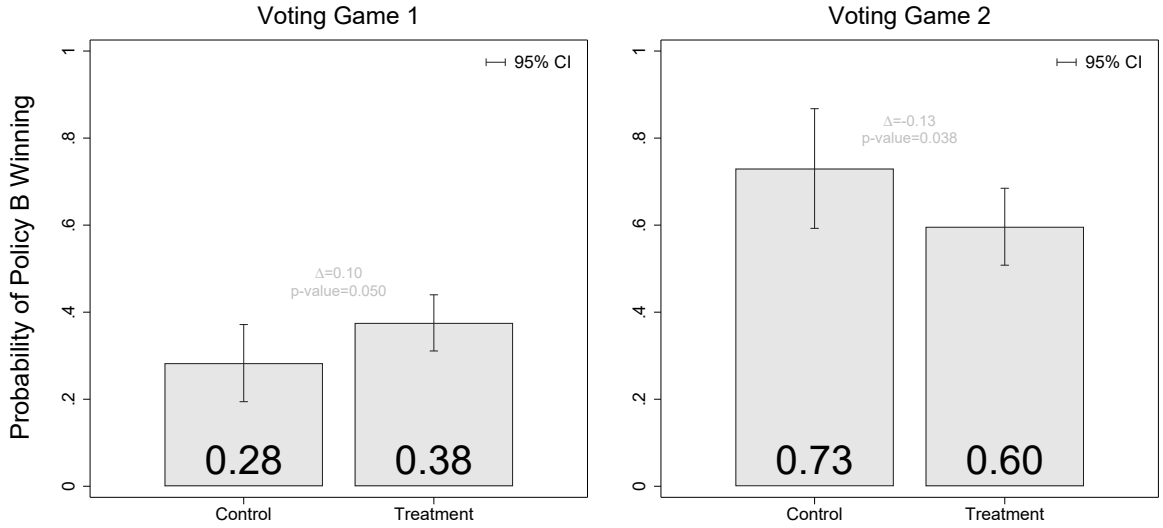
Competition for political power also triggers a strong desire to seek economic status through the use of political power. Recall that VG2 is designed to identify the high-power and advantaged group's desire to out-earn than the others. Since Group A voters receive the same monetary payoff whether Policy A or Policy B wins, what they vote for should reflect the high-power group's motivation. Three distinct motivations may drive Group A's voting: They may vote for (1) Policy B, because they have moral bias and Policy B is the moral policy, (2) Policy A, because competition strengthens a common trait among Group A voters, which motivates them to vote for their group's favored policy, or (3) Policy A, because earning political power triggers status-seeking and thus makes them vote for policies that improve their economic status.

Few Group A voters voted for Policy B, so voting morally is not representative in my experiment. Most of Group A's vote in VG2 is for Policy A. In the Control condition, Group A voted for Policy A only about 12% of the time, but in the Treatment condition, Group A voted for Policy A about 34% of the time (12% vs 34%, $p < 0.001$). Voting for Policy A in VG2 comes with drawbacks. There is a personal cost associated with voting, but also a social cost, as Policy A is socially undesirable. In Experiment II reported in the following sections, I disentangle these findings from the endogenous formation of group identity and selection effects. None of these alternative behavioral theories can explain the finding highlighted in Experiment I. Then, the increased voting for Policy A in VG2 from Group A voters should be explained by status-seeking. Choosing to vote for Policy A in VG2 may suggest that a Group A voter prioritizes achieving higher status for themselves above all else. Moreover, how much an individual values the importance of earning more than the others was also elicited in the post-treatment survey. As illustrated in Figure E2, it is significantly higher in the Treatment than it in the Control condition. These results support Hypothesis 2.

The altered voting caused by competition for political power affects expected policy

outcomes (calculated based on votes, not the realized outcomes stochastically determined in the experiment), which is illustrated in Figure 3. In the Control condition, Policy B was expected to win about 28% of the time in VG1 and 73% of the time in VG2. In the Treatment condition, Policy B was expected to win about 38% of the time in VG1 but 60% of the time in VG2. As predicted, in both the Control and Treatment conditions, Policy B was expected to win significantly more frequently in VG2 than in VG1 at the 0.001 level. With respect to the main treatment effects, I find that in VG1, Policy B was expected to win significantly more in the Treatment ($p = 0.050$), but in VG2, Policy B was expected to win significantly less in the Treatment ($p = 0.038$). These results are consistent with the predictions illustrated in Figure 1c.

Notice that in VG1, the majority-preferred policy is more likely to win in the Treatment condition because when Group B voters (the majority of the population) participate more and vote for Policy B more frequently, Policy B is more likely to win. Since VG1 captures the most common scenario in democratic decisions, namely the distribution of resources and wealth among social groups, this result implies that competition for political power has a positive influence on political participation and the health of democracy in contexts similar to VG1. However, as illustrated in Figure 1, when the intrinsic value of using power and/or when the importance of earning more than the others are sufficiently high, in VG2, Group A voters who are driven by status-seeking are likely to vote for Policy A, and the likelihood of Policy B winning decreases as Group A's voting increases. Group A's influence on policy outcomes in VG2 can be compared to that of interest groups, political elites, and those with vested interests. These groups wield a great deal of leverage over elections, and they may use it to push for policies that further increase their status (Gilens and Page 2014). Thus, in political processes captured by VG2, competition for political power may reduce the likelihood of the morally and socially optimal policy winning.



Note: The numbers at the bottom are the expected likelihood of Policy B winning. The reported p-value is the result of the Mann-Whitney Wilcoxon test on electorate avgs. Online Appendix E reports additional results of the regression-based analysis with 1,280 individual observations.

Figure 3: Expected Policy B Winning by Voting Game and Treatment

Finally, in the Task Stage participants solved more problems in the Treatment than in the Control condition (12.46 vs 10.33, $p = 0.039$). This observation reflects an incentive effect, since the competitive nature of the Treatment condition induced participants to work harder, and thus, competed for political power. To further investigate the robustness of the main findings, I conducted a logit regression analysis of individual voting as a function of the treatment variable and control variables. The results of this regression are reported in Table 2. The variable *TaskPerformance* reflects the number of questions solved correctly in the Task Stage, and it imposes a positive and statistically significant influence on the likelihood a participant voted. These results suggest that the competitive process makes it clearer that there is a non-random mapping from individuals' performance to their level of political power, and one has the ability to change one's own fate through the political competition process, which is in line with my conceptual framework. To conclude, although the control variables significantly affect voting behavior and the magnitude of the estimated treatment effects are slightly different across models, the main treatment effects are consistent and robust across Models 1-6 in Table 2.

Table 2: Effect of Treatment Variables on Voting Decisions

	Group A's Voting			Group B's Voting		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment = 1	0.132**		0.227**	0.221***		0.205***
	(0.056)		(0.101)	(0.056)		(0.059)
VG1= 1		0.362***	0.442***		-0.114***	-0.141***
		(0.037)	(0.073)		(0.026)	(0.036)
Treatment× *VG1*			-0.133			0.040
			(0.087)			(0.053)
TaskPerformance	0.016**	0.025***	0.017**	0.015**	0.014**	0.015**
	(0.007)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
# Observations	2,560	2,560	2,560	3,840	3,840	3,840
# Electorates	32	32	32	32	32	32
Log-likelihood	-1579.4	-1437.6	-1418.1	-2406.8	-2467.0	-2379.5

Note: Logit specification. For Group A (B) voters, the dependent variable is whether one voted for Policy A (B). *Treatment* is a binary indicator to represent whether individuals participated in the Treatment condition. *VG1* is a binary indicator that represents whether the voting game is VG1. All reported results are average marginal effects of logit regressions.
Control variables include period, age, gender, academic major, cognitive reflection ability, and competitiveness. Estimates of control variables are reported in Online Appendix E.
Standard errors are clustered at the electorate level and reported in parentheses.
Significance levels: $*: < 0.10$ $**: < 0.05$ $***: < 0.01$.

Experiment II

One may attribute my findings to endogenous formation of group identity. That is, the Task Stage highlights a common trait among the members of each group (either high-power or regular-power), which differentiates them from the members of the other group. Compared to the Control condition, participants' group identity in the Treatment condition is endogenously determined by their performance in the competitive task. The common trait of group membership may strengthen group identity, which may mobilize participation. Then, can the effects identified in Experiment I be explained by identity effects? I conduct Experiment II and report below that endogenous group formation cannot explain the change of voting.

All is held constant in Experiment II.[9] In both Experiment I and Experiment II, based

[9]Another 160 student subjects participated in Experiment II. None of them participated in Experiment I. The average earnings are about $18 in which a $7 show-up fee is

on equilibrium voting reported in Table 3, Group A voters should vote more frequently than Group B voters in VG1; Group B voters should vote more frequently than Group A voters in VG2. Policy B should be more likely to win in VG2 than in VG1. Individuals desire to become Group A voters because Group A voters' expected earnings are higher in both voting games.[10] In the Treatment condition of Experiment II, since participants compete to become Group A voters, the Task Stage also highlights a common trait among the members of each group and endogenously strengthens identity.

The only difference between Experiment I and Experiment II is the number of ballots each participant receives. In Experiment I, each Group A voter has two ballots, each Group B voter has one ballot but in Experiment II all voters have one ballot, regardless of their group. As a result, the competition to become Group A voters in Experiment II is not driven by the reason that Group A has more voting power. Therefore, I isolate the effect driven by competition for political power from the effect induced by endogenous group formation and keep everything else the same as in Experiment I.

I find no significant difference in participation between the Control and Treatment conditions. There is little difference in the self-reported valuation of the importance of participation and earning more than the others between the Control and Treatment conditions. If the results observed in Experiment I were explained by endogenous formation of group identity, then in Experiment II we should observe the same pattern of behavior. However, comparing treatment effects in Experiment II with treatment effects in Experiment I, there is little evidence supporting that voting behavior are significantly affected

included.

[10]To investigate if participants understood the advantages of being Group A voters, I compare the distribution and the mean value of Group A and Group B voters' Task Stage performance between Experiment I and Experiment II by treatment. There are no significant differences in these comparisons, suggesting that subjects in Experiment II are as capable of determining the advantages of being Group A members as subjects in Experiment I.

by endogenous group formation. Detailed results of Experiment II are reported in Online Appendix F.

Table 3: Comparison of Equilibrium Predictions between Experiments

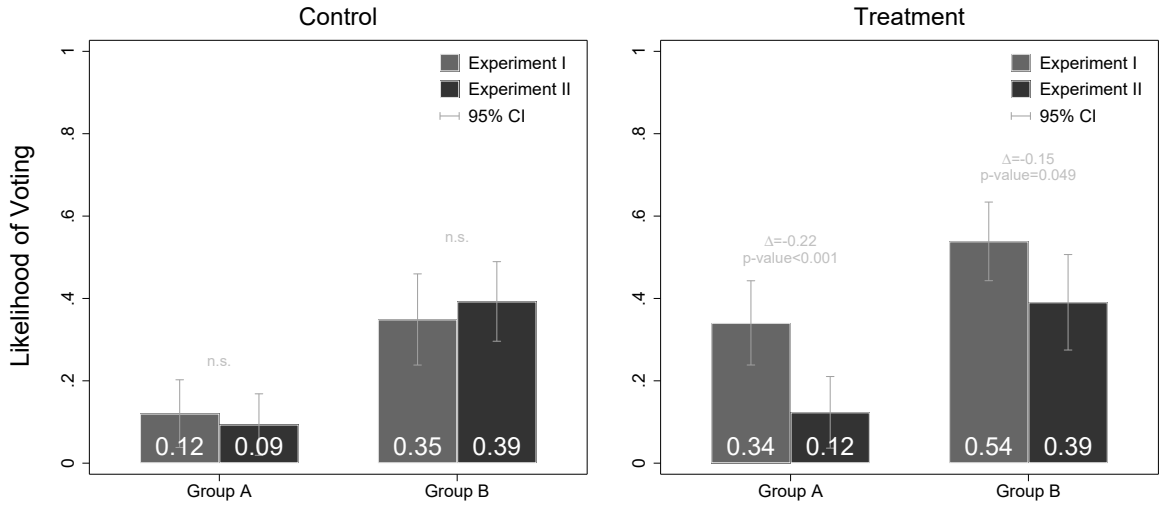
Experiments	Games	Equilibrium Voting		Prob. of Policy B wins	Expected Payoff of each	
		Group A	Group B		Group A	Group B
I	VG1	0.62	0.02	0.02	22.84	10.14
	VG2	0.00	0.45	1.00	25.00	23.65
II	VG1	0.72	0.24	0.33	17.89	12.58
	VG2	0.00	0.45	1.00	25.00	23.65

Note: We report the details of deriving equilibrium voting in Online Appendix B.

While the equilibrium predictions of voting in Experiment II are qualitatively the same as predicted behavior in Experiment I, as illustrated in Table 3, the point predictions are not exactly the same in VG1 across experiments. Specifically, in VG1, both Group A and Group B voters are expected to vote more frequently in Experiment II (0.72, 0.24) than in Experiment I (0.62, 0.02). The differences in point predictions of VG1 across experiments do not affect the identification of the behavioral effect within each experiment, since I identify treatment effects of competition by comparing the Control and Treatment within each experiment. However, the differences in VG1's point predictions across experiments complicates the comparisons between Experiments I and II because it is hard to identify whether the difference in equilibrium voting or the behavioral effect of competition causes the behavioral difference (if any). Thus, when comparing results between experiments, I only focus on the results of VG2 in which the equilibrium prediction about Group A's and Group B's voting (0.00, 0.45) is exactly the same in both experiments.

As illustrated in Figure 4, Group A's and Group B's voting is statistically identical in the Control of Experiment II (E2-Control) as in the Control of Experiment I (E1-Control). However, both Group A and Group B voters are more likely to vote in the Treatment of Experiment I (E1-Treatment) than in the Treatment of Experiment II (E2-Treatment). Recall that the only difference between E1-Treatment and E2-Treatment is that individuals can compete for voting power in E1-Treatment but not in E2-Treatment.

The zero-difference between E1-Control and E2-Control and significant difference between E1-Treatment and E2-Treatment disentangles the unique impact of competition for political power from endogenous identity formation. It also suggests that not all competitive environments increase political participation.



Note: The numbers at the bottom of the bars are the average voting rates. The label below each set of the bar shows voter groups. The two left (right) sets of bars reflect average voting in the Control (Treatment). The reported p-value is the result of the Mann-Whitney Wilcoxon test on electorate averages. Online Appendix F contains additional results of the regression-based analysis with 3,200 individual observations.

Figure 4: Comparisons of Voting in VG2 between Experiments I and II

Experiment III

Voters may have *strategic incentives* that cause *strategic effects* (Ou and Tyson 2021). Voting behavior in each group may be influenced by out-group behavior—voters may strategically turnout at a higher rate after observing high out-group turnout, in an effort to increase their likelihood of winning voting games and earning higher payoffs. In the identification of effects caused by earning power, I find that in each group voters are more likely to vote in the Treatment than in the Control condition. A question naturally arrives: Are both Group A and Group B voters' higher participation caused by competition for voting power? Or does competition for power causes one group to vote more frequently, which leads to a higher participation in the other? In particular, does the competitive

process cause those who earned regular-power to participate more in politics, regardless of the behavior of those who earned high-power? The answers to these questions are critical for us to interpret the implications of this study. I thus conduct Experiment III and report below that strategic effects cannot explain the results of Experiment I.

Two factors may lead to strategic effects. First, voters of one group can observe the voting behavior of the other and use such information to strategically respond in voting games. Second, voters may have a prior belief about the behavior of other voters and use this to make voting decisions. Experiment III is thus designed to isolate these two different strategic effects. I used similar settings, procedures, and sixty new participants recruited from the same subject pool used for Experiment I to conduct Experiment III. Again, the difference between the Control and Treatment of Experiment III is whether those who performed better and ranked higher in the Task Stage are assigned as Group A voters, each of whom has two ballots, and the others are assigned as Group B voters, each of whom has one ballot.

To isolate the strategic effects that may be caused by observing out-group voting, I let participants engage in voting for 15 periods and provided no feedback between periods. Participants played the voting games of Experiment I (i.e.m VG1 and VG2) and a new voting game VG3 in which each Group B voter receives 25 regardless of whether Policy A or B wins but each Group A voter receives 25 when Policy A wins and 5 when Policy B wins. Each of these three voting games was played for five periods. I randomized the sequence of these voting games across electorates to avoid order effects. Participants knew that voting results were determined by Group A's and Group B's voting from the same session. Detailed results of these 15 periods' voting (with no feedback) are reported in Online Appendix G. I find that Group A's and Group B's voting in both VG1 and VG2 is statistically identical to the results observed in Experiment I.

To further understand Group B voters' behavior in the absence of strategic effects, I focus on their voting in VG3, in which I completely removed Group B voters' strategic incentives of voting, since whether Policy A or Policy B wins, each Group B voter always

receives 25. Hence, Group B's voting in VG3 is not driven by strategic incentives, because Group A's voting does not affect a Group B voter's payoff. Recall that in VG2, Group A voters have no strategic incentives to vote because each Group A voter receives 25 regardless of Policy A or Policy B wins. Based on the results of VG2 and VG3 within the first 15 periods (with no feedback) in Experiment III, I find that both Group A and Group B voters participate at a significantly higher rate in the Treatment than in the Control condition.

After participants played voting games for 15 periods *with no feedback*, I let them play VG1 and VG2 for 40 periods (20 periods each) with feedback. To disentangle the strategic effects caused by prior predictions of out-group voting behavior, in these 40 periods, voting results were jointly determined by the votes of a group from previous sessions. Specifically, for Group A voters, voting outcomes were decided by their participation and the votes of Group B voters from a previous session of Experiment I, and vice-versa for Group B voters.[11] Participants in the Control and Treatment of Experiment III knew that the feedback on the other group's voting was randomly drawn from different subjects of previous experiments, which means neither their prior belief nor the feedback of previous periods plays an effective role in strategically responding to the voting of the other group. Detailed results of Experiment III (interacted with unpredictable voters of previous experiments) are reported in Online Appendix I. I find both Group A's and Group B's likelihood of voting, whether in the Control or Treatment, or in VG1 or VG2, is statistically identical to the results of Experiment I. Taking these findings together, I conclude that the treatment effects observed in Experiment I are driven by competition for political power rather than strategic effects.

[11]To make sure the voting choices of previous participants were unpredictable by participants of Experiment III, I created a data set of 40 periods of decisions (20 periods for VG1 and 20 periods for VG2), by randomly drawing voting decisions of Group A and Group B voters from both the Control and Treatment sessions of Experiment I. This data set was used in both the Control and Treatment of Experiment III.

Discussion

In this section, I discuss alternative explanations and explain why they are unconvincing from multiple perspectives.

Merit, Compositional Difference, and Selection Effect

In both the Control and Treatment conditions, participants engage in a Task Stage, and it generates a performance-based ranking. In Experiment I, compared to the Control, political power is assigned in a merit-based manner in the Treatment. Would non-meritocratic competition affect political participation similarly as meritocratic competition? To explore this question, I conducted a non-meritocratic treatment using similar settings of E1-Control and twenty new participants recruited from the same subject pool used for Experiment I. Recall that in E1-Control, participants engage in the Task Stage first, even if their Task Stage performance does not determine whether they are assigned to Group A or Group B in the Voting Stage. In the non-meritocratic treatment, I remove the Task Stage; participants engage in the Voting Stage directly with randomly assigned group membership. I find that Group A and Group B voters' participation rates in the non-meritocratic treatment are not significantly different from their participation rates in E1-Control, which suggests that competition for political power increases participation only when it is meritocratic.

When voter-group membership is determined by ranking, a natural outcome is that only high-performing individuals become Group A voters in the Treatment, but in the Control, some high-performing players are randomly assigned as Group B voters, and some low-performing players are randomly assigned as Group A voters. As reported in Table 2, participants who solved more problems in the Task Stage are significantly more likely to vote. Given this, does such compositional difference (that may be associated with selection effect) confound the identification of my main effects? If those who performed better are different from those who performed relatively worse, then the findings

observed in Experiment I may be a result of compositional difference of voters between the Treatment and Control. However, this explanation is unconvincing for several reasons.

First, in Experiment I both Group A and Group B voted more in the Treatment than in the Control condition, and as investigated in Experiment III, Group B's higher participation is driven by competition for power rather than strategic effects. Thus, compositional difference and selection effect cannot explain the higher participation of both groups' voting. Second, by examining the demographic information of Group A and Group B voters in the Treatment of Experiment I, I find no evidence that Group A voters are different from Group B voters in their age, distribution of academic majors, gender, cognitive reflection score, self-reported competitiveness, and GPA. Recall that the counting-zero task used in this study has minimum requirements on skills. Thus, high-performing individuals are not necessarily different from low-performing participants.

Importantly, neither compositional difference nor selection effect can be the main reason for how competition for political power increases participation, because otherwise we should observe the same treatment effects both in Experiment II and Experiment I, given the same rank-determining institutions are used in both experiments and the average number of questions solved correctly by Group A and Group B voters are statistically identical between the two experiments. While there may be latent behavioral factors that could be associated with selection effect, there is no evidence that any effects highlighted in this study other than competition for voting power could explain the reported findings. The different findings between Experiment I and Experiment II may also suggest that not all competitive environments increase participation. It does, however, promote participation when competition is about political power.

Elicitation of Post-Treatment Values

The survey data on how participants value the importance of voting and economic status complement my analysis of voting data and further support my hypotheses. All the survey questions were asked post-treatment. Then, do Group A and/or Group B voters

report higher values in the Treatment than in the Control in Experiment I because of the interactions with out-group voters? To understand the influence of voting interactions on self-reported values, I asked the same survey questions in Experiment III after participants played voting games for 15 periods *with no feedback*. Detailed results of survey data are reported in Online Appendix H. I find that the survey data in Experiment III (that was not influenced by feedbacks on interactions among voters) are statistically identical to the survey data in Experiment I, which eliminates the aforementioned concerns.

Noise Effects and "Mistakes"

Finally, one might question whether the treatment effects observed in Experiment I are stochastic noise effects. Since the experimental observations are different from Nash equilibrium predictions, one may attribute the treatment effect reported in Experiment I to errors or "mistakes." Using a quantal response equilibrium analysis (McKelvey and Palfrey 1995 and Goeree and Holt 2005), I explore how adding a noise response parameter that reflects the error rate into the equilibrium analysis can explain the experimental results. The analysis is available in Online Appendix C. I find that even if we consider the symmetric noise and potential "mistakes" that subjects may make in voting, the quantal response equilibrium predictions still depart from experimental observations, which suggests that stochastic noise effects cannot explain my findings.

Mapping the Experiments to Applications

Political competition is ubiquitous in human society, and history is littered with competitions for political power. Understanding how this competition affects political behavior across groups and contexts will help scholars understand why participation in political competition and behavior varies. In this section, I explore three well-studied substantive applications of my conceptual framework and demonstrate their consistency with my experimental results. Clearly, the experiments are not designed to capture all of the many

complications and nuances inherent to naturally occurring political phenomena, but my results offer insight into the effects of competition for power at the micro level and thus provide a new avenue of inquiry for future studies.

Influence of the Civil Rights Movement

The American civil rights movement of the 1950s and 60s overturned legal segregation and Black voter suppression, and as a result dramatically increased black political rights. The movement's "social and political legacy" has shaped U.S. electoral politics (Andrews 2018) and encouraged active participation in world affairs and U.S. foreign policy among African Americans (Clemons 2010).

The expansion of political rights due to the movement had a direct influence on political participation. In presidential elections, Black voters were significantly less likely to vote than white voters in 1960. Ashenfelter and Kelley Jr. (1975) find that in 1972, this gap became statistically insignificant, suggesting that the Black voting rates increased significantly after the civil rights movement. Holding socio-economic characteristics constant, Ashenfelter and Kelley Jr. find that the differences in voting rates between Black northerners and those in southern states specifically covered by the Voting Rights Act of 1965 disappear between 1964 and 1972. However, rates among white voters in the north and in states covered by the Act remained consistent. Notice that before 1965, Black voters in the northern states can vote but those in the southern states cannot vote. Using my theory to explain Ashenfelter's and Kelley Jr.'s findings, since Black voters in states specially covered by the Act earned political power through the civil rights movement, they are likely to place higher value on the use of political power and participate more in the subsequent elections, which leads to the disappeared difference in voting rates between Black northerners and those in the southern states.

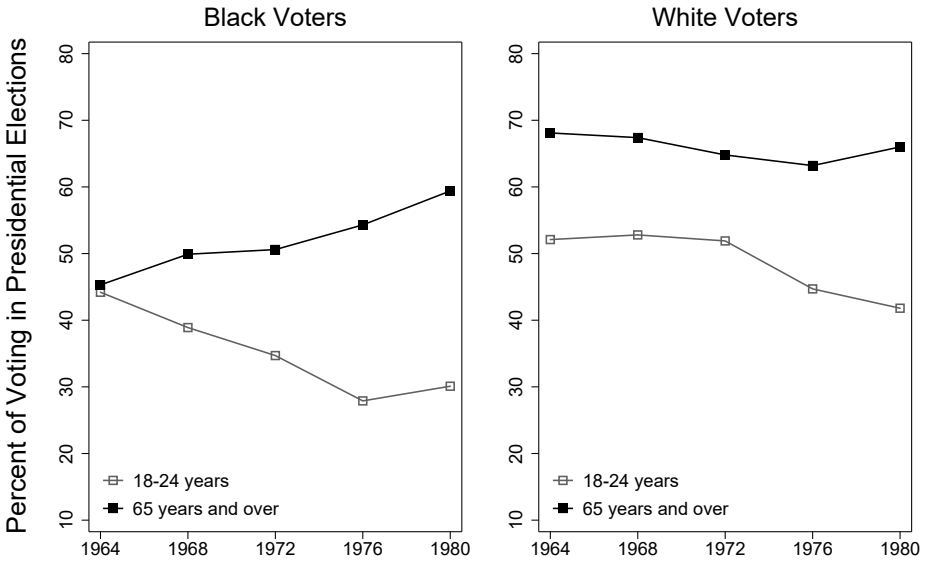
Moreover, the civil rights movement had differential effects on political participation across generations. As illustrated in the left panel of Figure 5, older generations, who were more likely to have experienced segregation and engaged in the civil rights movement (i.e.,

65+) were constantly and increasingly more likely to participate in presidential elections from 1964 to 1980. Conversely, younger generations (i.e., 18-24 years), born after the end of legal segregation with the protections granted by the Voting Rights Act and other civil rights legislation, were less and less likely to participate over time.[12] Importantly, the voting rates of these two generations of Black voters were approximately the same in 1964. Meanwhile, compared to the generational differences among white voters demonstrated in the right panel of Figure 5, the turnout rate of the elder white voters is relatively constant over time, with a slight decrease from 1964 to 1980, which is the opposite pattern of elder Black voters. Comparing the generational differences among Black voters and white voters, we find a unique effect that the civil rights movement may have had on elder Black voters. Arguably, the civil rights movement is a competitive process for political power, mirroring the process outlined in my conceptual framework, which may promote elder Black voters' political participation. The "Born Free" generation who does not navigate competition for political power may devalue their political rights, and thus less likely to participate than their grandparent's or parent's generation (Mattes 2012). My findings offer a potential explanation for the heterogeneity effects of the civil rights movement on the political participation of different generations of Black voters.

Immigration and Immigrants' Political Behavior

Another substantive topic that my theory and experimental findings can be applied to is the interpretation of immigrants' political behavior. Evidence shows that first-generation immigrants are more likely to participate in politics after earning their citizenship, compared to second-generation immigrants (Potochnick and Stegmaier 2020). My theory offers an explanation from the behavioral perspective about their difference in political behavior. That is, while both generations have political power (i.e. voting rights), a key difference between them is that first-generation immigrants earned their power through

[12]Additional results of all age groups are reported in Online Appendix J.



Note: The figures are plotted based on the data of Current Population Survey, Voting and Registration Supplements 1968 to Present, historical table A-1. Available: https://www.census.gov/data/tables/time series/demo/voting-and-registration/voting-historical-time-series.html.

Figure 5: Voting in Presidential Elections by Race and Age Group: 1964 to 1980

a competitive immigration process, while second-generation immigrants were born with political power. The quota limits on visas and green cards have made the immigration process extremely competitive. In addition, most first-generation immigrants encounter other challenges after entering the country, such as language barriers and inadequate social support. As such, the extensive immigration process may make first-generation immigrants value their earned political power more than those who did not have to earn their citizenship.

An important aspect of this study highlights that engaging in a competitive process for political power may trigger a strong desire to seek status through the use of political power. Indeed, observational studies have found that first-generation immigrants may use their earned power to actively support restrictive immigration regulations, likely for status considerations. For example, Krogstad and Lopez (2021) find that when compared with Latinos who are born in the U.S., Latino immigrants who are born in a foreign country and later naturalized are more likely to prioritize policies that "restrict illegal immigration," "increase security along the U.S.-Mexico border," and "prevent people from overstaying their visas." Just and Anderson (2015) use data from the European

Social Survey in 18 West European democracies and compare support for immigration. While foreigners support immigration more than natives, Just and Anderson find that immigrants who have just acquired citizenship in their host countries are more skeptical about the consequences of immigration and admitting new arrivals relative to noncitizen immigrants. Besides existing explanations, such as newcomers "catching up" with the locals, this phenomenon is likely driven by the newcomers' self-interest and their desire to maintain their status by excluding other immigrants. The scholarly understanding of how immigration affects immigrants' political behavior is limited. This work initiates new research questions from a novel perspective for future studies.

Empowering Women in the Political Processes

The arbitrary assignment of political status in the Control of Experiment I is analogous to divergent levels of political power between the sexes. Historically, men held more political power than women in most cultures. Being born a woman meant an individual had lower political status, therefore the assignment of their status at birth was as if it were randomized. However, the global rise of feminism and women's rights advocacy (mirrored in the competition for political power in the Treatment of Experiment I) expanded political rights, resulting in increased enfranchisement and representation.

Since the ratification of the Nineteenth Amendment in 1920, women's ability to exercise political influence has been an increasing function of their political participation. Based on the data reported in Cascio and Shenhav (2020), I find that during the 1940s and 1960s, women who were born between 1901 and 1916 are always more likely to turn out than women who were born between 1917 and 1932. A key difference between the two groups is that women who were born between 1901 and 1916 were not born with the right to vote. According to the theory of this study, one of the reasons that the earlier cohort participated more in elections is that they directly or indirectly engaged in the competition for voting power. In addition to the historical evidence, recent studies show that observing women's success in the competitive democratic process also motivates

participation. For example, women's participation as elected officials has increased other women's interests to join political competitions and use their power.[13] The opportunity to compete for political power likely increases how young women value jobs in politics. Based on U.S. data from 1976 to 2001, Campbell and Wolbrecht (2006) find that women politicians serve as role models for adolescents and motivate adolescent girls' to be politically active. Given women are always subject to competition for political power, it is critical to ensure that women are offered institutional protections to keep them from being forced out by more powerful groups. How to design policies to engage women in politics is beyond the scope of the present paper but an important area for future research.

Conclusion

In this study, I demonstrate that competition for political power promotes participation. I disentangle these effects from endogenous identity formation, identify that the process of competition for power mobilizes all players, regardless of whether they earned more power or not, and discover that the increased participation is not mainly driven by strategic responses to outgroup voting but a direct outcome of competition for political power. The conceptual framework of this study and the setup of experiments mirror the competitive nature of individuals and interest groups in pursuing power. While the effect of earning political power can be explored from a variety of perspectives, this paper should be seen as one of the few attempts to empirically explore how competition for political power affects political behavior significantly.

The general setup of this study enables me to explore research questions without concern for the application of a precise context and definition of institutional factors. Political power and the process of competition for political power established in a labo-

[13]As reflected through a policy experiment in India, women's leadership has a significant role model effect on young women's aspirations to choose male-dominated careers (Beaman et al. 2012).

ratory environment may differ in a number of ways from power developed in naturally occurring situations. Future studies should examine whether establishing political power and manipulating competition for power in other ways might elicit different behavioral effects than what was investigated in this study. While the probabilistic voting rule implemented in the experiments is an effective protocol to impose necessary controls, it is not impossible that this protocol may generate some unique results. Future studies should add to this work by examining the effects of competition for political power on participation across a set of different voting rules.

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Online Appendix: Race to the Top: How Competition for Political Power Affects Participation*

Kai Ou†

*Replication files are available in the JOP Data Archive on Dataverse (https://dataverse.harvard.edu/dataverse/jop). The empirical analysis has been successfully replicated by the JOP replication analyst. All errors remain the author's own responsibility.

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A Voting Games

I consider simple voting games to represent the collective public policy selection process. There are N voters who collectively choose one of two policies, $\{A, B\}$. The electorate is split into two groups of voters and there is asymmetry in political preferences and political power between the two groups. Group A has $\beta N = N_A$ voters and Group B has $(1-\beta)N = N_B$ voters, where $0 < \beta < 0.5$. All Group i players receive the same payoffs if Policy j is elected, so that $u_i^j > 0$. Moreover, Group i voters receive higher payoffs if Policy i is elected; that is, $u_i^i > u_i^j, i \neq j$. Group A is a *high-power group* in which each of its voters has more political power than each Group B voter. The political influence of a high-power voter, the weight in the voting, is given by k, where $k \geq 1$. Voting for a policy incurs individual i a voting cost c, while abstaining is free. The size of the electorate and the number of each type of voter is common knowledge to all.

All voters simultaneously and privately choose one of three options: *abstain*, *vote for* A, or *vote for* B. The group decision is determined by selecting one ballot at random. If the selected ballot voted for Policy A (B), then Policy A (B) is declared the winner; if the selected ballot is an abstention, then an additional ballot is drawn until a winner is determined. In the case that all voters abstain, then each policy wins with a probability of 50%.

The theoretical analysis follows the logic of a pivotal voter model in which a voter is motivated by her individual assessment of the likelihood that her vote will be pivotal in the ultimate decision. It is straightforward that any vote in favor of a policy increases the probability that such policy wins the election. Hence, in a simple rational agent voting model, for any distribution of voter choices, a Group i voter voting for Policy i dominates voting for Policy j. Thus, the only choice voters face is whether to vote for their own preferred policy or abstain. Define p as the probability that a Group A player votes for Policy A and q as the probability that a Group B player votes for B, then the probability that a Group A (or B) voter abstains is given by $1-p$ (or $1-q$).

Define $\Delta\pi_i$ as the increase in the probability of Policy i winning when a voter of Group i chooses to vote rather than abstain, then $\Delta\pi_i(u_i^i - u_i^j)$ is the expected benefit of voter i voting for Policy i. I focus on the symmetric strategy in which voters with the same information and tradeoff follow the same equilibrium strategy. The equilibrium strategy

profile of an individual voter is characterized by the mixed strategy, (p^*, q^*), given that the cost of voting and payoffs of each possible outcome is common knowledge. We refer to this strategy profile as $\sigma(p^*, q^*)$. We assume that voters make their voting decisions using the standard calculus of voting:

$$\begin{array}{ll} \text{If } \Delta\pi_i(u_i^i - u_i^j) > c & \text{vote for Policy } i \\ \text{If } \Delta\pi_i(u_i^i - u_i^j) = c & \text{randomize} \\ \text{If } \Delta\pi_i(u_i^i - u_i^j) < c & \text{abstain} \end{array}$$

There exists a symmetric mixed strategy profile of an individual voter, $\sigma(p^*, q^*)$, which solves

$$\Delta\pi_i(u_i^i - u_i^j) = c,$$

is a symmetric Bayesian Nash equilibrium to the voting game. The potential for strategic voting behavior implies that for the same group of players, the more likely are others to vote, the more incentives there are to free-ride and abstain. When the parameters of the payoff and voting cost are determined, the calculation of the equilibrium behavior should have the same prediction. Correspondingly, the probability of a policy winning the election is determined.

With some abuse of notation, m_A denotes the number of *other* group A voters voting for Policy A, $0 \leq m_A \leq N_A - 1$; and m_B denotes the number of *other* group B voters voting for Policy B, $0 \leq m_B \leq N_B - 1$. Given the winner of the election is determined by drawing a ballot at random, for an individual i from group A, by engaging in and voting for Policy A, i will increase the probability that A wins by $\frac{k(m_A+1)}{k(m_A+1)+m_B} - \frac{km_A}{km_A+m_B}$; similarly, for an individual j from group B, by engaging in and voting for Policy B, j will increase the probability that B wins by $\frac{m_B+1}{km_A+m_B+1} - \frac{m_B}{km_A+m_B}$. Thus, a group A voter's reaction function is:

$$\Delta\rho_A(N; p, q) = \underbrace{\left(\sum_{m_A=0}^{N_A-1} \binom{N_A-1}{m_A} p^{m_A}(1-p)^{N_A-1-m_A}\right)}_{\text{assessment of A's voting}} \times \underbrace{\left(\sum_{m_B=0}^{N_B} \binom{N_B}{m_B} q^{m_B}(1-q)^{N_B-m_B}\right)}_{\text{assessment of B's voting}} \times \underbrace{\left(\frac{k(m_A+1)}{k(m_A+1)+m_B} - \frac{km_A}{km_A+m_B}\right)}_{\text{increase of A winning}} \tag{1}$$

Similarly, a group B voter's reaction function is:

$$\Delta\rho_B(N;p,q) = \underbrace{\left(\sum_{m_A=0}^{N_A}\binom{N_A}{m_A}p^{m_A}(1-p)^{N_A-m_A}\right)}_{\text{assessment of A's voting}} \times \underbrace{\left(\sum_{m_B=0}^{N_B-1}\binom{N_B-1}{m_B}q^{m_B}(1-q)^{N_B-1-m_B}\right)}_{\text{assessment of B's voting}} \tag{2}$$

$$\times \underbrace{\left(\frac{m_B+1}{km_A+m_B+1}-\frac{m_B}{km_A+m_B}\right)}_{\text{increase of B winning}}$$

Hence, the expected benefit for a group A voter from voting is $\Delta\pi_A = \Delta\rho_A(u_A^A - u_A^B)$, and it is $\Delta\pi_B = \Delta\rho_B(u_B^B - u_B^A)$ for a group B voter. When the expected benefit is equal to the voting cost ($\Delta\pi_A = c$ and $\Delta\pi_B = c$), a voter is indifferent between voting (for one's group favored policy) and abstaining. When both a group A voter and a group B voter is indifferent, it yields the symmetric mixed strategy equilibrium (p^*, q^*).

When the parameters of the payoff and voting cost are determined, the calculation of the symmetric mixed-strategy equilibrium behavior as well as the probability of a policy winning the election is determined. By a symmetry assumption that voters of the same type with the same information will behave the same:

Remark 1 *The probability of Policy B winning the election can be simplified to*

$$\textit{Prob. (B wins)} = \frac{q^*N_B}{p^*kN_A + q^*N_B}.$$

Since Policy B is the majority preferred policy in this study, Remark 1 defines the *health of policy outcomes*, and it establishes the predictions for the probability that the majority preferred policy winning. This remark follows by noticing that once the proportion of size of different groups and the level of political advantage is fixed, the probability of Policy B winning depends on voters' turnout.

B Nash Equilibrium Predictions

Nash Equilibrium Voting without Intrinsic Value

I investigate a voting game in which there are 5 voters. There are 2 Group A voters and 3 Group B voters. To solve for the symmetric mixed strategy Bayesian Nash Equilibrium (BNE), I use the choice of parameter values used in the experiment and derive the reaction functions for each role of voters as functions of p and q. Specifically, Equation 1 in Section A presents the values of p and q such that a Group A voter is indifferent between voting and abstaining; Equation 2 below presents those values such that a Group B voter is indifferent between voting and abstaining. In Experiment I, $k = 2$. In Experiment II, $k = 1$. Based on the parameterizations of VG1 and VG2, I solved these two reaction functions simultaneously for VG1 and VG2, respectively. The calculations generate a unique symmetric mixed strategy equilibrium. Then, by the symmetry assumptions and Remark 1, it is straightforward to derive the equilibrium predictions of Policy B winning elections. The results are reported in Table 3 of the main text.

Based on these BNE predictions, we should expect that: (1) In both Experiment I and Experiment II, Group A voters should vote more frequently than Group B voters in VG1. (2) In both Experiment I and Experiment II, Group B voters should vote more frequently than Group A voters in VG2. (3) In both Experiment I and Experiment II, Policy B should be more likely to win in VG2 than in VG1. (4) In both Experiment I and Experiment II, individuals desire to become Group A voters because a Group A voter's expected payoff is higher than a Group B voter's expected payoff. (5) In VG1, both Group A and Group B voters should vote more frequently in Experiment II than in Experiment I. In VG2, the voting equilibrium is the same in Experiment II as in Experiment I.

Nash Equilibrium Voting with Intrinsic Value

In previous sections, I reported the benchmark voting model and Nash predictions without considering the intrinsic value from voting. However, social psychology studies have suggested that values correlate with political behavior and influence voting (e.g. Goren 2005; Jacoby 2006; Ansolabehere, Rodden and Snyder Jr 2008). To incorporate the behavioral effect of competition and accommodate for the influence of altered values, in this section I include the intrinsic value gained from voting into the analysis. Following

the literature, I assume that a voter's payoff is given by:

$$\pi_(\sigma) = \begin{cases} \pi_{vote}(\sigma) + \nu & \text{if voted} \\ \pi_{abstain}(\sigma) & \text{if abstained} \end{cases}$$

where π is the expected monetary payoff to a voter from voting, σ is the symmetric equilibrium strategy, and ν is an element which represents the psychological utility a voter receives from voting. This setup explicitly assumes that ν is independent of the payoffs received that are based on the outcome of the election, although voters' choices and turnout will be affected. ν is a function of intrinsic value of voting, which is assumed to be universal and symmetric to all social groups under a competitive environment. The more an individual values (devalues) his or her votes and political participation, the higher (lower) ν is.

In the discussion of the intrinsic value of voting, the treatment variable is the competitive environment that determines political power. The competitive environment shapes values as discussed in the main text and affects voting behavior. Since the influence of other factors that affect ν is randomized across institutions and thus controlled, the difference of ν should be the psychological consequence of a competitive environment that is caused by competition for political power. Thus, $\nu(t)$ has different values under different environment, where t is the variable represents the setting of the competitive environment. In this study, an environment is always exogenously implemented.

While it is assumed that ν is independent of the payoffs received that are based on the outcome of the election, it should be noted that voters' choices and turnout will be affected. When ν is arbitrarily large (small), we should expect that voters should always vote (abstain). Even in VG2 in which instrumentally minded Group A voters should not vote, when ν is sufficiently large and outweigh the cost of voting, the weak-dominant strategy for instrumentally minded Group A voters who have status-seeking preference should be voting for Policy A. To illustrate the relationship between ν and the symmetric mixed strategy equilibrium (p^*, q^*), I parameterize ν as a continuous value in an arbitrary range and solve for the equilibrium (p^*, q^*) at each value point. The results are reported in Figure B1, which illustrates a monotonic relationship between the intrinsic value ν from voting and the equilibrium voting behavior (p^*, q^*). These results suggest that individuals are more likely to vote as they assign more intrinsic value to voting.

As discussed in the main text, I hypothesize that competition for political power is

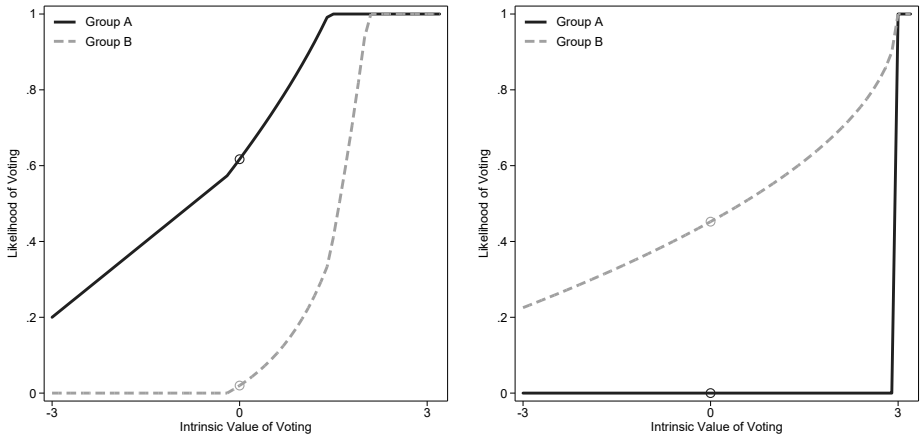


Figure B1: Nash Equilibrium of Voting by ν and election

likely to increase people's interest in politics and engagement in politics, and lead them to value political participation. The results reported in Figure B1 demonstrate that voters' participation increases with the intrinsic value from voting.

Furthermore, the changes of voting should translate into the *health of democracy*, which is defined as the probability that the majority preferred policy is chosen by democratic decision-making. Policy B is the majority preferred policy. The dynamics of Group A and Group B voters' interactions should be shaped by how they compete for political power, which affects the probability of Policy B winning the elections. When I do not consider the value from voting, the Nash equilibrium predicts that Policy B should win about 2% of the time in VG1 and 100% of the time in VG2. See Table 3. Now I incorporate the value from voting into the analysis. Following the results reported in Figure B1, I derive the relationship between Policy B winning and the value of ν and report these results in Figure B2.

Figure B2 illustrates several unique and important features of the influence of competition for political power on the health of democracy. First, in VG1, the probability of Policy B winning increases as ν increases. This is because when voters assign more value to voting, both Group A voters and Group B voters are more likely to vote. Group B voters are the majority of the population. When they turn out more and vote for Policy B more frequently, Policy B is more likely to win. As VG1 represents the most common scenario in democratic decisions, namely the distribution of resources and wealth among social groups, this result implies that competition for political power may have positive

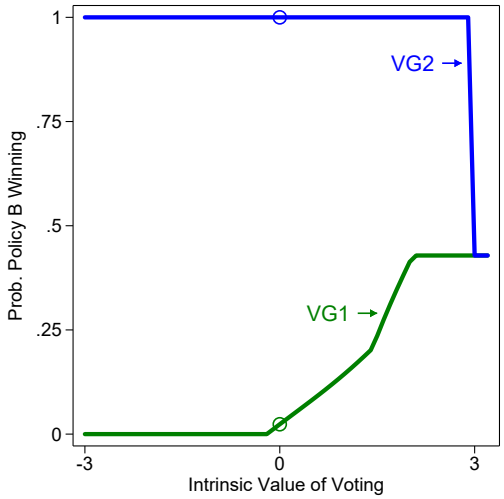


Figure B2: Probability of Policy B Winning by ν

influence on the health of democracy. That is, when competition motivates individuals to participate more in the democratic process, the majority preferred policy is more likely to become the winner of the election as the majority voters vote more frequently.

Second, in VG2, when ν is sufficiently large, the probability of Policy B winning decreases from 100% to about 43%. Recall that instrumentally minded Group A voters should not vote when ν is mild. This is because voting is costly but A's voting does not change their payoffs in VG2: Whether a Group A voter votes for a policy or abstain, his or her payoff is 25. Hence, when ν is arbitrarily small, Policy B wins 100% of the time because all Group A voters abstain. However, when ν outweigh the voting cost, then the weakly dominant strategy of instrumentally minded Group A voters who have status-seeking preferences is voting for Policy A. When all Group A and Group B voters vote for their preferred policy, the probability of Policy B winning is about 43%.

It should be noted that when all voters vote, the probability of Policy B winning is mechanically determined by the parameterizations of the experiments. The ratio between Group A and Group B voters, and how many ballots each voter has will determine the calculations. Since in this study I focus on the treatment effects of earning political power on voting behavior, I leave the discussion of how those variables affect the results to future studies.

C Quantal Response Equilibrium

The Nash equilibrium analysis assumes that the decision makers are fully rational, maximize the payoffs they are assigned, and make no errors. These assumptions do not seem to (always) hold in experiments with human subjects. An alternative evaluation of how competition for political status affects intrinsic value and political participation is to examine voting through a quantal response equilibrium (QRE, McKelvey and Palfrey 1995; Goeree and Holt 2005) analysis. A QRE analysis is a statistical version of Nash equilibrium in which all possible actions have a positive probability ordered by the expected payoffs of the actions. Given voters rarely vote for the policy that disadvantages the payoff of their own group, I consider QRE in which *voters choose either to vote for their group favored policy or to abstain.*

Notice that even if I am not primarily interested in noise effects *per se*, and the focus of this paper is not a test of point-predictions, it is necessary to add an error specification in order to numerically estimate parameters that are unobserved or are not directly induced in an experiment. The QRE approach is appropriate for such estimations, since random elements are fully integrated in an equilibrium framework, and since it includes the Nash equilibrium as a limiting case as the error rate goes to zero. Following McKelvey and Palfrey (1995) and Goeree and Holt (2005), I assume that voters' perception of their payoffs are subject to random disturbances which are related to earning political power. Define σ as a mixed strategy profile for voters in the game, $\pi_{vote}(\sigma)$ as the expected payoff to a voter of group i from voting for a policy i given the other players follow σ_{-i}, and $\pi_{abstain}(\sigma)$ as the expected payoff to a voter of group i from abstaining given the other players follow σ_{-i}. Assume that there are two additional privately observed payoff disturbances, ε_i^{vote} and $\varepsilon_i^{abstain}$ such that a voter's payoff is given by:

$$\pi_i(\sigma) = \begin{cases} \pi_i^{vote}(\sigma) + \nu + \mu_i \varepsilon_i^{vote} & \text{if voted} \\ \pi_i^{abstain}(\sigma) + \mu_i \varepsilon_i^{abstain} & \text{if abstained} \end{cases}$$

where ν is a parameter which represents the intrinsic utility a voter receives from voting and the error rate μ_i is a strictly positive real number. For each voter, the payoff disturbances are assumed to have a joint distribution which can be represented by a density function with marginal densities that exist for each disturbance. The disturbances are assumed to be independent across voters and have a zero mean. It is assumed that ν

is independent of the choices of other voters and thus is not a function of σ. It is also assumed that ν is independent of the payoffs received that are based on the outcome of the election, although voters' choices and turnout will be affected.

In the quantal response equilibrium, voters are assumed to choose strategies to maximize their disturbed payoffs given others' choices as in a Nash equilibrium. To provide parametric estimates in the analysis, I use the logit specification of QRE, where the quantal response functions follow logit distributions with a response parameter $\lambda = \frac{1}{\mu_i}$ that represents how sophisticated the players are. When $\lambda = 0$, all strategies are used with equal probability. When $\lambda > 0$ and is arbitrarily large, the quantal response is consistent with the Nash equilibrium best response. To determine how intrinsic values affect voting and identify treatment effects, I estimate λ and ν simultaneously using the following functional form for each treatments:

$$\sigma_i^{vote} = \frac{exp\{(\pi_i^{vote}(\sigma) + \nu)\lambda\}}{exp\{(\pi_i^{vote}(\sigma) + \nu)\lambda\} + exp\{\pi_i^{abstain}(\sigma)\lambda\}}.$$

Because the intrinsic value of voting is unobserved, the probability that an individual choose to vote is the expectation of the probability intergraded over the observed distribution of the level of the intrinsic value of voting under different treatments. Let y_{ij} be an indicator function equal to one if subject i chooses the action vote. The log-likelihood function for treatment t can be written as:

$$LL_t = \sum_{i \in I_t} \sum_{j \in J_t} y_{ij} \ln Prob(vote|\nu)$$

The log-likelihoods can then be summed across treatments. I start the analysis by using a single response parameter λ in the decision-making model. Since I do not expect that λ changes across voting games within a treatment group, the data of VG1 and VG2 of each treatment is pooled to estimate the log-likelihood. In VG1, λ is significantly different between the Control and Treatment at 10% level. In VG2, λ is significantly different between the Control and Treatment at 5% level. Besides the significant difference of λ across treatments in VG1 and VG2, it should be noted that there is a salient difference between the experimental observations and the estimated voting probability. To reduce the likelihood of over-fitting the estimates, I pool the data from the Control and Treatment conditions for all elections and periods studied. Based on maximum like-

lihood estimations, I find that $\lambda = 0.239$ maximizes the objective log likelihood function in QRE. As illustrated in Figure C1, the difference between the QRE estimations and the experimental observations are even larger than the difference between BNE estimations and the experimental observations. These results suggest that a stochastic noise parameter (or a response parameter) does not explain the experimental results.

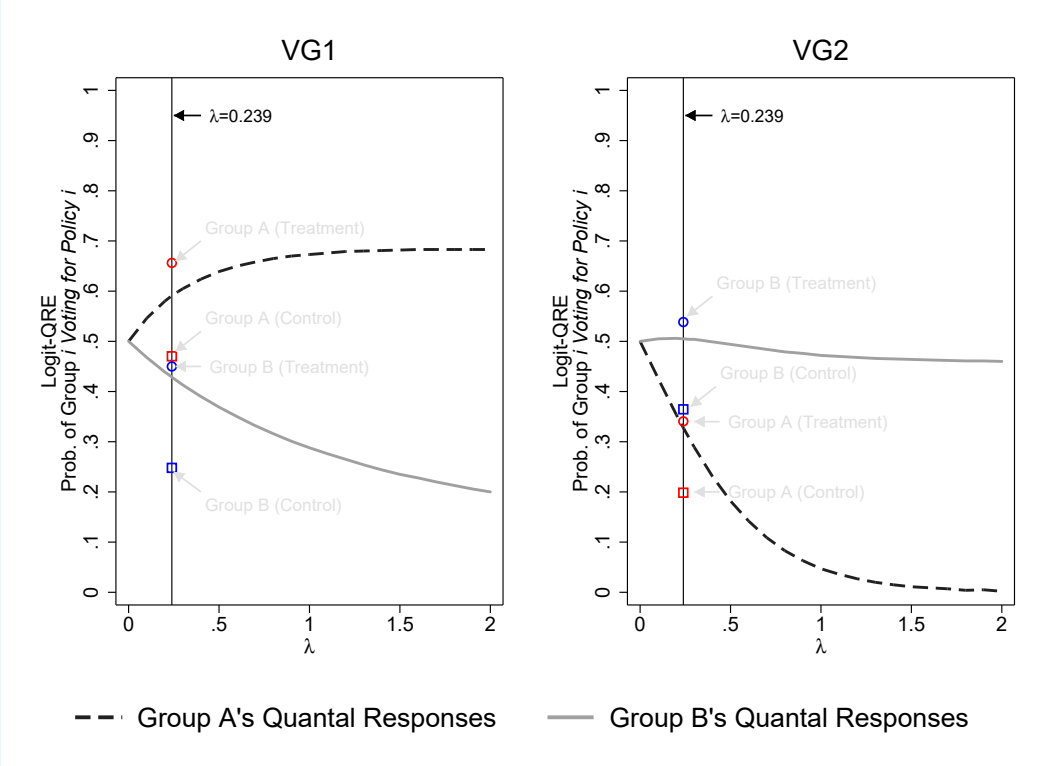


Figure C1: QRE Estimations without Intrinsic Value

Since the experimental observations are different from Nash equilibrium predictions, one may attribute the treatment effect reported in Experiment I to errors or "mistakes." Using a quantal response equilibrium analysis (McKelvey and Palfrey 1995 and Goeree and Holt 2005), I explore how adding a noise response parameter that reflects the error rate into the equilibrium analysis can explain the experimental results. I find that even if we consider the symmetric noise and potential "mistakes" that subjects may make in voting, the quantal response equilibrium predictions still depart from experimental observations, which suggests that stochastic noise effects cannot explain my findings.

I am interested in the behavioral effect of earning power on the intrinsic value of voting. Therefore, I include intrinsic value (represented by ν) into the decision-making model and investigate the effects of competition for political power on the intrinsic value of voting.

The log likelihood of the objective function can be significantly improved by considering the effect of intrinsic value influenced by the competitive environments. Considering the influence of intrinsic value in the QRE analysis, the equilibrium predictions are close to experimental results, which is illustrated in Figure C2.

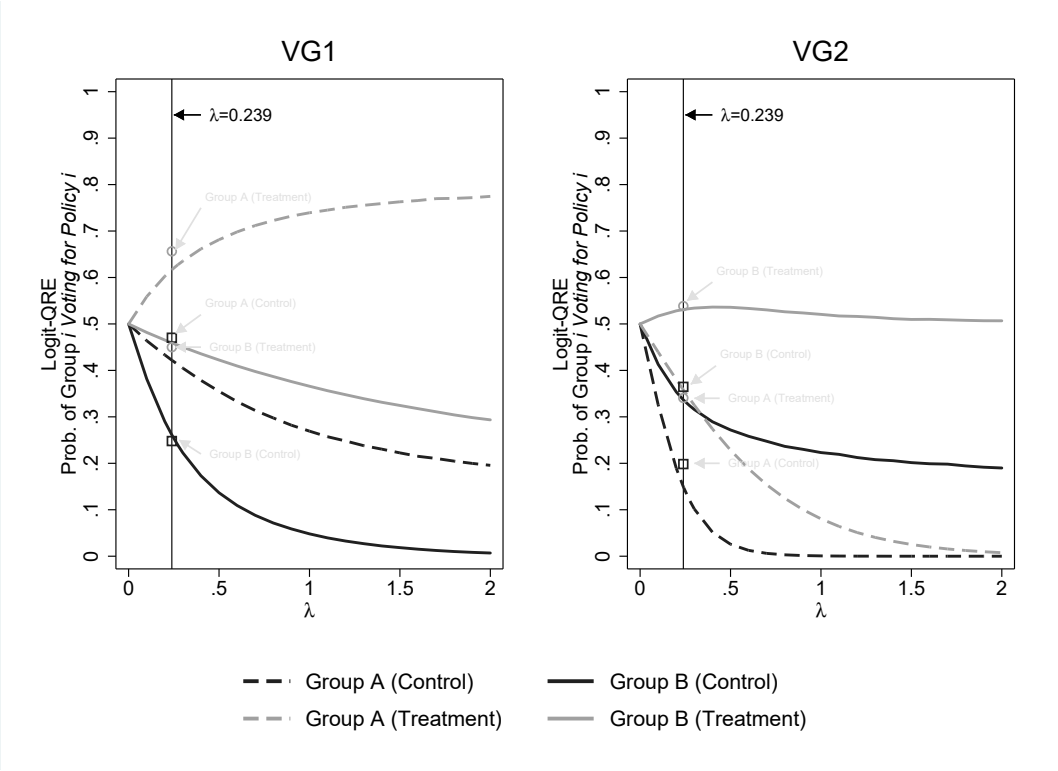


Figure C2: Equilibrium Voting with Intrinsic Value (constrained at $\lambda = 0.239$)

D Other-Party Voting

In the experiments, a small minority of subjects voted for the other group's favored policy (hereafter, other-party voting). Specifically, in VG1, Group A voters engaged in other-party voting less than 2% of the time in the Control and about 1% of the time in the Treatment, and Group B voters engaged in other-party voting 2% of the time in the Control and 2% of the time in the Treatment. In VG2, Group A voters engaged in other-party voting about 6% of the time in the Control and 2% of the time in the Treatment, and Group B voters engaged in other-party voting 2% of the time in the Control and 1% of the time in the Treatment. A tentative explanation of the other-party voting observed in VG1 could be cognitive mistakes. Most of the observed other-party voting occurred in the first five election periods of a session. There is no statistically significant difference of proportions of other-party voting in VG1 between treatments, and it is true for both Group A and Group B voters. This suggests that any stochastic or systematic human errors applied to this study are identical across treatments and experiments. Hence, the observed treatment effects do not interfere with unobserved confounders.

However, in VG2, the results of other-party voting are more nuanced. Specifically, Group A voters chose Policy B about 6% of the time in the Control but only 2% of the time in the Treatment, Group B voters chose Policy A about 2% of the time in the Control and 1% of the time in the Treatment. Group B voters' other-party voting is not statistically different across treatments, which may be errors as noted above. However, Group A voters' other-party voting in VG2 may not be interpreted simply as mistakes. Group A voters are significantly more likely to engage in other-party voting in VG2 than in VG1, and Group A voters' other-party voting in VG2 is significantly different from the behavioral patterns of Group B voters. Moreover, while most other-party voting happened in the first 5 election periods, Group A voters' other-party voting also happened in the latter election periods in VG2, which makes their behavioral pattern noteworthy. Then, how should we interpret Group A voters' other-party voting in VG2?

Looking at the results of other-party voting, it is straightforward to note that only when the other-party voting is moral and prosocial, the proportion of other-party voting is statistically different from zero. This implies that Group A voters' voting for Policy B in VG2 may reflect their *moral bias – supporting the policy or candidate understood by voters*

to be morally superior (Feddersen, Gailmard and Sandroni 2009). We cannot completely exclude the possibility that some Group A voters voted for Policy B by mistake. However, given the consistency of the observed other-party voting behavior across treatments and experiments, it is reasonable to believe that Group A voters' other-party voting is driven by other-regarding preferences — their desire to express their support of the moral and socially desirable policy. If this is the case, then the results in Experiment I suggest that competition for political power makes individuals less likely to be other-regarding but more likely to be self-regarding in voting. Specifically, in Experiment I and VG2, Group A voters' were significantly more likely to vote for Policy B in the Control than in the Treatment (6% vs 2%, Mann-Whitney, electorate avgs, N=32, $p = 0.043$). This finding provides further evidence supporting the explanations of how competition for political power affects individuals' participation. This is consistent with the main results reported in the manuscript. Since our research is not designed to identify under what situations Group A voters are more likely to vote for Policy B in VG2, the exact mechanism of how competition affects moral and prosocial voting is out of the scope of this paper. Future studies should explore how other-regarding voting may be promoted in elections and develop policies and mechanisms to incentivize voters to vote more in favor of the public good to improve the health of democracy.

E Additional Empirical Results: Experiment I

This section provides further details of the data analysis reported and discussed in the result section (of Exp. I) of the main text. The section is organized to match the order of the results section (of Exp. I) of the paper.

First, in Table E1, I report the results of the regression-based analysis used to identify treatment effects on the likelihood of voting. These results are qualitatively identical to the results derived from examining the electorate averages with the non-parametric tests reported in the main text and summarized in Figure 2 of the manuscript.

Table E1: Treatment Effects on the Likelihood of Voting

	Dependent variable: Voted or not			
	VG 1		VG 2	
	Group A	Group B	Group A	Group B
Treatment = 1	0.191***	0.208***	0.220***	0.192***
	(0.060)	(0.059)	(0.061)	(0.070)
# Observations	1280	1920	1280	1920
# Electorates	32	32	32	32
Log-likelihood	-857.8	-1176.8	-645.8	-1283.5

Note: Logit specification. *Treatment* is a binary indicator to represent whether individuals participated in the Treatment. All reported results are average marginal effects of logit regressions. No control variables are included in the regressions. Standard errors are clustered at the electorate level and reported in parentheses. Significance levels: $* : < 0.10$ $** : < 0.05$ $*** : < 0.01$.

Second, in Table E2, I report the results of the regression-based analysis used to identify treatment effects on political values and the likelihood of Policy B winning in elections. Again, these results are qualitatively identical to the results derived from examining the electorates averages with the non-parametric tests reported in the main text and summarized in Figures 3, 4, and 5 of the manuscript. That is, competition for voting power significantly increases the importance that individuals place on voting, and it also significantly increases individuals' desire to out-earn the others. In VG1, competition for voting power significantly increases the likelihood that Policy B winning, but in VG2, competition for voting power significantly decreases the likelihood of Policy B winning. All statistical tests are two-sided even though our hypotheses predict treatment effects in specific directions.

Table E2: Effects of Treatment on Political Values and Policy B Winning

	Group A		Group B		VG1	VG2
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment = 1	1.250***	1.344***	1.417***	1.292***	0.092*	-0.134*
	(0.343)	(0.413)	(0.450)	(0.420)	(0.051)	(0.075)
Constant	4.719***	5.688***	4.750***	5.104***	0.283***	0.730***
	(0.239)	(0.289)	(0.362)	(0.331)	(0.041)	(0.064)
# Observations	64	64	96	96	640	640
# Electorates	32	32	32	32	32	32
R-squared	0.123	0.127	0.110	0.084	0.027	0.038

Note: OLS specification. *Treatment* is a binary indicator to represent whether individuals participated in the Treatment. In Columns (1) and (3), the dependent variable is how important it is for voters to participate in voting, which is elicited in post-treatment survey. In Columns (2) and (4), the dependent variable is how important it is for individuals to earn more than the others in the experiment, which is also elicited in post-treatment survey. In Columns (5) and (6), the dependent variable is the likelihood of Policy B winning in an election-period.
No control variables are included in the regressions.
Standard errors are clustered at the electorate level and reported in parentheses.
Significance levels: $* : < 0.10$ $** : < 0.05$ $*** : < 0.01$.

Third, I examine whether the data demonstrate learning effects within sessions. If learning occurs within a session we expect that voting behavior, with respect to A's and B's voting decisions, would change over time and that the policy outcome may change as a session progresses. I conduct logit regression for each treatment. The dependent variable is whether or not a participant vote. The independent variable is election-period. The regression is clustered at the electorate level. I do not find any evidence that participants are significantly more or less likely to vote in any treatment. Next, we investigate how the estimate of Policy B winning the election changes over time in Experiment I. The results of these tests are summarized in Table E3.[1] I find that the election period has negative effects on Policy B winning in the Control but positive effects in the Treatment. However, none of these effects are statistically significant at any conventional level of significance. I then test whether the coefficients are significantly different by treatment. I find the coefficient of each treatment is statistically indistinguishable by treatment.

[1]There are alternative measures as well, such as (1) whether an individual's voting decision changes as one experienced more elections, or (2) whether the group level voting decisions are correlated with the election-period. These alternative measures lead to similar conclusions.

Table E3: Prob. of Policy B Winning as a Function of Election-Period in Experiment I

Treatment	Coefficient	Robust Std. Error	t	$Pr > \|t\|$
Pooled	-0.001	0.003	-0.50	0.624
Control	-0.004	0.005	-0.89	0.387
Treatment	0.001	0.003	0.49	0.631

Note: OLS specification. The dependent variable is the estimated probability of Policy B winning. I focus on the average learning in the analysis and we separate the investigations by treatment, since we switch the sequence of VG1 and VG2 across sessions. The independent variable is election-period in the experiment.
In the pooled regression, 1280 observations are clustered at 64 clusters. In the regressions of Control and Treatment, 640 observations are clustered at 32 clusters, respectively.

Then, in Table E4, I report a complete table of regressions results reported in Table 3 in the main text. As stated in the main text, although the control variables such as gender and task performance significantly affect voting behavior, the main treatment effects are consistent and robust across Models 1-6.

Table E4: Effect of Treatment Variables on Voting Decisions

	Group A's Voting			Group B's Voting		
	(1)	(2)	(3)	(4)	(5)	(6)
Competition = 1	0.132**		0.227**	0.221***		0.205***
	(0.056)		(0.101)	(0.056)		(0.059)
VG1= 1		0.362***	0.442***		-0.114***	-0.141***
		(0.037)	(0.073)		(0.026)	(0.036)
Competition× *VG1*			-0.133			0.040
			(0.087)			(0.053)
TaskPerformance	0.016**	0.025***	0.017**	0.015**	0.014**	0.015**
	(0.007)	(0.006)	(0.008)	(0.006)	(0.006)	(0.006)
ElectionPeriod	-0.000	-0.000	-0.000	-0.003*	-0.002**	-0.003**
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Age	-0.003	-0.007	-0.003	-0.003	-0.006	-0.003
	(0.012)	(0.012)	(0.013)	(0.008)	(0.010)	(0.008)
Men= 1	0.152***	0.148**	0.168***	0.078*	0.091*	0.079*
	(0.053)	(0.058)	(0.060)	(0.046)	(0.052)	(0.047)
CRTScore	-0.052	-0.086	-0.055	-0.005	-0.036	-0.004
	(0.066)	(0.078)	(0.073)	(0.064)	(0.083)	(0.064)
Competitiveness	-0.011	-0.004	-0.011	-0.016	-0.021**	-0.016
	(0.011)	(0.012)	(0.012)	(0.010)	(0.010)	(0.010)
SocialScienceMajor	0.011	0.030	0.010	0.141**	0.089	0.142**
	(0.091)	(0.112)	(0.102)	(0.071)	(0.075)	(0.072)
BusinessMajor	-0.009	0.042	-0.010	-0.013	0.022	-0.014
	(0.069)	(0.077)	(0.077)	(0.071)	(0.095)	(0.073)
ArtHumanityMajor	-0.068	-0.086	-0.076	0.050	0.037	0.048
	(0.082)	(0.102)	(0.092)	(0.092)	(0.093)	(0.093)
OtherMajors	-0.081	-0.065	-0.091	0.069	0.049	0.069
	(0.059)	(0.070)	(0.067)	(0.068)	(0.072)	(0.068)
# Observations	2560	2560	2560	3840	3840	3840
# Electorates	32	32	32	32	32	32
Log-likelihood	-1579.4	-1437.6	-1418.1	-2406.8	-2467.0	-2379.5

Note: Logit specification. For Group A (B) voters, the dependent variable is whether one voted for Policy A (B). *Competition* is a binary indicator to represent whether individuals participated in the Treatment. *VG1* is a binary indicator that represents whether the nature of elections is VG1. All reported results are average marginal effects of logit regressions.

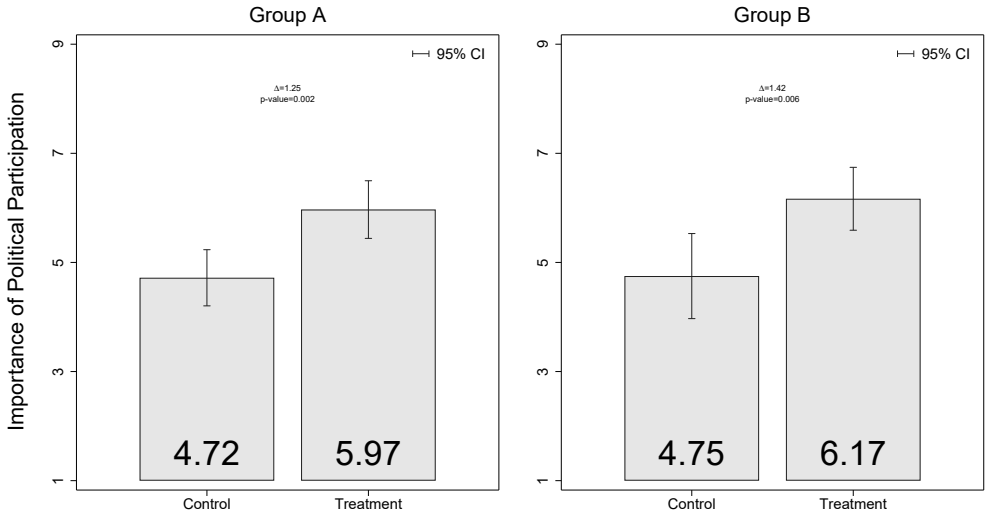
CRTScore is used to measure cognitive ability. We follow Frederick (2005). Subjects were asked to respond to the following three unincentivized questions with no time limit: (1) A bat and a ball cost $1.10 in total. The bat costs a dollar more than the ball. How much does the ball cost? (in cents). (2) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? (3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Competitiveness is self-reported and elicited in the post-treatment survey. Participants were asked: Do you consider yourself a competitive person? (on a scale of 1-9. 1 being Extremely competitive and 9 being Not competitive at all).

Standard errors are clustered at the electorate level and reported in parentheses.

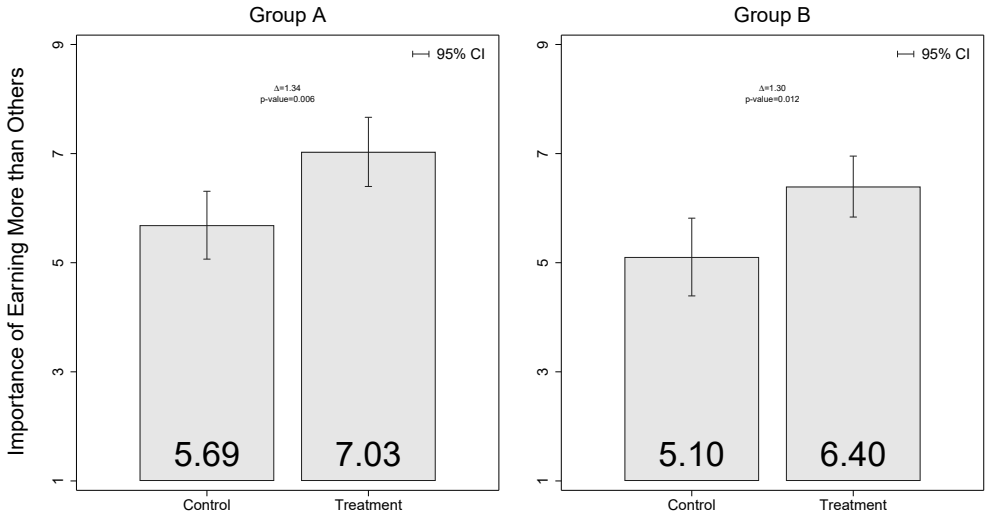
Significance levels: $* : < 0.10$ $** : < 0.05$ $*** : < 0.01$.

Finally, in Figures E1 and E2 I report the results of self-reported beliefs elicited in post-treatment survey.



Note: The numbers at the bottom are the average self-reported valuation of the importance of participation. The label below each set of bars shows the treatment that participants were randomly assigned to. The two left (right) sets of bars reflect elicited values of Group A (B) voters. The importance of participation was elicited after participants finished the Voting Stage and measured by the answer to the question: How important is it for you to vote for a policy? This question was measured based on a scale of 1-9, 1 being not important at all, 5 being neutral, and 9 being extremely important. The reported p-value is the result of the Mann-Whitney Wilcoxon test on electorate averages. Online Appendix E contains the results of the regression-based analysis with 160 individual observations.

Figure E1: Valuation of Participation by Voter and Treatment



Note: The numbers at the bottom are the average self-reported preference for economic status. The label below each set of bars shows the treatment that participants were randomly assigned to. The two left (right) sets of bars reflect elicited values of Group A (B) voters. Preference for economic status was also elicited in the post-treatment survey. Participants were asked: How important is it that you earn more than the others in this experiment? This question was measured based on a scale of 1-9, 1 being not important at all, 5 being neutral, and 9 being extremely important. The reported p-value is the result of the Mann-Whitney Wilcoxon test on electorate averages. Online Appendix E contains the results of the regression-based analysis with 160 individual observations.

Figure E2: Valuation of Earning More than the Others by Voter and Treatment

F Additional Empirical Results: Experiment II

I find that in Experiment II, there is no significant difference in voting between the Control and Treatment conditions. Group A voters, in VG1, voted about 43% of the time in the Control and 44% in the Treatment, and in VG2, voted about 9% of the time in the Control and 12% in the Treatment. Group B voters, in VG1 (VG2), voted about 44% (39%) of the time in the Control and 41% (39%) in the Treatment condition. None of these pairwise comparisons are statistically different. Voting is influenced by political values. Looking at the self-reported values regarding how important it is for an individual to vote, Group A's average is 5.09 in the Control and 4.91 in the Treatment. Group B's average is 5.08 in the Control and 5.19 in the Treatment. Regarding how important it is for an individual to earn more than the others, Group A's average is 5.44 in the Control and 5.19 in the Treatment. Group B's average is 5.48 in the Control and 5.29 in the Treatment. I find little difference in the self-reported values between the Control and Treatment. Compared to the positive treatment effects on political values identified in Experiment I, I find no evidence that the common trait caused by competition promotes political values or participation in Experiment II.

Examining policy outcomes, in Experiment II, I find little difference in the likelihood of Policy B winning between the Control and Treatment. In VG1, Policy B is estimated to win about 59% of the time in the Control and 55% of the time in the Treatment. In VG2, Policy B is likely to win about 79% of the time in the Control and 79% of the time in the Treatment. None of these pairwise comparisons are significant at any conventional level of significance. The zero treatment effects on the likelihood of Policy B winning is not surprising because, in Experiment II, Group A voters did not vote more frequently in the Treatment than in the Control condition.

As discussed in the main text, because there are always two groups of voters, there may be identity voting in both the Control and Treatment conditions. The difference between the Control of Experiment II (E2-Control) and the Treatment of Experiment II (E2-Treatment) is that group identity is endogenously formed in E2-Treatment but exogenously assigned in E2-Control. I do not find any evidence that the endogenous formation of group identity in E2-Treatment affects voting differently than how the exogenously developed group identity affects voting in E2-Control. Given the settings of Experiment

II are identical to the settings of Experiment I except that individuals do not compete for political power in Experiment II, if identity voting or endogenous formation of group identity are the driving mechanism behind the results of Experiment I, we should observe the same results in Experiment II, which is not the case. Thus, I conclude that the results in Experiment I are not driven by identity voting and/or the endogenous formation of group identity.

The results of Experiment II also enable us to investigate how a compositional difference and selection effect affect voting in Experiment I. It is critical to highlight that, neither the compositional difference nor selection effect can explain the higher participation of both Group A and Group B voters in the Treatment. By examining participants' characteristics such as age, distribution of academic majors, gender, cognitive reflection score, self-reported competitiveness, and GPA, I do not find any difference between subjects in Experiment I and subjects in Experiment II. Moreover, Group A and Group B voters in the Treatment solved about the same amount of questions correctly in Experiment I as in Experiment II. We have known that participants who solved more problems in the Task Stage are significantly more likely to vote. Given this, if a compositional difference (that generates a selection effect) causes the results in Experiment I, we should observe the same findings in Experiment II. But I did not observe these effects in Experiment II.

In Table F1, I focus on the voting results in VG2 and compare them between Experiment I and Experiment II, which double-checks the results summarized in Figure 6 of the manuscript. These results suggest that in the Control, there is no statistical difference of voting between Experiment I and Experiment II, but in the Treatment, voters are significantly more likely to vote in Experiment I than in Experiment II. These results are consistent with the findings reported in the main text, and suggest that *controlling for compositional difference and selection effect*, competition for political power significantly increases voting in ways that cannot be explained by identity voting. Notice that the only difference between the Treatment in Experiment II (E2-Treatment) and the Treatment in Experiment I (E1-Treatment) is that voters do not compete for political power in E2-Treatment but they do so in E1-Treatment. Then, these results highlight the unique influence caused by competition for political power. While there may be latent behavioral factors that could be associated with a selection effect and/or identity voting, there is

no evidence that any effects highlighted in this study other than competition for voting power could explain the reported findings.

Table F1: Treatment Effects on the Likelihood of Voting by Experiment

	Dependent variable: Voted or not			
	Control		Treatment	
	Group A	Group B	Group A	Group B
Experiment $I = 1$	0.027	-0.044	0.217***	0.149**
	(0.051)	(0.068)	(0.062)	(0.071)
# Observations	1280	1920	1280	1920
# Electorates	32	32	32	32
Log-likelihood	-434.4	-1264.1	-649.7	-1304.8

Note: Logit specification. *Experiment I* is a binary indicator to represent whether individuals participated in Experiment I or Experiment II. All reported results are average marginal effects of logit regressions. No control variables are included in the regressions. Standard errors are clustered at the electorate level and reported in parentheses. Significance levels: $* : < 0.10$ $** : < 0.05$ $*** : < 0.01$.

G Isolating Effects of Observing Out-group Voting

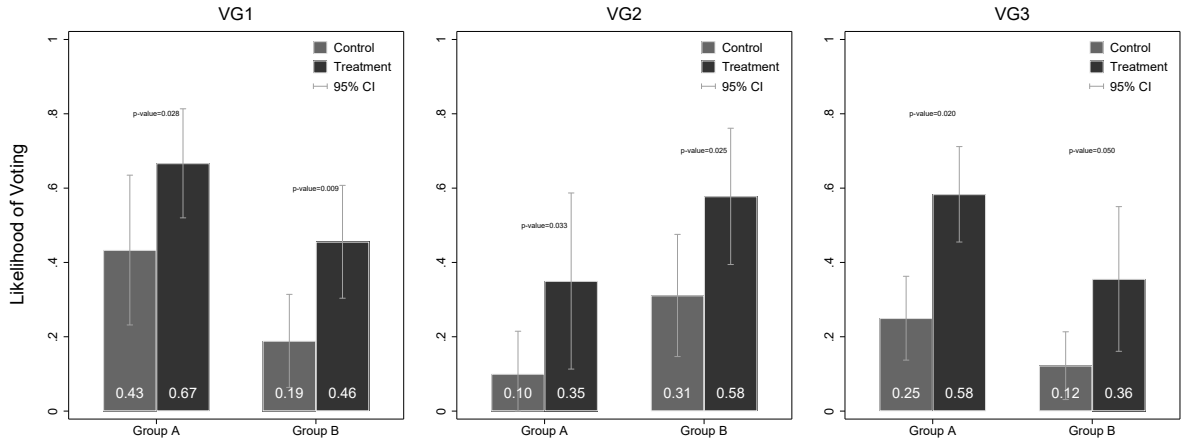
To isolate the strategic effects that may be caused by observing out-group voting, in Experiment III, I first let participants engage in voting for 15 periods and provided *no* feedback between periods. Participants played the voting games of Experiment I (i.e. VG1 and VG2) and a new voting game VG3, as shown in Table G1. In VG3, each Group B voter receives 25 regardless of whether Policy A or B wins but each Group A voter receives 25 when Policy A wins and 5 when Policy B wins. Each of these three voting games was played for five periods. We randomized the sequence of these voting games across electorates to avoid order effects. Participants knew that election results were determined by Group A's and Group B's voting from the same session.

Table G1: Payoffs of Elections in Experiment III

	Winner of VG1		Winner of VG2		Winner of VG3	
	Policy A	Policy B	Policy A	Policy B	Policy A	Policy B
Each Group A Voter	25	10	25	25	25	5
Each Group B Voter	10	20	5	25	25	25
Minimum Payoffs	10	10	5	25	25	5
Aggregate Payoffs	80	80	65	125	125	85

In Experiment III, as in Experiment I, I find that participants were significantly more likely to vote in the Treatment than in the Control. The significant effects on aggregate voting can be seen in Figure G1. When there is no feedback, in VG1, Group A voted about 43% of the time in the Control and 67% of the time in the Treatment; Group B voted about 19% of the time in the Control and 46% of the time in the Treatment. In VG2, Group A voted 10% of the time in the Control and 35% of the time in the Treatment; Group B voted about 31% of the time in the Control and 58% of the time in the Treatment. In VG3, as expected, Group A voted 25% of the time in the Control and 58% of the time in the Treatment; Group B voted about 12% of the time in the Control and 36% of the time in the Treatment. I cluster the statistical analysis at the individual voter level and perform a Wilcoxon Mann-Whitney test to identify the difference between treatments. The difference of each pairwise comparison is statistically significant at the five percent level. The results are qualitatively the same when we use a t-test. These results suggest that competition for voting power significantly increases voting for both Group A and Group B voters, in the absence of observing out-group voting. Combing these results with the results of Experiment I, the significant and robust treatment effects

of competition for voting power are not driven by strategically responding to out-group voting.



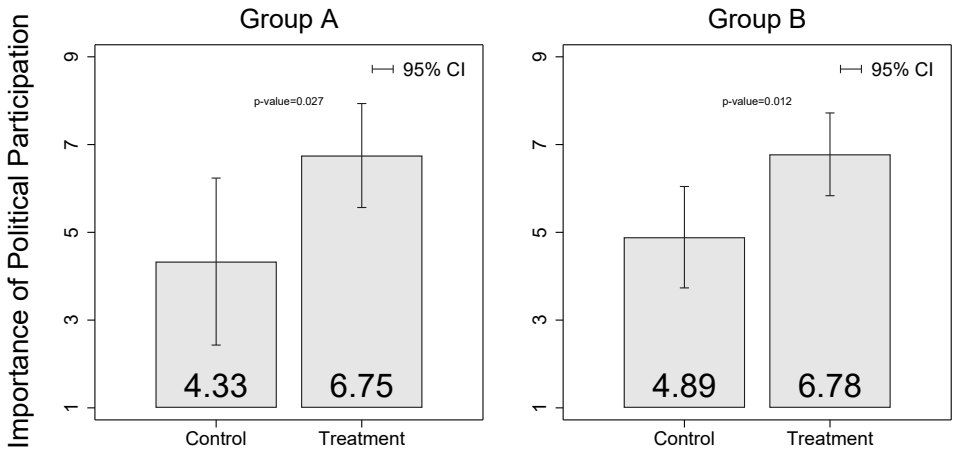
Note: The numbers at the bottom of the bars are the average voting rates of the voters under that bar. The label below each set of the bar shows voter groups. The two left (middle, right) sets of bars reflect average voting in VG1 (VG2,VG3). In the first 15 periods, individuals received no feedback. Thus, their behavior cannot be affected by the choices of other participants, or the voting outcomes of previous election rounds. I cluster the analysis at the individual voter level. There are 12 Group A voters in the Control and 12 in the Treatment. There are 18 Group B voters in the Control and 18 in the Treatment. The reported p-value is the result of the Mann-Whitney Wilcoxon test on individual averages.

Figure G1: Likelihood of Voting by Election and Treatment in Exp. III (Period$\leq$15)

H Isolating Effects of Feedback on Values

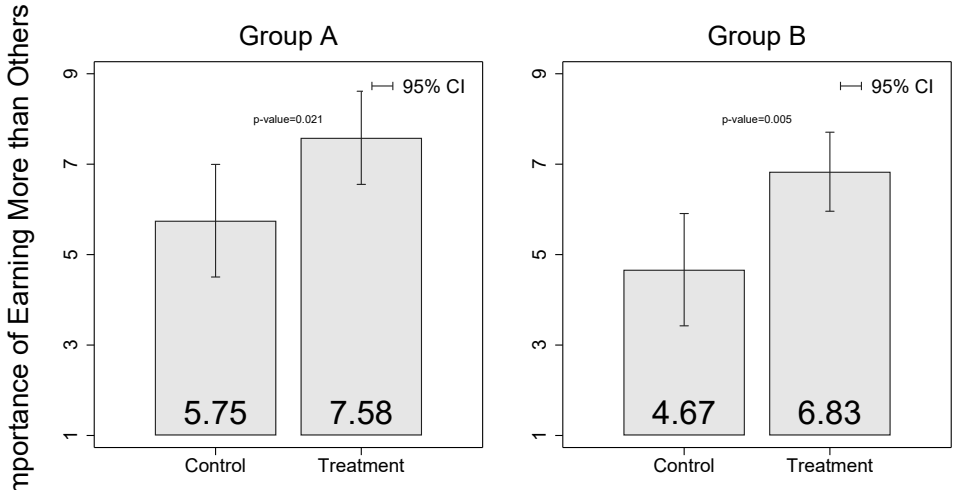
The altered voting behavior in competition for political power suggests changes in political values, which should be reflected in self-reported beliefs elicited in post-treatment survey. A potential question is that Group A and/or Group B voters may report higher values in the Treatment than in the Control in Experiment I because of their observations or experience in the experiment. That is, because participants received feedback about the other voters' behavior, the higher participation of other voters in the Treatment than in the Control may affect individuals' self-reported values in the post-treatment survey.

To understand the influence of voting interactions on self-reported values, I asked the same survey questions in Experiment III after participants played voting games for 15 periods *with no feedback*. As reported in Figures H1 and H2, participants value the importance of political participation significantly higher in the Treatment than in the Control in Experiment III, which holds for both Group A and Group B voters. Moreover, conditional on treatment and group assignment, these self-reported values in Experiment III are statistically identical to the self-reported values in Experiment I. Thus, these results suggest that the findings from Experiment I are robust to the influence caused by observations or experience in the experiment.



Note: The numbers at the bottom are the average self-reported valuation of the importance of participation. The label below each set of bars shows the treatment that participants were randomly assigned to. The two left (right) sets of bars reflect elicited values of Group A (B) voters. The importance of participation was elicited after participants finished the Voting Stage and measured by the answer to the question: How important is it for you to vote for a policy? This question was measured based on a scale of 1-9, 1 being not important at all, 5 being neutral, and 9 being extremely important. In the first 15 periods in Experiment III, individuals received no feedback. Thus, their behavior cannot be affected by the choices of other participants, or the voting outcomes of previous election rounds. I cluster the analysis at the individual voter level. There are 12 Group A voters in the Control and 12 in the Treatment. There are 18 Group B voters in the Control and 18 in the Treatment. The reported p-value is the result of the Mann-Whitney Wilcoxon test on individual averages.

Figure H1: Valuation of Participation by Voter and Treatment in Experiment III



Note: The numbers at the bottom are the average self-reported valuation of the importance of participation. The label below each set of bars shows the treatment that participants were randomly assigned to. The two left (right) sets of bars reflect elicited values of Group A (B) voters. The importance of participation was elicited after participants finished the Voting Stage and measured by the answer to the question: How important is it for you to vote for a policy? This question was measured based on a scale of 1-9, 1 being not important at all, 5 being neutral, and 9 being extremely important. In the first 15 periods in Experiment III, individuals received no feedback. Thus, their behavior cannot be affected by the choices of other participants, or the voting outcomes of previous election rounds. I cluster the analysis at the individual voter level. There are 12 Group A voters in the Control and 12 in the Treatment. There are 18 Group B voters in the Control and 18 in the Treatment. The reported p-value is the result of the Mann-Whitney Wilcoxon test on individual averages.

Figure H2: Valuation of Earning More than the Others in Experiment III

I Isolating Effects of Predicting Out-group Voting

A potential factor that may cause strategic effects is that voters may have a prior belief about the behavior of other voters and use this to make voting decisions. In Experiment III, after participants played voting games for 15 periods *with no feedback*, I let them play VG1 and VG2 for 40 periods (20 periods each) with feedback. It should be noted that because participants received no feedback in the previous 15 periods of voting, there should be no influence from playing the previous 15 periods that may cause strategic effects on their voting in the following 40 periods.

To disentangle the strategic effects caused by prior predictions of out-group voting behavior, in these 40 periods, election results were jointly determined by the votes of a group from previous sessions. Specifically, for Group A voters, voting outcomes were decided by their turnout and the votes of Group B voters from a previous session of Experiment I, and vice-versa for Group B voters. To make sure the voting choices of previous participants were *unpredictable* by participants of Experiment III, I created a data set of 40 periods of decisions (20 periods for VG1 and 20 periods for VG2), by randomly drawing voting decisions of Group A and Group B voters from both the Control and Treatment sessions of Experiment I. This data set was used in both the Control and Treatment of Experiment III. Participants in the Control and Treatment of Experiment III knew that the feedback on the other group's voting was randomly drawn from different subjects of previous experiments, which means neither their prior belief nor the feedback of previous periods plays an effective role in strategically responding to the voting of the other group.

When the voting of the out-group is unpredictable, I find similar results that competition for voting power significantly increases voting for both Group A and Group B voters. That is, in VG1, Group A voted about 40% of the time in the Control and 66% of the time in the Treatment (Mann-Whitney, $p = 0.027$); Group B voted about 24% of the time in the Control and 49% of the time in the Treatment (Mann-Whitney, $p = 0.014$). In VG2, Group A voted 9% of the time in the Control and 38% of the time in the Treatment (Mann-Whitney, $p = 0.016$); Group B voted about 32% of the time in the Control and 63% of the time in the Treatment (Mann-Whitney, $p = 0.005$). Comparing these results to observations in Experiment I, there are no significant differences at any conventional

level of statistical significance. These results, together with the results of Experiment I, suggest that the treatment effects of competition for political power are not mainly driven by strategic effects. When outgroup behavior is unobservable or unpredictable, competition for voting power has similar effects in Experiment III as identified in Experiment I, which implies that voting power competition imposes direct effects on both high-power and regular-power voters.

J Historical Data of Participation

In order to investigate the influence of the Civil Rights Movement on voters' participation, I use the data of Current Population Survey, Voting and Registration Supplements 1968 to Present, historical table A-1. This historical data set is available at `https://www.census.gov/data/tables/time-series/demo/voting-and-registration/voting-historical-tim` `html`. The census dataset contains the turnout rate information of four age groups: (1) 18-24 years, (2) 25-44 years, (3) 45-64 years, and (4) 65 years and over. I focus on the youngest and the oldest age groups in the analysis because my theory and experimental findings clearly map to the different life-cycle differences that these two different generations engaged in. The age groups of 25-44 years and 45-64 years may be influenced by the civil rights movement differently based on how long they lived through segregation and suppression, which is an interesting empirical question that is worth future investigation.

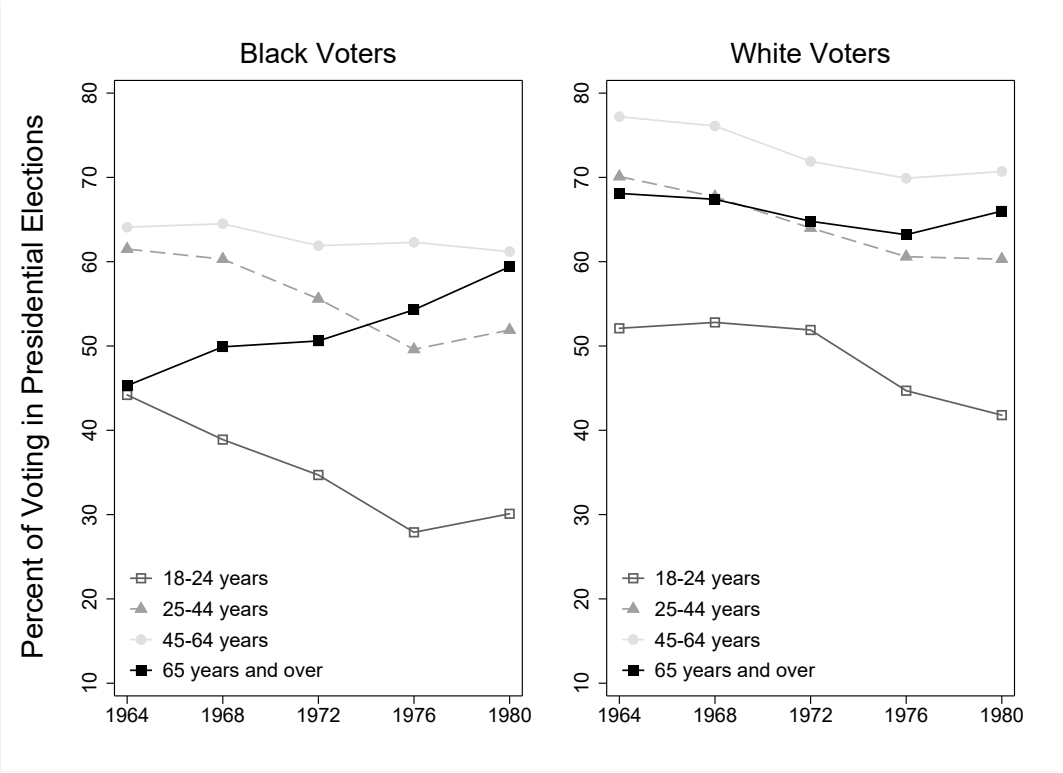
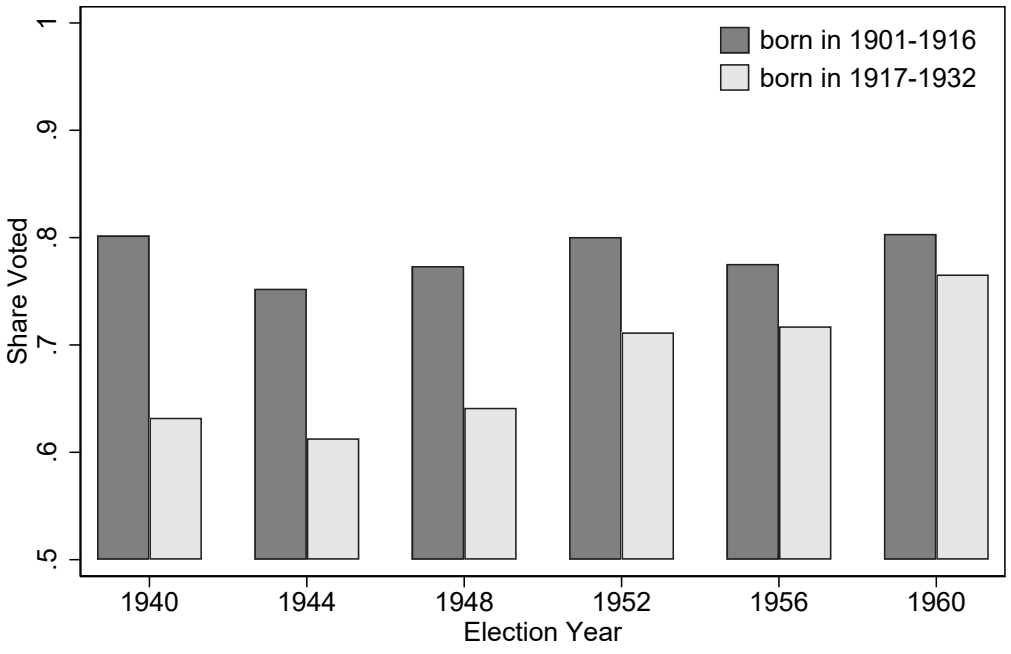


Figure J1: Voting in Presidential Elections by Race and Age Group: 1964 to 1980

To investigate how the ratification of the Nineteenth Amendment affects women's participation, ideally, I should study men's and women's participation since 1920. However, to the best of my knowledge, there has not been a systematic data set that records (self-

reported) participation before 1940 by voters' age and gender in American elections. As a result, I study women's participation during 1940s and 1960s, the closest time window to 1920, based on the data reported in Cascio and Shenhav (2020). This data set is available at `https://www.openicpsr.org/openicpsr/project/117331/version/V1/view`. The time window of the investigation is 20-40 years after the Nineteenth Amendment is ratified, which means it is challenging to disentangle the effect of the suffrage campaign for the Nineteenth Amendment from a variety of confounding factors caused by time, education, and the World War II. As an effort to control for the influence of confounders, I explore the participation of one unique generation, the "Greatest Generation" defined by demographers. I investigate participation of those who were born between 1901 and 1916 (that covers the first half of the Greatest Generation) and those who were born between 1917 and 1932 (that covers the second half of the Greatest Generation). Women's participation is reported in Figure J2. The results are consistent with the theory of this study: Those who experienced the competitive process for political power are more likely to participate.



Source: Cascio and Shenhav (2020).
Note: Statistics are weighted by Cascio and Shenhav (2020), with weights re-normed to average to one within each survey-year. More details are in https://www.openicpsr.org/openicpsr/project/117331/version/V1/view.

Figure J2: US Women's Turnout: 1940 to 1960

K Experiment Instructions

[Instructions for the Control of Experiment I are reported in this section. Instructions for Experiments II and III are similar and available upon request.]

Welcome to our experiment. At the beginning of the experiment, the computer will randomly divide today's participants into sets of 5 participants. During the course of the experiment, you will be in the same set. You only interact with the participants in your own set; any relevant calculations are based on the choices of participants from the same set. Your choices and decisions have no effect on earnings or the assignment of roles of a participant in the other set.

The experiment consists of two parts: Task Part and Voting Part. You will participate in both of the two parts. In Task Part, you will be asked to answer a series of counting-zeros questions. In Voting Part, you will be asked to make your voting choices in a series of voting games. You will be paid \$7 for showing up. You will also earn an additional amount of money in Task Part and Voting Part. Your earnings in the experiment are expressed in Experimental Currency (ECUs). 10 ECUs are worth \$1. Task Part lasts for 15 minutes. Voting Part consists of 40 periods of voting. We will start the experiment with Task Part. After Task Part is completed, we start Voting Part.

Task Part

In Task Part, you are given a series of counting-zero questions. Your task is to solve as many questions correctly as you want within 15 minutes. All participants will be given the same question set to answer in the same sequence. For each of the correctly answered questions, you receive 1 score point.

Earnings of the Task Part: When Task Part is finished, we will rank performance among people in your set of 5 participants. People with higher numbers of questions answered correctly and, hence, the more score points are ranked higher. If two or more individuals answer the same number of questions, the computer randomly determines the ranking of the tied participants. That is, if two players are tied, each will have a 1/2 probability of being ranked above the other and if three players are tied, each will have a 1/3 probability, etc. Your relative performance in Task Part decides your ranking (1st

the highest and 5th the lowest).

All participants will be paid with 20 ECUs for completing Task Part. *Earnings of Task Part are not determined by how many questions you answered correctly or your relative ranking in Task Part. Additionally, how many questions you answered correctly or your relative ranking in Task Part has no influence on your role or potential earnings in Voting Part.*

Voting Part

After all of you have completed Task Part, you move on to Voting Part together. As stated above, there are two groups of voters: Group A voters and Group B voters. *The computer randomly decides who is assigned to which group. How many questions you answered correctly has no influence on the assignment of roles in Voting Part.*

Once your role is determined, you are asked to engage in a series of voting games for 40 periods. In each period, you are asked to decide whether to vote for Policy A, vote for Policy B, or abstain.

- In each set of participants, there are always 2 Group A voters and 3 Group B voters.
- Each Group A voter has <u>two</u> ballots, but each Group B voter only has <u>one</u> ballot.
- Thus, in total Group A voters have 4 ballots and Group B voters have 3 ballots.
- If you are a Group A voter, and you decide to vote for Policy A (B) or abstain, then both of your ballots are marked as Policy A (B) or "Abstain." You only make one voting choice and you cannot split the two ballot tickets.
- If you are a Group B voter, and you decide to vote for Policy A (B) or abstain, then your ballot is marked as Policy A (B) or "Abstain."

The outcome of voting determines your earnings in Voting Part. An example of the tables you will see in the experiment is shown below:[2]

This table tells you the payoffs you and the other members of the group receive for every potential winning alternative. In Voting Part, your earnings <u>*are*</u> determined by whether you are a Group A voter or a Group B voter and which policy wins. That is,

[2]We randomized the sequence of VG1 and VG2 across sessions to avoid order effects. In Experiment Instructions, participants were shown an example of VG1 in sessions in which VG1 was performed first. They were shown an example of VG2 in sessions in which VG2 was performed first.

Voter Type	If Policy A wins	If Policy B wins
Each Group A Voter	25	10
Each Group B Voter	10	20

if Policy A wins, each Group A voter receives 25 ECUs; each Group B voter receives 10 ECUs. If Policy B wins, each Group A voter receives 10 ECUs, and each Group B voter receives 20 ECUs.

Your earnings *are also* determined by whether you vote for Policy A (B) or you decide to abstain. Voting is costly and if you choose to vote *(regardless of how many ballots you have)*, you will pay 3 ECUs for voting for Policy A or Policy B. For example,

- If you are a Group A voter, you choose to vote, and A wins, you receive 25-3 = 22.
- If you are a Group B voter, you choose to vote, and B wins, you receive 20-3=17.
- If you abstain, you do not pay the voting cost of 3.
- If you are a Group A voter, you choose to abstain, and B wins, you receive 10.
- If you are a Group B voter, you choose to abstain, and A wins, you receive 10.

Winning Rule of Voting: *The wining policy in the election is determined by a random draw.* That is, after everyone has made voting decisions, one of the ballots will be randomly selected to decide the winner of that election period. If the randomly selected ballot says "Policy A" then Policy A is declared the winner. If the randomly selected ballot says "Policy B" then Policy B is declared the winner. If the randomly selected ballot says "Abstain," then the computer will draw a new ballot until the outcome of the voting is determined. If everyone abstains, the computer randomly decides whether Policy A or Policy B wins the election. Each Policy is equally like to win.

In each period of voting, the winning policy will be announced. You will also know the information on your earnings, how many votes are for Policy A, Policy B, and how many participants abstain. The winner is determined by a random draw as described above. The distribution of votes is recorded simply for your own information. However, please note that, *whether you and the other participants vote or abstain decides the probability that Policy A and Policy B wins the election.*

Earnings of Voting Part: Voting Part consists of 40 periods of voting. When Voting Part is finished, among the 40 periods 4 will be randomly selected as the periods to be

paid. One period in every ten periods will be randomly selected. Each period is equally likely to be selected. You will be paid based on your role (i.e. Group A voter or Group B voter), who the winning policies are for the selected periods to be paid, and whether you vote or abstain in the selected period of voting. The voting cost is charged based on whether you voted in the randomly selected periods, but not how many times you voted. In total, you will be paid \$7 for showing up and completing the experiment. In addition to your showing up fee,

Your final earnings = Your earnings in Task Part + Your earnings in Voting Part

Your earnings in points will be converted to US dollars. The convention rate is 10 ECUs = \$1. At the end of the experiment, you will be paid privately for your participation. All information collected in this experiment will be anonymous. Neither the experimenter nor other subjects will be able to link your identity to your decisions. In order to maintain this privacy, please do not reveal your decisions to any other participants.

If you have any questions, please raise your hand. Otherwise, please proceed to answer the comprehension quiz shown on the screen. The purpose of these quiz questions is to make sure that you understand the different elements of the experiment. Any unclear points will be explained by the experimenter. Once you have answered all the questions, please press the "Continue" button to proceed. The computer will check your answers.

L Preregistration and Pre-Analysis Plan

A pre-registration and pre-analysis for the study was filed with the Evidence in Governance and Politics (EGAP) Design registry at (https://osf.io/qtv5a). The analysis choices reported in the main text and our research hypotheses were pre-specified in the preregistration. There are no departures from the pre-analysis plan.

Appendix Only References

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