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Abstract

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JEL Classification: C91, D64, D72

Keywords: leaders, Dictator Game, Reciprocity, Citizen-Candidate

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Does "Being Chosen to Lead" Induce Non-Selfish Behavior? Experimental Evidence on Reciprocity*

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This draft: June 12, 2016

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1. Introduction

Central to any analysis of delegated authority is the extent to which an agent acts (or can be induced to act) in the interests of the principals. This may be thought of as designing mechanisms to align the objectives of the agent with those of the principal, so that the former – who will choose actions to maximize his own material payoff – will act in the interests of the latter. A standard view in economics is that in the absence of such mechanisms, the latter will choose solely on the basis of his own preferences.

An alternative view is that individuals often act in "other-regarding" ways, taking account of the welfare of others, rather than simply their own welfare, in choosing their actions. This may be especially true when individuals are put in positions where they are explicitly tasked with making decisions that affect others. Taking the argument one step further, the *fact* of being chosen to make decisions for others induce non-selfish behavior. That is, leadership in itself may induce concerns about followers (see, for example, Burns [1978][1]). A leader may feel responsible toward citizens – not because of any mechanism aligning their interests – but due simply to the knowledge that she is in a position where her decision will affect others. That is, leaders might consider holding office a "public trust", so that they act accordingly, that is acting according to a wider set of interests rather than simply their own. (This alternative view of the behavior of leaders contrasts with a leading political economy model of how leaders behave in office, the "citizen-candidate" model (see Osborne and Slivinski [1996] and Besley and Coate [1997] as the seminal papers), which argues (consistent with the view in the first paragraph) that once elected, leaders have the same preferences they had as private citizens.) Non-selfish behavior by leaders is consistent, for example, with results in experiments on the "dictator game" (in which a "proposer" determines the allocation of an endowment between himself and a passive "responder") show that some, but not all proposers, give part of their endowments to the responders.

However, the extent to which a leader acts non-selfishly may depend on the way in which she came to her position. An elected leader may feel more responsible to those for whom she makes decisions if they elected her than if she were chosen by someone other than them. We see both procedures not only in politics and government, but also in many other organizations: student organizations, religious hierarchies, businesses, academic departments, etc.

[1] For example, "… the genius of leadership lies in the manner in which leaders see and act on their own and their followers' values and motivations." (Burns [1978], p. 19.)

A large empirical literature indicates that there are in fact differences in the behavior of elected and appointed leaders, which we review in section 2.2 below. There is however a clear problem of possible selection bias in comparing elected and appointed leaders (as has been recognized in the literature). Leaders chosen by election may be the ones who care more about the society at large. Hence, differences in behavior between appointed and elected leaders may reflect differences in the characteristics of leaders rather than any effect on their behavior from the procedure *per se* of how they were chosen. A laboratory experiment controlling for other explanations can isolate the effect of the procedure by which one becomes a decision-maker and can thus help determine whether "being chosen to lead" is a sufficient motive to act pro-socially.

Moreover, a laboratory experiment which attempts to isolate the effect of how one was chosen to lead can also address issues of reciprocity, where the literature suggests that simply being a leader is not sufficient to exhibit non-selfish behavior. As Rabin (1993) points out, "people do not seek uniformly to help other people; rather, they do so according to how generous these other people are being." Hence he suggests that when individuals act in other than a purely self-interested way, it is "reciprocity"[2] rather than unconditional altruism that may be the crucial factor. Reciprocity relies on a concept of "you scratch my back, I'll scratch yours". In that regard, an election (as opposed to appointment) seems like a setting where reciprocity would be exhibited such that elected leaders are most likely to reciprocate by acting in the interests primarily of those voters who elected them, i.e. "because you voted for me, I will choose a policy closer to one that benefits you".[3]

Although reciprocal behavior is one of the robust findings of the experimental literature, a further key question is whether material sacrifice must be present to show kindness. In existing experiments on reciprocity, it is. However, in the election of a leader, voters make no material sacrifice in choosing her if voting is costless (or the cost of voting is offset by the intrinsic value of the act of voting). That is, the elected leader does not observe a material sacrifice by the voters.

[2] Sobel (2005) contrasts intrinsic reciprocity with instrumental reciprocity as follows. Instrumental reciprocity is forward-looking selfish behavior, while intrinsic reciprocity is backward-looking, with an individual being willing to sacrifice his own payoff in order to increase (decrease) payoff of someone who was kind (unkind) to him in the previous interaction (see also Cox, et al. [2007]; Cabral et al. [2014]). Throughout the paper, when we refer to reciprocity, we mean intrinsic reciprocity.

[3] To our knowledge, there is little work on reciprocity in elections, and the focus is only on voters. Berg, et al. (1995) present a trust game which is used to measure the reciprocity level of the voters. Hahn (2009) investigates theoretically a two-period voting model where the voters have a reciprocity motive and shows that the past behavior of the chosen parties will affect voter behavior. Finan and Schechter (2012), discussed in section 2, is the only empirical work of which we are aware. Our paper is the first to investigate the reciprocal behavior of leaders.

Another important aspect of the reciprocity is that people reciprocate when they see good intentions (see e.g. Brandts and Charness [2003], Charness and Levine [2007], Falk, Fehr and Fischbacher [2008]). In elections, it is rather difficult for the voters to exhibit good intentions. Especially when a voter votes for a candidate whose views are closest to his, his intent may have been simply considered as self-interest, which thus may generate no response from the elected leader. Therefore, one cannot form hypotheses without theoretically investigating a "citizen-candidate" model with reciprocal preferences a la Dufwenberg and Kirchsteiger (2004) as a sequential reciprocity game. We show theoretically that sacrifice is not necessary to be considered kind. The crucial aspect of being considered kind is to improve the other's payoff. Hence, since electing a candidate to be leader improves her payoff, the elected candidate acts non-selfishly to improve the payoff of the voter under reciprocal preferences. Hence, in the equilibrium the elected leader, rather than choosing the policy that maximizes his own material payoff, chooses a policy toward the voter while the voter still votes for the candidate whose view is the closest.

Our experiment is designed to test the predictions of the theoretical model concerning kindness and reciprocity of leaders. In order to draw conclusions on whether "being chosen to lead" in itself (as well as how one is chosen) induces reciprocal behavior, we introduce a number of controls into our experimental design. First, we have two treatments where all the aspects of the design are identical except for leaders being elected in one treatment and appointed in the other. Comparing the behavior of the leaders across these two treatments will help to identify the effect of reciprocity. Additionally, in our design, there is no possibility of re-election nor re-appointment (that is, no "career concerns"), nor any other explicit mechanism to align the interests of leader and citizen to avoid any forward looking explanation, and all the subjects will be anonymous to avoid the selection bias explanation of electing pro-social people.

Our main results are as follows. We find, consistent with other experimental results on the dictator game, that leaders (i.e., proposers) do not always implement their own preferences once in office, as suggested by the basic citizen-candidate model. However, the extent of other-regarding behavior depends on how the leader was chosen. Elected leaders are less likely to choose policies to maximize their own material payoff than appointed leaders. The direction of other-regarding behavior also differs between elected and appointed leaders. Consistent with reciprocal behavior, elected leaders choose policies that favor the voter rather than the losing candidate, while when a leader is appointed there is no statistically significant tendency to favor the voter over the losing candidate. Hence, we can conclude that "being *elected* to lead" is in itself sufficient to induce pro-

social behavior, where it is not because elected leaders differ in their underlying characteristics from appointed ones.

The plan of the paper is as follows. In the next section we review empirical and experimental tests of leader behavior. Section 3 sets out an underlying theoretical framework as a basis for our experimental set-up. Section 4 describes our experiment in detail and section 5 describes the results. Section 6 provides some interpretation of the results and section 7 contains conclusions.

2. Literature Review on Leader Behavior

In this section we briefly review both experimental and econometric work on whether decision-makers respond to the preferences of those for whom they make decisions in the absence of a mechanism to induce them to do so, as well on how their responses depend on how they were chosen to make decisions.

2.1 Experimental studies

There has been a significant amount of experimental work on social preferences in decision-making, studies which show that when making choices, people take account not only of their own material payoffs, but also appear to care about the material payoffs or beliefs of others (see e.g. Camerer [2003]; Schokkaert [2006]). Taking a costly action that increases the payoff of others – such as in ultimatum, dictator, gift-exchange, or public goods games – may be interpreted as a preference for giving (see e.g. Andreoni [1990]; as a preference for equitable or fair outcomes (see e.g. Fehr and Schmidt, [1999], Engelmann and Strobel [2004]; as an act of altruism or reciprocity (see e.g. Charness and Rabin [2002]; or, as a desire for being seen as behaving fairly (see e.g. Andreoni and Bernheim [2009]; Benabou and Tirole [2006]; Dana, Weber and Kuang [2007]).

When an individual is chosen as a unitary decision-maker (that is, who has sole responsibility for policy) – whether by election or appointment – his role is that of a dictator, who dictates a policy that affects the payoffs of all other citizens. In a typical dictator game, one player (dictator) is asked to allocate a specific sum between himself and another player (recipient). Kahneman, Knetsch, and Thaler (1986) were the first to show that the dictator gave positive rather than zero amounts to recipients. This non-selfish outcome is a very robust finding in the experimental literature (for a summary see Camerer [2003]). It holds in a variety of situations, including even when outcomes are risky (Brock, Lange and Ozbay [2013]).

Explicit consideration of selection of a decision-maker means that we essentially have a two-stage game. In the first stage the leader is determined; in the second, we have a dictator game. This game has a flavor of the gift-exchange game where in the first stage a manager sets a wage which is costly to himself but beneficial to the worker, and in the second stage a worker decides how much effort to exert (which is costly to himself but beneficial to the manager). Although in the unique subgame perfect Nash Equilibrium the worker exerts no effort in response to any wage offer and the manager offers a zero wage, numerous studies have demonstrated experimentally that both the manager and the worker take the costly (to themselves) action benefitting the other party (e.g., Fehr, Kirchsteiger, and Riedl [1993]). The observed behavior is in line with the reciprocity motive where a kind act should be responded to by a kind act.

There are a number of papers that consider experiments looking at implications of delegating decisions (e.g. Charness [2000], Charness, et al. [2012]). More specifically, several papers whether endogenous choice of decision makers (for examples via elections) lead to better outcomes than exogenous choice, where the key question is *what accounts for any improvement*. Selection is one finding, as in Hamman, Weber and Woon (2011), who show experimentally that electoral delegation may lead to full provision of a public good due to electoral selection because social-welfare minded leaders are chosen.

Another argument is that election confers greater legitimacy on leaders, an argument of Dal Bó, Foster and Putterman (2010) in a laboratory experiment and Olken (2010) in a field experiment Brandts, Cooper, and Weber (2014) study a game of coordinating the behavior of employees in a firm performing a common production task by a "leader" via communication (see also Levy, et al. [2011]). Leaders in their experiment (elected or randomly selected) continue to play the coordination game as an employee and are paid in the same manner after becoming the leader. The only choice they could make is concerning the messages they send to group members. A key finding is that elected leaders are able to improve efficiency more than randomly selected ones (they are more effective at moving the group to a better equilibrium via the messages they send). They argue that it is the "mere fact of having been elected appears to give elected leaders higher legitimacy" as in leading the coordination process.[4]

[4] "Leaders who see themselves as legitimately selected to improve their group's outcome exert themselves more to exercise effective leadership (in the context of our experiment, working "harder" by sending more relevant messages)."

Unlike Brandts, et al. (2014), our main focus in explaining why outcomes depend on the process by which a leader is chosen is the *reciprocity* of leader. The receivers are responsible for the choice of the leader in the case of election but not in the case of random appointment. In our setup, the leaders do not send a message instead they are able to make policy choices that uniquely determine the payoff of all the players. Hence, their policy choices will make it possible to identify if the elected leaders reciprocate to the voters who elected them.

Another contribution of our paper is to the many-recipient-dictator game literature. Brandts, Güth, and Stiehler (2006) consider a 3-person game where one player chooses either of the other two to divide a pie or an outside option after inspecting a personality questionnaire the players have answered. They then compare the allocation chosen by such a knowingly selected leader to that chosen by a randomly selected leader. They find, as we do, that knowingly selected leaders give more of the pie than randomly selected ones, with the selector (analogous to the voter in our model) being treated more generously than the third player. A key difference is that the questionnaire stage allows potential candidates to signal (falsely or not) their benevolence.

One should also note the paper by Feddersen, Gailmard and Sandroni (2009) which provided experimental support for an ethical expressive model of voting. They modeled voters as receiving both instrumental and expressive utilities from voting. In the experiment, subjects were asked to choose between ethical and selfish options. Furthermore, their novel design enabled manipulation of the pivot probabilities. They found that as pivot probabilities decline, instrumental voting is less likely while ethical expressive voters may continue to vote or switch from abstention to voting for the ethical option.

2.2 Empirical Tests

We divide our summary into two questions: does it matter for non-selfish behavior how leaders were chosen, that is, whether they were elected or appointed?; and, if elected, do leaders reciprocate towards those who elected them?

2.2.1 Empirical Studies on Elected versus Appointed Leaders

There are a number of econometric studies on differences in outcomes when policy-makers are elected versus appointed, primarily comparing judges or regulators. Though there is clear evidence of such differences, these results often do not shed light on whether it is the *way* that policy-makers came to office *per se* that accounts for these differences. There are a number of

reasons for this. First, the method of being chosen and legal length of tenure may imply re-election or re-appointment incentives, so that differences reflect how they are retained in office rather than how they originally came to office. (In contrast, in our experiment, there is only a single "term of office", so that re-election or re-appointment concerns can play no role.) Second, there is evidence that differences in behavior may reflect different characteristics of policy-makers due to the process by which they are chosen, rather than effects of the choice process *per se*. That is, policy-makers may differ in their preferences, knowledge, or overall competence, where this difference is systematically related to the way in which they were chosen. (In our experiment, subjects are assigned randomly, so there can be no systematic difference in characteristics.) Third, differences may reflect other institutional differences that are correlated with procedures by which leaders are chosen, where differences may affect the way officials are chosen, so there is reverse causality. [5]

On the first point – the importance of incentives for retention – there are numerous studies that argue that leaders (for example, governors in U.S. states) who are not eligible for re-election act differently than those who are.[6] These results do not shed light on how the method of coming to office affects behavior. Nor do they cleanly show how re-election incentives in themselves affect behavior, so that differences in performance could be interpreted as a simple indication of the extent of selfish versus non-selfish behavior. Elections serve a selection as well as a disciplining role (consistent with our second point above), so that comparing the performance of reelection-eligible leaders to that of "lame-duck" leaders in their last allowed term in office need not capture whether the latter act in the public interest. Findings on the behavior of appointed versus elected judges are argued in part to reflect re-election incentives. Gordon and Huber (2007) find that near elections, judges facing re-election give harsher sentences, which they argue represents an obvious electoral motive. Lim (2013) presents evidence strongly supporting the importance of such electoral incentives in explaining different outcomes for elected versus appointed judges.

On the second point, a number of studies argue that different outcomes associated with differences in the method of selection reflect systematic differences in policymaker characteristics due to the selection procedure itself. Lim (2013) argues that appointed judges are of higher quality, as do Choi, Gulati, and Posner (2010) and Iaryczower, Lewis and Shum (2011). Besley and Payne

[5] Hanssen (2004), for example, shows that U.S. states with strong political competition between parties tend to have appointed rather than elected judges.

[6] See, for example, Besley and Case (1995, 2003), List and Sturm (2006), Alt, Bueno de Mesquita and Rose (2009), Ferraz and Finan (2011), or Aruoba, Drazen, and Vlaicu (2015).

(2013) find that when judges are appointed, there are significantly fewer anti-discrimination charges being filed, which they argue is due to elected judges being more likely to rule in favor of plaintiffs in such cases This is because elected judges are more likely to have pro-employee preferences due to selection, as well as being more likely to find in favor of employees due to re-election incentives. Lim also finds that different ways of choosing judges affects the homogeneity of their preferences as well as the apparent ability of judges.

In short, differences in the behavior of appointed and elected judges found in econometric studies are attributed to selection or incentive effects (see Iaryczower, Lewis and Shum [2011] for a discussion of empirically disentangling these effects), rather than on the effect of how they are chosen *per se* on the decisions they make.

Another area in which differences in the behavior of appointed versus elected officials has been studied is with regulators. Perhaps the best-known study is that of Besley and Coate (2003) who find that decisions of elected regulators are more likely to reflect voters' preferences (as opposed to those of the electricity industry) than are decisions of appointed regulators. As in the case of judges, it is selection and incentives for the former type of regulators that are central to explaining different outcomes.[7]

Burden, et al. (2010) consider differences in the behavior of elected versus appointed election officials and find that the former are more in favor of policies thought to promote turnout. They argue that their results support the idea that appointed officials are more insulated from voter preferences, while "elected officials are more likely to express attitudes and generate outcomes that reflects their direct exposure to the policy preferences of voters." Their study does not address the question of whether this reflects selection effects or attitudes generated by the method by which the officials came to their job, more in line with the arguments we are making. Additionally, once elections are introduced in previously non-democratic settings, elected leaders choose more community-oriented policies (Baldwin and Mvukiyehe [2011], Martinez-Bravo et al. [2011] and Luo et al. [2007]). Grossman (2014) ran a lab-like-field experiment in Uganda with the leaders of the farmer association and county residents. In line with the empirical evidence, the elected leaders of farmer associations act more pro-socially than the appointed leaders to the residents who are

[7] They point out that electoral effects on appointed regulators are diffused in that while voters elect the politicians who appoint the regulators (so that there are disciplining and selection effects in theory), regulatory decisions are only one of many issues on which voters choose directly elected officials.

members of the association, but both elected and appointed leaders act equally selfishly against a non-member resident.

2.2.2 Empirical Studies of Reciprocity by Elected Leaders

Whether politicians reciprocate to voters who voted for them independent of electoral incentives is an intriguing question, but one on which we could find no empirical studies. One sort of reciprocity is rewarding turnout in favorable areas. For example, in the most recent U.S. presidential election, politicians in Philadelphia felt that the large vote share for Obama might be rewarded.[8]

We note that this is different from simple "vote-buying" where voters (usually core supporters) are rewarded *conditional* on voting for a candidate. An excellent interesting paper in this regard is that of Finan and Schechter (2012) who find – based on survey information on vote buying in a municipal election combined with experiment-based measure of reciprocity – that individuals are targeted for vote buying are those who have shown reciprocal behavior. Since a key issue in vote buying is compliance on the part of voters, their results indicate that reciprocity may play an important role in elections. Their paper does not however provide evidence on reciprocity by elected officials to voters. To our knowledge, there is no formal work on this.

Hypotheses:

On the basis of existing work, we summarize possible types of leader behavior:

Selfish: The leader implements her type as the policy.

Other-regarding preferences: The leader implements a policy different from her type but with no difference across treatments. This would be as in other experimental studies of the dictator game where there is no focus on the way the dictator was chosen. When the procedure by which a leader is chosen has no effect on his policy choice, but the policy is not her selfish one, this would be

[8] "Will Philly reap rewards for big Obama turnout?", *Philadelphia Inquirer*, November 8, 2012

> The city's support for Obama was again impressive - more than 557,000 votes were cast for the president, representing more than 85 percent of the city's total. "People in Washington will take note of that," said political consultant Larry Ceisler.
>
> At the traditional day-after luncheon at the Palm restaurant, labor leader John J. Dougherty - whose electricians union runs its own formidable get-out-the-vote operation - echoed that sentiment. "The numbers coming out of Philly were really significant," he said. "I don't know how much [federal] money is going to be available, but I would think that Mayor Nutter and the congressional delegation should be at the front of the list."

consistent with the fiduciary argument that it is simply the fact of holding office that induces non-selfish behavior.

Reciprocity: The leader implements her type as a policy if she is appointed; she implements a policy other than her type as policy (favoring the voter) if she is elected, as in the work of Rabin (1993) on static reciprocity and Dufwenberg and Kirchsteiger (2004) on sequential reciprocity (see section 3 for details). In this case, we could reject the fiduciary argument in favor of reciprocity.

Mixed Fiduciary-Reciprocity Motives: The leader implements a policy different from her type in both cases, but an elected leader favors the citizen more than an appointed leader. Neither of the polar non-selfish possibilities describes leader behavior, so that a leader appears to be motivated by both fiduciary and reciprocity motives.

Our "citizen-candidate" type model differs from the typical dictator game in three ways. The first is its two-stage nature as pointed out in section 2.1, where in the first stage the leader is determined by either election or appointment, and in the second stage, we have a dictator game. Second, there are two citizens toward whom the dictator may show "kindness", namely the voter (or "ordinary" citizen, the term applying to both treatments) and the losing candidate. While these roles are theoretically indistinguishable in the appointment treatment, they are very different from the dictator's perspective in the election treatment if reciprocity is present.

The third difference between our citizen-candidate model and the typical dictator game is that in our set-up, players have most preferred positions on a line, so that behavior – selfish or non-selfish – takes the form of a leader choosing a policy position rather than an amount to give the other player. This implies at least two differences. First, although the leader dictates the policy, even implementing his own type would yield a positive payoff to others. Though formally equivalent to the standard dictator game (in that the payment for participation could include the absolute value of the distance between the leader's and the voter's type), this "framing" characteristic could affect the leader's propensity towards non-selfish outcomes. Second, while in the standard dictator game, the dictator cannot make a negative transfer, in our set-up a leader who does not implement her type as policy could move *away* from another player, giving him an even lower payoff than implied by the leader simply choosing her own type as policy. For example, when the ordinary citizen and the losing candidate are on different sides of the leader in our set-up, moving toward the citizen lowers the losing candidate's payoff relative to the case in which the leader acted selfishly.

The citizen-candidate model with an election brings a nice twist to the standard gift exchange game. In the first stage, the voter takes a non-costly action, deciding for which candidate

to vote. If the candidate were known to implement her type if elected, the voter would simply vote for the closer candidate, as in the standard citizen-candidate model. However, if the leader moves toward the voter, things are more complicated. If the voter chooses the candidate whose position is farther away, she may reciprocate by moving her policy more towards the voter than the closer candidate would. If this effect were sufficiently strong, the equilibrium policy when the farther candidate is elected might be *closer* to the voter than if the nearer candidate were elected. In this case, voting for the further candidate might actually lead to a higher payoff and hence be motivated by voter self-interest rather than voter "kindness".

3. Theory

In this section we set out the basic model of reciprocity and solve for equilibrium behavior of candidates and voters. Particularly, we incorporate the reciprocal preferences into the standard set-up of the spatial model of voting.

As in the standard model of Downs (1957), each agent, candidates and voters, has a most preferred policy (his or her "type"), x for the voter and y_i for candidate i, for $i = 1,2$. The direct material payoff of the agents is single-peaked and decreases monotonically as the actual policy moves away from the type. It is modeled as the absolute difference the actual policy p_i and type, that is, $-|p_i - y_i|$ for candidate i and $-|p_i - x|$ for the voter.[9] Clearly, if the individuals care only their material payoff, then in the unique subgame perfect equilibrium, each candidate chooses her own type as the policy and hence the voter votes for the candidate whose type is the closest.

Once elected, the winning candidate may want to reciprocate to the voter who elected her. To incorporate reciprocity into the spatial voting model, we follow the framework of Dufwenberg and Kirchsteiger (2004) which extends Rabin (1993) to sequential games, where the utility of the leader is equal to *Material Payoff* $+ \alpha$(*voter's kindness*)(*leader's kindness*).

The key ingredient of this framework is to define the kindnesses of the agents. In the literature, the change in the material payoff with respect to a reference point is considered as the measure of kindness. In our setup, voter's kindness is the difference between leader's material payoff and her reference payoff; similarly leader's kindness is the difference between voter's material payoff and his reference payoff. The reference payoff can be considered as the norm and is based on the best and worst payoffs created by the other player among the efficient outcomes (see also Charness

[9] Adding an endowment to the payoffs will not change the analysis.

and Haruvy [2002]). In a voting setup, among the efficient outcomes, the best policy choice of the leader for the voter would be to choose the voter's type as the policy, i.e. $p_i = x$, generating a payoff of 0 to the voter; and the worst policy for the voter would be for the candidate to choose her own type, i.e. $p_i = y_i$, generating a payoff of $-|y_i - x|$. The "equitable payoff" is the average of the two, which is the "reference point" against which to measure how generous the elected leader is towards the voter, that is $\frac{1}{2}(0 - |y_i - x|)$. Hence, the elected leader's "kindness" to the voter is the difference between the actual payoff from the implemented policy choice and the equitable payoff, that is $-|\tilde{\tilde{p}}_i - x| - \frac{1}{2}(0 - |y_i - x|)$, where $\tilde{\tilde{p}}_i$ is the leader's belief about the voter's belief on the policy choice of the leader.

The voter's kindness towards a candidate is measured analogously. The voter's actions are simply to vote for candidate 1 or to vote for candidate 2. Among the set of Pareto efficient allocations, the best the voter can do for a candidate is to vote for her (so that this candidate will determine the policy of $\tilde{\tilde{p}}_i$ generating a payoff of $-|\tilde{\tilde{p}}_i - y_i|$); and the worst thing is to vote for the other candidate (so that the other candidate will determine the policy choice of $\tilde{\tilde{p}}_j$ generating a payoff of $-|\tilde{\tilde{p}}_j - y_i|$ where $\tilde{\tilde{p}}_j$ is the leader's belief about the voter's belief on the policy choice of the other candidate if elected. The average of these payoffs determines the equitable payoff as reference point and the voter's kindness to candidate 1 is the difference between her actual payoff if he votes for her and the equitable payoff. Reciprocity is the product of the elected candidate's kindness to the voter and the voter's kindness to this candidate (see also Hahn [2009]). On the other hand, the utilities of the losing candidate and the voter are simply their material payoff since they are not in the position of reciprocating a kind action.

Given that utilities depend on the beliefs of the players, this voting game becomes a l psychological games (see Geanakoplos, Pearce and Stacchetti [1989]), in particular a sequential psychological games with reciprocity incentives. Hence, we characterize the sequential reciprocity equilibrium defined by Dufwenberg and Kirchsteiger (2004) for these type of games. The sequential reciprocity equilibrium requires that each candidate chooses a policy which maximizes her utility given beliefs and the voter chooses the candidate who chooses a policy that maximizes the voter's utility given that each candidate will follow her equilibrium strategy at other histories. Additionally, it requires that the initial beliefs are correct.

Theorem 1 says that when the leader is determined by election, if the players have reciprocal motives, there is a unique sequential equilibrium such that (i) each candidate chooses a policy

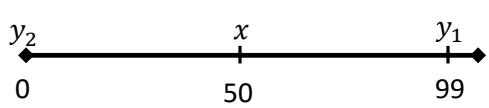
between her own type and the voter's type, inclusive, (ii) the candidate with a type closest to the voter's type choses a policy that is closest to the voter type, (iii) *(off-equilibrium)* the further candidate moves more but not it is not sufficient enough to be elected, (iv) the voter votes for the candidate whose type is the closest.[10] The voter votes for the closest candidate is particularly interesting since he knows that a candidate reciprocates by moving closer to the voter who chose her. In other words, while this voter behavior is obvious if the voter knew that candidates were selfish (that is, if the voter knew that $p_1 = y_1$ and $p_2 = y_2$, he would vote for the candidate whose y_i is closer to x), we have shown that the same voting principle applies in equilibrium when reciprocity is present.

Theorem 1: (Reciprocity - Election) When the leader is determined by election, for any $\alpha > 0$, there exists a unique sequential reciprocity equilibrium, such that for any $i, j = 1,2$ and $i \neq j$,

- **(i)** if $x \leq y_i$ then $x \leq p_i \leq y_i$; and if $x \geq y_i$ then $x \geq p_i \geq y_i$
- **(ii)** $|p_i - x| < |p_j - x|$ when $|y_i - x| < |y_j - x|$
- **(iii)** *(off-equilibrium)* $|y_i - p_i| < |y_j - p_j|$ when $|y_i - x| < |y_j - x|$
- **(iv)** the voter votes for the candidate i, such that $|y_i - x| < |y_j - x|$.

In addition to testable predictions highlighted in Theorem 1, in its proof, we also provide the characterization of the policy choice of each candidate for each realizations of the types. The following example highlights the nature of the solution as well as the predictions of the theorem.

Example. Suppose that $y_1 = 99$, $y_2 = 0$, and $x = 50$, as in the following diagram:



Without loss of generality, take $\alpha = 1/3$, then, we would have

$$p_1 = \frac{1}{2}(50 + 99) + \frac{1}{4}(99 - 50) - \frac{1}{2}|p_2 - 99| + 3 = 86.75 - \frac{1}{2}|p_2 - 99| + 3$$

[10] It may be worth mentioning that the specific choice of material payoff functions or the reference point is not important. In other words, the elected leader's policy choice will be toward to voter provided that the candidate's payoff increases when the voter votes for her in comparison to her reference payoff.

$$p_2 = \frac{1}{2}(50+0) - \frac{1}{4}(50-0) + \frac{1}{2}|p_1 - 0| - 3 = 12.5 + \frac{1}{2}|p_1 - 0| - 3$$

implying that $p_1 = 60$ and $p_2 = 39.5$. Hence, each candidate moves toward the voter (see Theorem 1 (i)). The policy choice of candidate 1, whose type is closer to the voter, is closer to the voter's type since $|p_1 - x| = (60 - 50) = 10 < 10.5 = (50 - 39.5) = |p_2 - x|$ (see Theorem 1 (ii)). The policy choice of the candidate 2, whose type is further to the voter, is not enough to be elected although she moves more than the closer candidate (see Theorem 1 (iii)): $|y_2 - p_2| = 39.5 > 39 = |y_1 - p_1|$. Hence, the voter votes for candidate 1 who is the closest candidate (see Theorem 1 (iv)).

On the other hand, when the leader is appointed, there is no role of the voter. Hence, the voter cannot exhibit a kind act, i.e. voter kindness is zero. Therefore, even if a candidate is reciprocal, she does not need to reciprocate and she picks the policy that maximizes her material payoff, i.e. each candidate chooses her own type as the policy.

4. Experimental Design

The aim of our experiment was to investigate whether policy concerns change when one is a political leader. We had two treatments differing in the procedure for the determination of the leader. In one the leader was appointed [Appointment Treatment]; in the other, the leader was elected [Election Treatment]. Instructions for each treatment are in the appendix.

The experiment was run at the Experimental Economics Lab at the University of Maryland. There were 120 participants, all undergraduate students at the University of Maryland. We conducted four sessions for each of the treatment (15 participants per session, i.e. 60 participants per treatment). No subject participated in more than one session. Participants were seated in isolated booths. The experiment is programmed in z-Tree (Fischbacher [2007]).

At the beginning of each session, each subject was randomly assigned one of two roles: "candidate" or "citizen." There were twice as many candidates as citizens. The assigned roles stayed fixed for all 20 rounds (until the end of the experiment). In the beginning of each of the 20 rounds in a session, all participants were randomly put into groups of 3 people each. Hence, there could be no "reputation" effects as the session proceeded. Each group consisted of two candidates and one citizen. Independently from the role (candidate and citizen) that he is assigned, in each round every participant was assigned a *type* randomly. A type was any integer number from 0 to 100 drawn from a uniform distribution, which is essentially his most preferred policy. Unlike the fixed roles, types

assigned changed from one round to the next. We balanced the random draws by using the same sequence of random numbers for each treatment, so the random value draws for each session in Election treatment are matched with the random draws for the corresponding session of the Appointment Treatment.

After the citizen was informed about the type of each candidate, in the Election treatment, the citizen chose one of the candidates. In the Appointment treatment, one of the candidates was randomly appointed. The elected candidate in the Election treatment, or the appointed candidate in the Appointment treatment was informed about the types of both the opponent candidate and the citizen and was then given the authority to decide which policy would be implemented. A policy was required to be an integer number from 0 and 100, where individuals learned the outcome of each round before the next took place.

Earnings in each round depended on the distance between type and policy. Formally, the earnings in a round were 100 - |TYPE – POLICY| Experimental Currency Units (ECU) where 1 USD = 5 ECU. It is important to note that all participants, both citizens and candidates have their earnings computed in this fashion, and the policy choice of the winning candidate affected the earnings of both opponent candidate and the citizen. Once all 20 rounds were finished, one round out of the 20 randomly was picked, and the earnings made on that round were the final earnings of the experiment in addition to a $5 participation fee.

5. Experimental Results

5.1 Do leaders behave non-selfishly?

Our first question is: Do the leaders pick their own type as policy? In Table 1, we present the fraction of leaders who choose a policy different than their own type. In the appointment treatment, 26.25% of the leaders pick such a policy. In the election treatment, this percentage is 40%. The Mann-Whitney test indicates that the difference in behavior between elected and appointed leaders is statistically significant. Hence, as in earlier studies of the dictator game, we reject universal selfish behavior, but note that non-selfish behavior is significantly greater for elected than appointed leaders.[11]

[11] There is the possibility of a selection effect, since the voter tends to choose the closest candidate in terms of policy preference, implying that elected candidates may be on average closer than appointed leaders. Hence, to control for this possibility, as a robustness check, we also looked at the set of observations restricted to chosen leaders who are closer to

Table 1: Do Leaders Behave Non-Selfishly?
(Fraction of observations where Policy is not Leader's Type)

	Election	Appointment	Difference	Mann-Whitney test
Policy is not Leader's Type	.4	.2625	.1375	z=4.13
	(0.025)	(0.022)	(0.033)	p=0.00
Number of cases	160	105		

Standard errors in parentheses. Number of observations: Election=400; Appointment=400

Furthermore, in order to investigate the heterogeneity in individual subjects' behavior, we classify each subject into one of three categories based on their choice of policy of (i) always choosing his own type, (ii) sometimes choosing his own type, sometimes not, and (iii) never choosing his own type. Clearly, the ones in first category are selfish and the ones in the third category are non-selfish individuals. In the appointment treatment, 42.5% of the subjects are identified to be selfish, and 5% were identified to be non-selfish. In the election treatment, 32.5% of the subjects are identified to be selfish, and 10% were identified to be non-selfish. Also Figure 1 provides the cumulative distribution functions of the fraction of instances of policy different than the winner's type for each treatment.

the citizen. It turns out to be that the result in the Table 1 is robust, i.e. the fraction of choosing a policy different than the leader's own type is .3919 in the election treatment and .2398 in the appointment treatment (z=3.6, p=0.00).

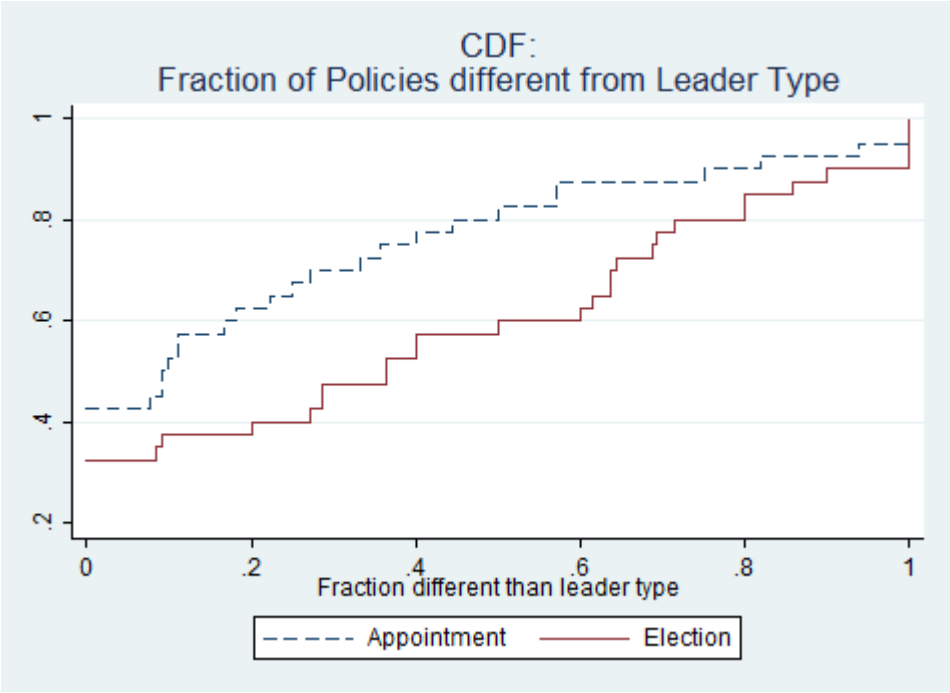


Figure 1. Cumulative distribution functions of the fraction of instances of policy different than the winner's type for each treatment.

5.2 To whom do leaders respond?

We next ask to whom leaders respond. Is it only the voter, or is it also the other candidate? Does the response depend on where the voter and the other candidate are located relative to the leader? And, by how much does the leader respond?

We begin by asking: when leaders choose a policy other than their own type, do they respond only to voters or to all citizens, that is, including the losing candidate. We find that in the appointment treatment, the policy favors losing candidate and the citizen equally, however in the election treatment, the chosen policy favors the voter.

To investigate this question, we generated a dummy variable that is equal to 1 if the absolute difference between the losing candidate's type and the policy is less than the absolute difference between the losing candidate's type and the leader's type (i.e. when the leader picks a policy to favor the losing candidate); and we generated another dummy variable that is equal to 1 if the absolute difference between the citizen's type and the policy is less than the absolute difference between the citizen's candidate's type and the leader's type (i.e. when the leader picks a policy to favor the citizen's type).

Table 2: Toward Whom Do Leaders Move When They Move?

	Voter	Losing Candidate	Proportion test
Election (N=160)	.763 (.034)	.563 (.039)	z=3.78 p=.00
Appointment (N=105)	.8 (.039)	.705 (.045)	z=1.60 p=.11
Election Leader is in center (N=70)	.714 (.054)	.229 (.050)	z=5.76 p=.00
Appointment Leader is in center (N=30)	.6 (.089)	.4 (.089)	z=1.55 p=.12

Standard errors in parentheses. Since we allow for integer amounts, being in Center is defined as*: votertype-1>winnertype>losertype+1 or votertype+1<winnertype<losertype-1 so that there is always room for the leader to compromise if she wants.*

When the leader picks a policy other than his own type, in the appointment treatment, the policy 80% favored the citizen and 70.5% favored the losing candidate. Two-sample test of proportions yields these percentages are *not* significantly different (z=1.60, p=0.1099). When the leader picks a policy other than his own type, in the election treatment, the policy 76.25% favored the citizen and 56.25% favored the losing candidate. Two-sample test of proportions yields these percentages *are* significantly different (z=3.78, p=0.0002).[12]

We note that with only one voter, the elected leader knows who is responsible for his victory – and hence to whom to respond -- whereas with many voters, he is unable to attribute victory to a

[12] The same information may be summarized as follows

Election Treatment	**Voter**		
Loser	**Away**	**Toward**	**TOTAL**
Away	14	56	70
Toward	24	66	90
TOTAL	38	122	160

Appointment Treatment	**Voter**		
Loser	**Away**	**Toward**	**TOTAL**
Away	6	25	31
Toward	15	59	74
TOTAL	21	84	105

single person. We cannot address this in our single voter set-up though our framework does allow us to distinguish a non-voting citizen (that is, the losing candidate) from the voting citizen responsible for the leader's election, where the response is more towards the latter. (In a separate paper, we experimentally investigate these issues by allowing more than one citizen.) Nevertheless, it is important to note that limiting the number of citizens to one allowed us to directly test the effect of reciprocal preferences in a voting environment.

The difference in behavior looks especially clear when we consider the cases where the leader chooses a policy other than his type and his type is *between* the losing candidate and the ordinary citizen (voter). If the policy he chooses is closer to the losing candidate's type, then we can say that he favors the losing candidate, while if it is closer to the voter's type we can say that he favors the voter citizen. The appointed leader favors the citizen 60% and the losing candidate 40% ($z=1.55$, $p=0.12$, $N=30$). The elected leader favors the citizen 71.4% and the losing candidate 22.9% ($z=5.76$, $p=0.00$, $N=70$).[13] These results are summarized in Table 2.

It is also illuminating to consider how the likelihood that the leader moves towards the ordinary citizen (i.e., the voter) depends on the position of the voter relative to the leader. (Remember that in the appointment treatment, the leader is chosen at random from the two candidates.) We know from Table 1 that taken over all cases, a policy other than the leader's type is chosen 40% of the time if the leader was elected and 26.25% of the time in the leader was appointed. As predicted in theory section, when the voter is between the two candidates, he voted for the closer candidate (the closer candidate is elected in 111 cases but the further candidate is chosen in 19 cases). Nevertheless, an off-equilibrium prediction of the theory is that voting for the further candidate should generate a strong response. Again we see in Table 3 that this is the case, with a much larger proportion of elected leaders moving towards the voter when the voter chooses the further candidate than when the voter chooses the closer candidate (or than in the appointment treatment). But again as predicted by the theory, the further candidate does not move enough more to make it worthwhile. It is important to note that the small number of cases in which this occurs ($N=19$)[14] makes it difficult to place too much weight on this result keeping in mind that this is an off-equilibrium.

[13] It is also worth mentioning that when the leader is in the middle, in the appointment treatment, 25.86% of the leaders pick a policy other than their own type; and in the election treatment, this percentage is 35.71%. This percentages are in line with the percentages in Table 1.

[14] The 19 observations represented the behavior of 14 different subjects.

Table 3: Reciprocity to Voters

Percentage Choosing a Policy toward Voter who is Between the Two Candidates

	Election	Appointment	Mann-Whitney test
Leader is the *further* candidate (NOBS of ordinary citizen in middle and the further candidate is the leader)	.579 (.113) N=19	.228 (.047) N=79	z= 3.00 p= 0.03
Leader is the *closer* candidate (NOBS of ordinary citizen in middle and the closer candidate is the leader)	.345 (.045) N=111	.176 (.053) N=51	z= 2.19 p= 0.03
Mann-Whitney test	z= 1.93 p=0.05	z= 0.70 p= 0.48	

Standard errors are in parentheses. Since we allow for integer amounts, being in the Center is defined as*: winnertype-1>votertype>losertype+1 or winnertype+1<votertype<losertype-1 so that there is always room for the leader to compromise if he wants. Also, winnertype=0 and winnertype=100 are excluded to avoid any movement to favor moving toward the voter.*

Finally, we ask not simply whether the leader chooses a policy other than his type, but by how much he moves. As we have seen, elected leaders are more likely to move toward the voter than the losing candidate, while appointed leaders who move do not distinguish between the two types of citizen. Hence, the question of how much the leader moves is most interesting when we consider not any movement but movement in the direction of the voter, which accounts for 71.3% of the movements in the election treatment.[15] In considering the amount by which a leader moves, the absolute amount of movement is not really a good indicator of whether the leader moves "a little or a lot" when comparing the appointment and election treatments. To take an example, suppose the ordinary citizen's type is 17, and the elected leader with a type of 19 picks 17 but the appointed leader with type of 60 implements 57. We would not then conclude based on the size of the movement that the appointed leader favors the ordinary citizen more than the elected leader.

This issue, without excluding any data, can be handled by defining the measure of relative movement

$$\mu = \frac{policy - leader\ type}{voter\ type - leader\ type}$$

[15] This is a conservative way of counting the moving towards the voter. If policy becomes closer to the voter but is on the other side of the voter (for example, if the leader's type is 10, the voter's type is 20, and the policy is 21), we did not count it as a movement toward the voter. If we included such cases as movements toward the voter, then the percentage becomes 76.3%.

The ratio μ must be between 0 and 1 if the leader picks a policy toward (but not, as in the previous footnote, on the other side of) the voter. It is greater than 0 (if the leader chooses his own type as the policy), but no greater than 1 (if the leader chooses voter's type as the policy), monotonically rising the more the leader moves toward the voter relative to the difference in types.

Table 4a: How Much Do Leaders Move towards Voters?

	Average Movement Relative to Initial Distance (μ)		
	Election (N=114)	**Appointment** (N=77)	**Mann-Whitney test**
μ	.381 (.034)	.266 (.030)	z=2.315 p=.021

Standard errors are in parentheses. These values are conditional on moving toward the voter (0<μ≤1).

When a leader moves toward the voter, i.e. 0<μ≤1, the size of the movement relative to the difference between the leader's and the voter's type is significantly in the election than that in the appointment treatment (see Table 4a and Figure 2). Hence, not only are leaders chosen by election much more likely to move policy toward the voter than leaders chosen by election, but the amount of by which they move policy towards the voter is considerably larger as predicted by the reciprocity model.

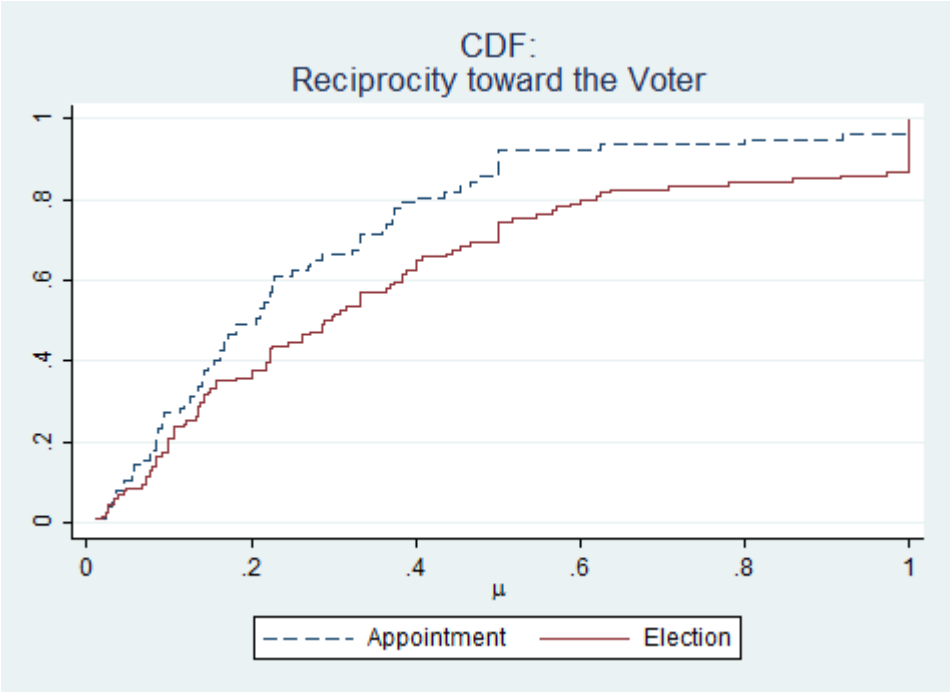


Figure 2. Cumulative distribution functions of average movement Relative to initial distance toward the voter (μ) for each treatment.

Another prediction of the reciprocity model is that how much the leaders move toward the losing candidate could not be a result of reciprocal motive and hence should not show any difference across treatments. To test this prediction, analogous to μ, we could look at how much a leader moves toward the losing candidate:

$$\mu' = \frac{policy - leader\ type}{loser\ type - leader\ type}$$

Indeed, when a leader moves toward the voter, i.e. 0<μ'≤1, there is no significant differences in the relative movement across treatments (see Table 4b and Figure 3).

Table 4b: How Much Do Leaders Move towards Losing Candidate?

Average Movement Relative to Initial Distance (μ')

	Election (N=87)	**Appointment** (N=68)	**Mann-Whitney test**
$\boldsymbol{\mu'}$	.221 (.025)	.245 (.024)	z=1.783 p=0.07

Standard errors are in parentheses. These values are conditional on moving toward the losing candidate (0<μ'≤1).

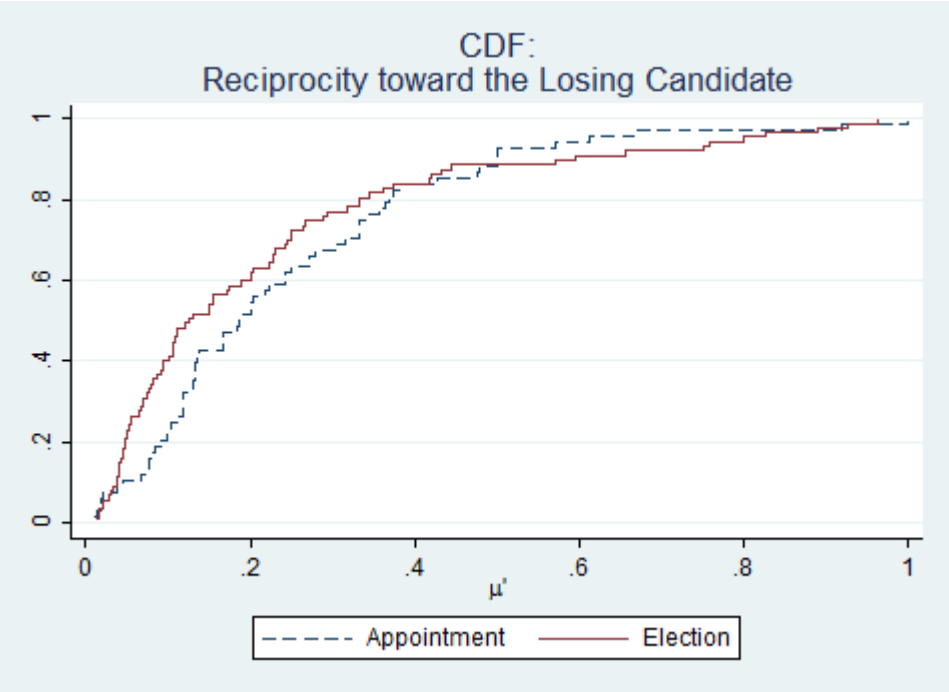


Figure 3. Cumulative distribution functions of average movement Relative to initial distance toward the losing candidate ($\boldsymbol{\mu'}$) for each treatment.

6. Interpreting the Results

We believe that these results may shed light on two literatures. The first is the dictator game itself. What is new in our approach is adding a previous stage in which the unitary policymaker is chosen. Two (related) results stand out – that the procedure by which a leader is chosen has a significant effect on his behavior as leader; and, second, that elected leaders, in their non-selfish behavior, favor voters (or "ordinary" citizens) rather than losing candidates. In contrast, appointed leaders show no statistically significant difference when they do not choose their type as policy in the movement towards ordinary citizens and losing candidates.

The importance of the procedure by which the unitary policymaker is chosen for his behavior once in office is unmistakable from our results. Leaders chosen by election are significantly more likely to display non-selfish behavior, that is, to choose a policy towards citizens than those chosen by appointment. Moreover, the direction in which they move is significantly different – while appointed leaders who do not play their type show no tendency towards either of the two citizens, elected leaders clearly favor the voter. And, the amount by which a leader favors the voter is much higher when the leader is elected rather than appointed.

In neither case should the result be surprising, but perhaps for different reasons. In the case of a leader chosen by random appointment, there should be no difference between the two citizens. While it is true that the losing candidate "lost" in the selection process, the ordinary citizen had no chance to be the leader. It should therefore not be surprising that the leader treats them symmetrically.

In contrast, when the leader is elected, the role of the two citizens with respect to the leader is crucially different. The winning candidate is leader because the voter chose him. This suggests not only why behavior of leaders is different across the two treatments, but also what non-selfish behavior may reflect.

If leaders who did not implement their type as policy were simply acting altruistically (or in a fiduciary manner as discussed below), there should be no difference between leaders who owe their position to election versus appointment, nor any difference in whom they favor. The fact that appointed leaders sometimes act non-selfishly is consistent with "kindness" or leaders feeling responsible. The fact that more leaders act non-selfishly in the election treatment suggests that reciprocity is likely at work in explaining non-selfish behavior in this case. Elected leaders owe their position to the voter. They direct their non-selfish behavior much more towards voters than the other citizen; and, they respond much more to voters than appointed leaders do. This

suggests that an elected leader would be especially likely to move towards the voter who elected him if he was the candidate farther from the voter. Such an observation would strengthen the conclusion of reciprocity in when leaders are elected, but it arises in too small a number of cases to be statistically significant.

Additionally, our results indicate that material sacrifice is not necessary to be considered kind; if one's action is improving the well-being of the other he may be still considered kind. Particularly, in the Election treatment, although the elected leader does not observe a material sacrifice by the voters, she acts non-selfishly.

The second literature for which our results may be especially relevant is the citizen-candidate model. What our results indicate is that once elected to be leaders, citizens do *not* simply carry over the preferences they had as candidates in making policy. While this is true of leaders in general, it is even truer of elected leaders. This behavior of a leader is consistent with the "fiduciary" model discussed above, where the *fact* of holding office may affect a leader's behavior. The citizen-candidate approach should probably be modified to include the response of successful candidates to citizens.

The fact that elected candidates leaders do not automatically carry over their preferences as citizens to their behavior as leaders does not mean that these preferences are irrelevant for predicting what a candidate will do once in office. Leaders do not pick policies very different than their type. But, it is clear they often do not simply play their candidate type. They consider citizen preferences in making their choices, even when there is no re-election motive. Hence, voters face the task of predicting what a candidate will do once in office, where his known preferences as candidate are not a perfect indicator.

7. Conclusions

In this paper we have considered the dictator game much studied in the experimental literature, but have added a previous stage where the dictator is chosen either by election or appointment in order to answer whether being chosen to lead induce non-selfish behavior. Though many experimental studies have found that such a policymaker acts non-selfishly when choosing how to divide a payoff between himself and another player, the question of why is harder to answer. By comparing the behavior of unitary policymakers chosen in different ways, we believe one can shed light on this issue. The behavior of elected leaders, when compared to those who are appointed strongly suggests that a key factor is reciprocity.

Focusing on the importance of the procedure by which a policymaker is chosen sheds light on a number of other issues as well. First, of course, is that procedure by which one has been chosen for office affects behavior once in office. Perhaps this is unsurprising, but we are unaware of other experimental work that addresses this point and that comes to such a clear conclusion.

The behavior of elected leaders in our study also indicates that the simple model of "citizen-candidates" is incomplete. Candidates who become leaders do not (and should not be expected to) simply carry over the preferences as citizens. Models of the behavior of elected leaders should take into account that being a leader in itself may affect behavior. In models of political economy, leaders are not just social-welfare-maximizers, but are political agents with preferences. But what these preferences are and how leaders behave appears more complicated than simply self-interest which is easy to predict. Models of leaders need to be more developed.

We view this study as only the first step in investigating the question of how leaders act, especially elected leaders. One direction is further experimental work, distinguishing perhaps voting from non-voting citizens, or leaders who can and cannot be re-elected. This should be complemented by looking at data on the policies chosen by leaders and whether they favor the voters who voted for them, `even when they are term-limited. Our results suggest that further experimental and econometric study of the leader responsiveness to citizens and how this is affected by the procedure through which they came to office should yield rich insights.

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Appendix A

Instructions:
[Elections treatment]

General

This is an experiment in decision-making. If you follow the instructions and make good decisions, you can earn a significant amount of money, which will be paid to you at the end of the session. The currency in this experiment is called tokens (5 tokens = 1USD). The experiment consists of 20 identical decision rounds. During the experiment it is important not to talk to any other subjects. Please turn your cell phones off and remember that if you have any questions, just raise your hand.

Roles

Before the beginning of the experiment you will be randomly assigned a role. The two possible roles you can be assigned are `Citizen' and `Candidate'. There will be twice as many candidates as citizens. Your assigned roles will stay fixed for all 20 rounds until the end of the experiment. That is, if at the beginning of the experiment you were assigned the role of a candidate (citizen) you will keep this role for the entire experiment.

In the beginning of each round, all participants will be randomly grouped into groups of 3 people each. Each group will consist of two candidates and one citizen. Since you are most likely to be matched with different participants for each round, it will be impossible to track candidates and citizens between rounds. However, there will always be two candidates and one citizen in every group.

Candidate Names

Those who get the role of candidates will also be assigned a name in each round. In each group, names are assigned randomly with each candidate having the same chance to be named `A' or `B'. Notice that if you are a candidate, your name could potentially change from one round to another.

Types

Independently from the role and name that he/she is assigned, in each round every participant (candidates and citizens) will be assigned a Type randomly. Types can be any integer number from 0 to 100 and will be drawn from a uniform distribution. That means that each participant's type can take any of those integer values with equal probability. Unlike the fixed roles, types assigned will change from one round to another.

Policies

A policy is what the winning candidate gets to decide once elected. An admissible policy is any integer number from 0 to 100. The interplay between the value of your type and the policy actually implemented is what determines your earnings.

Development of each round

For each group, each of the 20 rounds consists of an independent election process with the following sequence of events:

1. Candidates are informed about their names and types for the current round. Citizens are informed about their types as well.
2. In each group, the citizen is informed about both candidates' types and must decide his/her vote.

3. Once citizen submits his/her vote, a winner is proclaimed and everyone is informed about who is elected candidate.
4. The elected candidate is informed about the types of both the opponent candidate and the citizen and is then given the authority to decide which policy will be implemented.
5. Everybody learns the policy implemented and his/her own earnings for the round. Earnings are computed by the following rule:
    a. Everybody starts each round with 100 tokens.
    b. Discount (D) for each participant is computed as, the absolute value of the difference between type and policy, i.e. D = |TYPE – POLICY|.
    c. Final earnings of the round are computed as 100 initial tokens minus the corresponding discount, that is, 100 – D tokens. Notice that all participants, either citizens or candidates get their earnings computed in this fashion.

Final earnings

Once all 20 rounds are finished, the computer will pick one round out of the 20 randomly. The earnings you made on that round will be your final earnings of the experiment. We will convert tokens you earned in this round into US dollars by dividing them by 5. In addition, you will receive a participation fee of $5.

Are there any questions?

[Appointment Treatment]

General

This is an experiment in decision-making. If you follow the instructions and make good decisions, you can earn a significant amount of money, which will be paid to you at the end of the session. The currency in this experiment is called tokens (5 tokens = 1USD). The experiment consists of 20 identical decision rounds. During the experiment it is important not to talk to any other subjects. Please turn your cell phones off and remember that if you have any questions, just raise your hand.

Roles

Before the beginning of the experiment you will be randomly assigned a role. The two possible roles you can be assigned are `Citizen' and `Candidate'. There will be twice as many candidates as citizens. Your assigned roles will stay fixed for all 20 rounds until the end of the experiment. That is, if at the beginning of the experiment you were assigned the role of a candidate (citizen) you will keep this role for the entire experiment.

In the beginning of each round, all participants will be randomly divided into groups of 3 people each. Each group will consist of two candidates and one citizen. Since you are most likely to be matched with different participants for each round, it will be impossible to track candidates and citizens between rounds. However, there will always be two candidates and one citizen in every group.

Candidate Names

Those who get the role of candidates will also be assigned a name in each round. In each group names are assigned randomly with each candidate having the same chance to be named `A' or `B'. Notice that if you are a candidate, your name could potentially change from one round to another.

Types

Independently from the role and name that he/she is assigned, in each round every participant (candidates and citizens) will be assigned a Type randomly. Types can be any integer number from 0 to 100 and will be drawn from a uniform distribution. That means that each participant's type can take any of those integer values with equal probability. Unlike the fixed roles, types assigned will change from one round to another.

Policies

A policy is what the leader gets to decide once appointed. An admissible policy is any integer number from 0 to 100. The interplay between the value of your type and the policy actually implemented is what determines your earnings.

Development of each round

For each group, each of the 20 rounds consists of an independent appointment process with the following sequence of events:

1. Candidates are informed about their names and types for the current round.
2. Each citizen is informed about his/her type.
3. A citizen has no say in leader appointment. Whether candidate A or B is appointed is determined randomly by the computer with both candidates having the same chance to be appointed. That is, each candidate of a group has 50% percent of probability to win the office.
4. The appointed candidate is informed about the types of both the opponent candidate and the citizen. He/she is then is given the authority to decide which policy will be implemented.
5. Everybody learns the policy implemented and his/her own earnings for the round. Earnings are computed by the following rule:
    a. Everybody starts each round with 100 tokens.
    b. Discount (D) for each participant is computed as, the absolute value of the difference between type and policy, i.e. D = |TYPE – POLICY|.
    c. Final earnings of the round are computed as 100 initial tokens minus the corresponding discount, that is, 100 – D tokens. Notice that all participants, either citizens or candidates get their earnings computed in this fashion.

Final earnings

Once all 20 rounds are finished, the computer will pick one round out of the 20 randomly. The earnings you made on that round will be your final earnings of the experiment. We will convert tokens you earned in this round into US dollars by dividing them by 5. In addition, you will receive a participation fee of $5.

Are there any questions?

Appendix B

Proof of Theorem 1:

By definition of the sequential reciprocity equilibrium, each candidate chooses a policy which maximizes her utility given beliefs and the voter chooses the candidate who chooses a policy that maximizes the voter's utility given that each candidate will follow her equilibrium strategy at other histories. Additionally, it requires that the initial beliefs are correct.

Without loss of generality, consider the node where that Candidate 1 is elected. Then, she chooses a policy, p_1, that maximizes

$$-|p_1 - y_1| + \alpha\left[-|p_1 - x| - \tfrac{1}{2}(0 - |y_1 - x|)\right] \times \left[-|p_1 - y_1| - \tfrac{1}{2}(-|p_1 - y_1| - |p_2 - y_1|)\right],$$

Equivalently,

$$\max_{p_1} -|p_1 - y_1| + \tfrac{1}{2}\alpha\left[-\tfrac{1}{2}|y_1 - x| \times |p_1 - y_1| - |p_2 - y_1| \times |p_1 - x| + |p_1 - x| \times |p_1 - y_1|\right]$$

The presence of absolute values in the objective function means that one must do a case-by-case analysis in order to find the solution to the maximization problem.

<u>Case 1</u>: $x < y_1$

First observe that $x \leq p_1 \leq y_1$. Then, the above equation may be written

$$\max_{p_1} -(y_1 - p_1) + \tfrac{1}{2}\alpha\left[-\tfrac{1}{2}|y_1 - x|(y_1 - p_1) - |p_2 - y_1|(p_1 - x) + (p_1 - x)(y_1 - p_1)\right]$$

implying a first-order condition for $x < p_1 < y_1$

$$1 + \tfrac{1}{2}\alpha\left(\tfrac{1}{2}|y_1 - x| - |p_2 - y_1| - 2p_1 + x + y_1\right) = 0$$

To analyze this, define $T_1 \equiv \frac{1}{2}(x + y_1) + \frac{1}{4}(y_1 - x) - \frac{1}{2}|p_2 - y_1| + \frac{1}{\alpha}$, which implies

$$p_1^* = \begin{cases} x & \text{if} \quad T_1 \leq x \\ T_1 & \text{if} \quad x < T_1 \\ y_1 & \text{if} \quad y_1 \leq T_1 \end{cases}$$

<u>Case 2</u>: $x > y_1$

Similarly, first observe that $x \geq p_1 \geq y_1$.Then, we may write

$$\max_{p_1} -(p_1 - y_1) + \tfrac{1}{2}\alpha\left[-\tfrac{1}{2}|y_1 - x|(p_1 - y_1) - |p_2 - y_1|(x - p_1) + (x - p_1)(p_1 - y_1)\right]$$

implying a first-order condition for $x > p_1 > y_1$

$$-1 + \tfrac{1}{2}\alpha\left(-\tfrac{1}{2}|y_1 - x| - |p_2 - y_1| - 2p_1 + x + y_1\right) = 0$$

Define $S_1 \equiv \frac{1}{2}(x + y_1) - \frac{1}{4}(x - y_1) + \frac{1}{2}|p_2 - y_1| - \frac{1}{\alpha}$, implying

$$p_1^* = \begin{cases} y_1 & \text{if} \quad S_1 \leq y_1 \\ S_1 & \text{if} \quad y_1 < S_1 < x \\ x & \text{if} \quad x \leq S_1 \end{cases}$$

Given the above policy choices of the candidates, it is straightforward to show that $|p_i - x| < |p_j - x|$ when $|y_i - x| < |y_j - x|$; *(off-equilibrium)* $|y_i - p_i| < |y_j - p_j|$ when $|y_i - x| < |y_j - x|$; and the voter votes for the candidate i, such that $|y_i - x| < |y_j - x|$. ■