Online Appendix for "An Experimental Study of Electoral Incentives and Institutional Choice"[*]

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Comments on the Theory

Readers familiar with Maskin and Tirole (2004) and other pandering models will notice that my exposition differs from the conventional assumptions that there are two "periods" of policymaking (one before and one after the election) and that voters only have preferences over policy, which imply that voters' preferences over politicians' types are *induced* by their preferences over policy. Describing voters' preferences as comprising two components (payoffs from policy and from the politician's type) is mathematically equivalent, but has the advantage that it is easier to describe to subjects in the experiment and reduces other unnecessary complications such as having subjects play an irrelevant extra step in the game or the possibility that subjects fail to recognize their induced preferences.

Voter welfare can be measured in terms of the expected frequency with which the policy matches the state of the world. In the pandering equilibrium, the policy is always $p = A$, which matches the state only when $\omega = A$ (where the policy is both "popular" and "correct"), so the voter's welfare is α (when $\omega = B$, the "popular" policy is "incorrect"). In contrast, if politicians were to use their expertise, the probability that $p = \omega$ is 1 while if politicians ignore re-election and pursue their own visions of public policy, the probability the policy matches the state is equal to the probability that the politician is congruent, which is π. Relative to these alternatives, pandering involves a welfare loss if $\alpha < \pi$, a condition that I impose on the experimental parameters.

To better understand the theoretical predictions, it is useful to understand what is *not* an equilibrium of this game—that is, what kind of behavior game theory rules out as being consistent with rational behavior given the structure and incentives of the situation. We can first rule out the possibility that incumbents act as trustees in the way that Burke or Hamilton

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would exhort them to do. Suppose that incumbents choose to match the policy to the state, regardless of their type. If so, voters will not learn anything about the incumbent's type from observing p. In game theoretic terms, Bayes' Rule implies that voters' posterior beliefs are identical to their prior beliefs. As a result, voters are indifferent between the incumbent and challenger and any strategy can be considered a best response. Now consider any generic strategy for the voter where ρ_A denotes the probability of re-electing the incumbent if $p = A$ and ρ_B denotes the probability of re-electing the incumbent if $p = B$. No matter what the voter does, noncongruent incumbents will have an incentive to choose a policy that is contrary to what is in the voter's best interest for at least one state of the world. To see this, suppose that the probability of re-electing the incumbent does not depend on the policy choice so that $\rho_A = \rho_B$; in this case, p does not affect the incumbent's electoral payoff and noncongruent incumbents will always choose $p \neq \omega$. If, instead, politicians are rewarded for choosing A so that $\rho_A > \rho_B$, then noncongruent incumbents will receive a higher expected payoff of $y + z\rho_A > z\rho_B$ for choosing the "wrong" policy for the voter when the state is $\omega = B$. Similarly, if politicians are rewarded for choosing B, then noncongruent incumbents will choose the "wrong" policy when the state is $\omega = A$. The intuition here is that because voters can only condition re-election on policy choices, they cannot prevent a noncongruent incumbent from following her own policy interests. In other words, either form of policy-based voting encourages the non-congruent politician to choose a policy opposed to the voter's true interests.

We can also rule out an equilibrium in which incumbents pursue their own policy interests without regard to re-election. To see this, suppose that incumbents do choose policies only in line with their own interests so that regardless of the state, congruent incumbents always choose $p = \omega$ and noncongruent incumbents always choose $p \neq \omega$. In this case, a Bayesian voter can learn something about the incumbent's type from observing the policy choice p. Specifically, such a voter reasons that because state A is ex ante more likely, an incumbent choosing $p = A$ is more likely to be congruent than an unknown challenger. Conversely, an incumbent choosing $p = B$ is more likely to be noncongruent than the challenger.[1] Therefore, if incumbents only pursue their private interests, then the voter's best response is to re-elect the incumbent if and only if $p = A$. But because incumbents care more about re-election than their policy goals (the assumption that $z > y$), they will deviate and choose $p = A$ to guarantee re-election regardless of their type or the true state of the world.

Analysis of Experience

In a simple approach to investigating whether subjects adapt their behavior with more experience, I divide the data into the early, middle, and late rounds of Part 1. Figure A1 summarizes the changes in subjects' behavior across these three periods for each role, condition, and information set. The figure reveals no evidence of adaptive behavior in the 50/150 Condition for voters or incumbents, with the one exception that noncongruent

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[1]In the former case, Bayes' Rule implies $\Pr(T_I = C | p = A) = \frac{\alpha\pi}{\alpha\pi + (1-\alpha)(1-\pi)}$, and $\alpha > \frac{1}{2}$ implies that the posterior belief is greater than π. In the latter case, the posterior belief is $\Pr(T_I = C | p = A) = \frac{(1-\alpha)\pi}{(1-\alpha)\pi + \alpha(1-\pi)}$, which is less than π when $\alpha > \frac{1}{2}$.

politicians are more likely to pursue their policy interests in later rounds than in the early rounds. There is greater evidence of adaptation in the 25/175 Condition. As subjects gain more experience, they are more likely to pursue re-election and choose policy A, even when their policy interests prescribe otherwise. This holds for congruent incumbents, who choose policy A in 11% of early periods and 25% of late periods, as well as noncongruent incumbents, whose corresponding figures are 15% of early periods and 36% in late periods. There is a similar pattern of gradual adaptation for voters in the 25/175 Condition. They re-elect incumbents who choose policy B in 63% of early periods, which then drops to 47% in the late periods. Subjects appear to adjust their behavior over time in the direction of the equilibrium predictions, but the culmination of this process by the end of the experiment appears to remain far from rational strategic play.

[Figure 1 about here.]

Subject-level Heterogeneity

In addition to masking changes in behavior over time, the aggregate results reported in the paper may conceal the possibility that there is between-subject heterogeneity. To investigate this, I computed two measures of strategic behavior for each subject. For the rounds in which the subject played the incumbent's role, I computed the proportion of choices consistent with pandering ($p = A$) out of the opportunities for pandering (congruent types when $\omega = B$ and noncongruent types when $\omega = A$). The corresponding measure for voting behavior is the proportion of rounds a subject voted against the incumbent when the policy was B.

Figure A2 presents the distribution of subjects' strategic sophistication for each role. The upper part of the figure shows that most subjects indeed refrained from pandering: 59% of subjects never pandered. Only 18% of subjects engaged in policy pandering at least half of the time, and of these subjects, only two of them did so at every possible opportunity. Thus, there is little heterogeneity between subjects in terms of their propensities to engage in pandering. Most did not do it at all, and only a very few engaged in it with great frequency.

[Figure 2 about here.]

The lower part of Figure A2 shows a great deal of heterogeneity in voting patterns. Subjects were roughly split between those who usually voted for the incumbent (53%) and those who voted against them (47%). At the extremes, about 23% of subjects always re-elected the incumbent when $p = B$ while 17% of subjects always voted them out of office. Incumbents who chose policy B were re-elected half the time not because individual subjects voted randomly but because half of them voted in a manner consistent with strategically rational play and half did not.

Open-ended Explanations of Behavior

The responses that subjects gave to the open-ended survey question asking them to describe their decision process provide some additional insights into their behavior. Most subjects

gave brief responses, many of which are vague or muddled. For example, some subjects stated reasons along the lines of "to make the most money" or "I used the probablities to make decisions," and some subjects described rather than explained their behavior. Such responses suggest that many subjects either could not articulate their reasoning process or did not engage in much reasoning at all. This is not too surprising given the novelty and complexity of the game they played. Nevertheless, it was possible to identify patterns in the responses and to place them into a handful of categories. The modal types of responses involved maximizing individual payoffs (28%) or using probabilities to make their decisions (26%). While these responses suggest that many subjects attempted to be selfish utility-maximizing agents, a few subjects (5%) stated reasons that were more pro-social (e.g., "I tried to make sure that everyone would benefit most from my desicions"). Some subjects interpreted the structure of the policy payoffs as a "rule" to be followed (17%). A very small number of subjects did articulate reasons for their decisions consistent with game theoretic logic: 8% recognized that choosing policy A would get them re-elected while 5% realized that incumbents who chose A were more likely to be congruent. These subjects indeed exhibited more sophisticated behavior than others, as their average pandering rate was 48% (compared to 15% for other subjects) and the average rate of voting out incumbents who chose policy B was 80% (compared 41%).

Sample Explanations of Institutional Choice

Judicial Power

- "If a politician does not face re-election, he has no incentive to 'pander' to voters and thus gains maximum 'utils' (or whatever term you would like to use to describe satisfaction in his/her decision-making) by voting based off of his/her principles. If I, acting as the politician, vote with my values under this system, I am guaranteed the maximum payout of 200 points."

- "Because it is the easiest one to predict since there is no reelection. Reelection supplies the biggest reward hence once that is taken off the table the intentions are more clear."

- "I chose this rule because politicians probably choose policies based on public opinion and less on personal feelings. This rule allows the politician to choose the policy without facing a re-election, so they can choose based on their own opinion rather than subject to a voter's choice."

- "Seems to be the time when the politican will be most honest"

Representative Democracy

- "This has the most predictable outcome, it would seem to me. Therefore I have the largest chance of being able to gain as many points possible, given that I know the system, and thus the largest bonus."

- "I found Rule 1 to be the most straightforward, and since I did fairly well in Part 1 and am comfortable with the workings, I chose Rule 1."

- "I did fairly well with this rule in Part 1 and think that it is more likely that I will continue to succeed earning the maximum amount with this rule than with the other new rules."

- "I chose rule one since I was most confortable with the previous rules and feel a good odds of getting the max pay off with the same rules as we just used."

Direct Democracy

- "Most dependent on myself. In part one, there's a chance what I select will give me zero points, in part 2, the politician has more of an incentive to lie in order to acrue points. This is the best chance (though perhaps not statistically) to earn maxium momey."

- "Round 3 gives the voter the most power to decide policies, so it seems to be the round that will most likely earn the most money for the voter"

- "Rule 3 is the only rule in which the voter has direct control (although random) control over the outcome. Under Rule 1, the politician has all of the decision making, leaving my bonus points up to him. Under Rule 2, the voter cannot even punish the politician for his choice."

Context Effects

In the electoral accountability game, laboratory voters provide weak incentives for politicians to pander and laboratory politicians fail to exploit these tendencies to maximize expected payoffs. Because subjects played a game with exactly the same structure as that analyzed by Maskin and Tirole (2004), we might infer that the behavioral assumptions underlying equilibrium theory (expected payoff maximization, Bayesian inference, mutual consistency of players' strategies) do a poor job characterizing real human behavior in even these simplified political environments. But an alternative explanation is that the inconsistencies were caused by the use of political framing in the experiment's instructions. The argument is that when political context is used, it primes subjects to rely on whatever knowledge and beliefs about politics they bring from outside the laboratory. More specifically, the concern is that their political knowledge crowds out any incentives induced by the reward structure of the experiment. (To some extent, such crowding out might be desirable to the extent that one views the intent of the experiment as an investigation of political reasoning rather than a test of abstract strategic thinking.)

To test whether political context might have affected behavior, I conducted two additional treatments in which I varied the framing of the instructions. In the *Economic Context* treatment, the rules, instructions, and procedures were identical to the 25/175 Condition

except that the incumbent was called the "worker," the voter was called the "manager," the challenger was called the "applicant," the policy choice was called the "action choice," and the election was called the "retention decision." In the *Abstract Context* treatment, these terms were replaced by "Player 1," "Player 2," "Computer," "Action 1," and "Action 2." I conducted four sessions of the Abstract Context treatment with 54 subjects and three sessions of the Economic Context treatment with 48 subjects. If it is the case that context primes social beliefs that crowd out incentives, then we would expect to observe more policy voting and pandering in the Abstract Context treatment than either the baseline Political Context or the Economic Context treatment.

[Table 1 about here.]

Table A1 compares the three behaviors of interest across the different contextual frames.[2] The first row shows that there are no context effects on voting behavior when the incumbent chooses $p = B$. The second row shows that context does affect policy choices, but not in the way that the above argument about framing suggests. The most "pandering" occurs in the Economic Context (29%), and the least occurs in the Abstract Context (15%); these differences are statistically significant ($\chi^2_{(2)} = 19.25, p < 0.01$). These results suggest that context seems to enhance rather than inhibit or crowd out strategic thinking. Indeed, the economic context might also increase subjects' willingness to act selfishly or opportunistically. In contrast, removing any kind of substantive context reduces the frequency of strategic behavior. The lower half of Table A1 seems to suggest that meaningful context also has an effect on institutional choice, as over 50% of subjects in the political and economic contexts choose Judicial Power compared to only 37% in the abstract setting, but this difference is not statistically significant.

Overall, meaningful context seems to allow subjects to reason about their actions in ways that they might do in natural settings, while abstract context simply confuses them. This finding is consistent with the psychology literature on logical reasoning that finds that people are better at reasoning about logical rules when they are framed as social rules or permissions (e.g., Cosmides and Tooby 1992, Ortmann and Gigerenzer 2000) rather than abstract logical tasks (Wason 1968). The similar results for the political and economic contexts also suggest that general features of accountability relationships—who makes decisions and whether agents can be punished—might matter more than specific beliefs about politics or economics, although this claim is speculative and requires further research.

References

Cosmides, Leda and John Tooby. 1992. Cognitive Adaptations for Social Exchange. In *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, ed. J. Tooby J. Barkow, L. Cosmides. Oxford University Press pp. 163–228.

Maskin, Eric and Jean Tirole. 2004. "The Politician and the Judge: Accountability in Government." *The American Economic Review* 94(4):1034–1054.

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[2]I include only data from the 25/175 Condition since the payoffs are different in the 50/150 Condition.

Ortmann, Andreas and Gerd Gigerenzer. 2000. Reasoning in economics and psychology: Why social context matters. In *Cognition, Rationality, and Institutions.* Springer pp. 131–145.

Wason, Peter C. 1968. "Reasoning about a rule." *The Quarterly Journal of Experimental Psychology* 20(3):273–281.

Table A1: Context effects

	Political	Abstract	Economic
Policy Voting	45% (393)	46% (238)	45% (318)
Pandering	21% (476)	15% (345)	29% (301)
Institutional Choice			
Judicial Power	50%	37%	52%
Representative Democracy	24%	35%	33%
Direct Democracy	26%	28%	15%
	(54)	(54)	(48)

Note: Number of rounds for voting and policy choices, number of subjects for institutional choice)

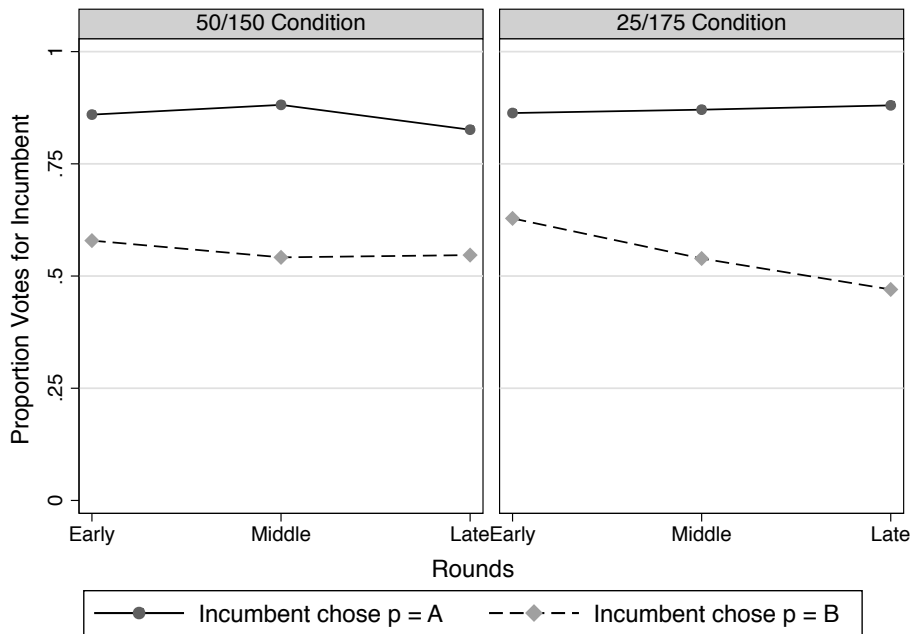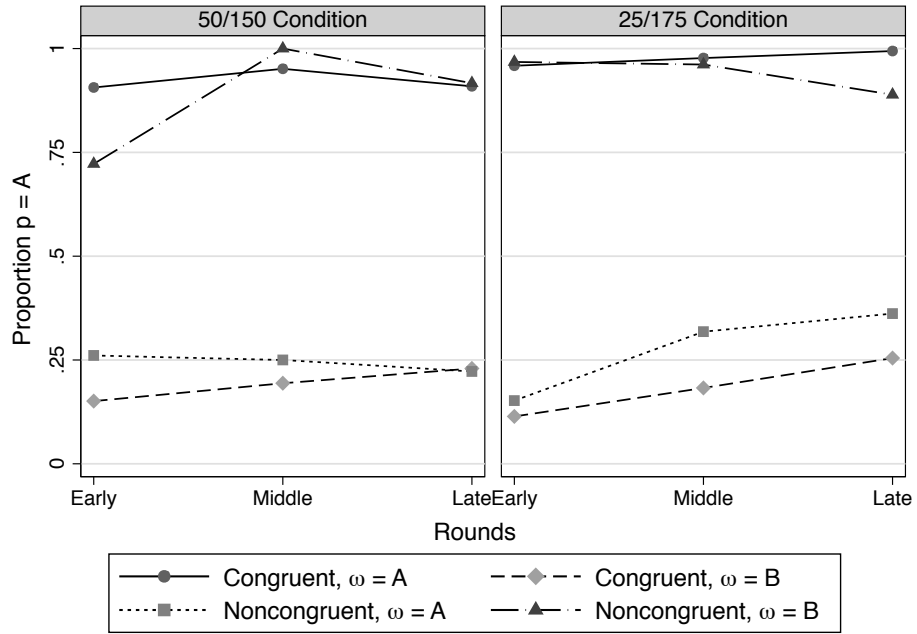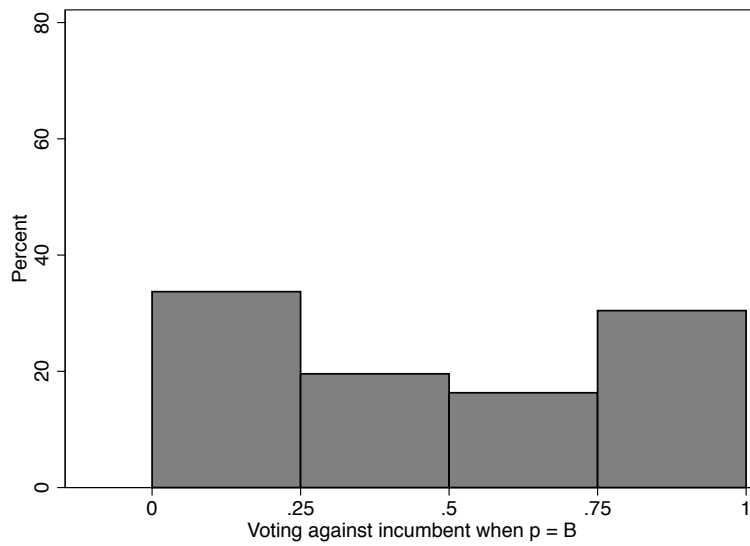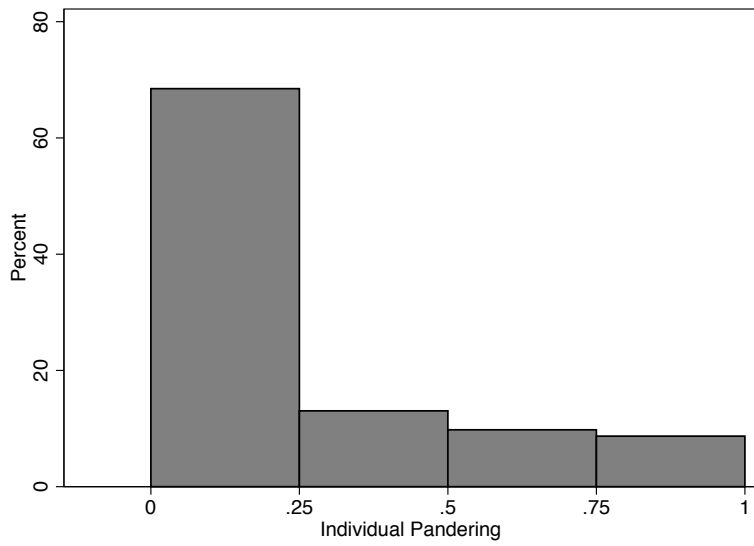Figure A1: Behavior over time in the Representative Democracy Game

Figure A2: Heterogeneity in subjects' strategic behavior

General Instructions

Introduction

This is an experiment in political decision-making. The *** has provided funds for this research. If you follow the instructions closely and make appropriate decisions, you may make a considerable amount of money. In addition to the $5 participation payment, these earnings will be paid to you, in cash, at the end of the experiment.

During the experiment, all earnings will be denominated in points, which will be converted to cash at the rate of $1 per 100 points. The exact amount you receive will be determined during the experiment and will depend partly on your decisions, partly on the decisions of others, and partly on chance. You will be paid your earnings privately, meaning that no other participant will find out how much you earn. Each participant has a printed copy of these instructions and may refer to them at any time during the experiment.

If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk, exclaim, or try to communicate with other participants during the experiment. Also, please ensure that your cell phones and personal belongings are turned off and put away. If you intentionally violate the rules, you will be asked to leave the experiment and may not be paid.

Parts, Rounds, Roles, and Matching

This experiment consists of two parts. In each part, you will make decisions in one or more rounds. **Each round is a separate decision task.**

There are two roles in the experiment. In some rounds you will act as a voter and in others you will act as a politician. At the beginning of every round, one voter is randomly matched with one politician, and it is unlikely that you will be matched with the same participant in two successive rounds.

You will not know the identity of the other participant you are matched with in any round, and your earnings for each round depend only on your action in that round and the action of the participant you are matched with in that round.

Instructions for Part I

Overview of Decision Tasks

Part I consists of 30 rounds. **At the end of the experiment, <u>6 of these rounds</u> will be randomly selected for payment.**

Every round consists of a **policy stage** and an **election stage**, and the sequence of each round is as follows:

1. Before the policy stage, the computer will select three values:

    a. The <u>politician's type</u>, which is either *matching* or *opposed*.

    b. The <u>challenger's type</u>, which is also either *matching* or *opposed*.

    c. A <u>target</u>, which is either A or B.

2. In the policy stage, the politician observes his or her type and the target and then chooses a <u>policy</u>, which can be either A or B.

3. In the election stage, the voter observes the policy and chooses whether to <u>re-elect the politician or to elect the challenger</u>. (The voter does not observe the politician's type, the challenger's type, or the target.)

Random Selection of Types and Targets

In order to select the types and targets, the computer will randomly select three numbers at the beginning of each round: one for the politician (T), one for the challenger (C), and one for the target (X). Each number will be a whole number between 1 and 100, and each number (including 1 and 100) is equally likely to be selected. The three numbers are selected independently. That is, when one number is selected, it does not affect how the other numbers are selected.

Numbers translate to types and targets as follows:

- There is an <u>80% chance</u> that the politician is matching:
    - If T ≤ 80, then the politician is *matching*.
    - If T > 80, then the politician is *opposed*.

Appendix: Instructions for 25/175 Condition (political context)

- There is an 80% chance that the challenger is matching:
    - If C ≤ 80, then the challenger is *matching*.
    - If C > 80, then the challenger is *opposed*.

- There is a 60% chance that the target is A:
    - If X ≤ 60, then the target is A.
    - If X > 60, then the target is B.

Note also that the values of T, C, and X are randomly and independently selected at the beginning of every round. That is, the values chosen in one round do not affect the values chosen in another round.

Politician Payoffs

The number of points that politicians receive in each round is the sum of two components.

The politician's policy component depends on the politician's type T, the target X, and the politician's policy choice.

If the politician's type is *matching*, then the politician receives **25 points for choosing a policy that matches the target** (i.e., policy A if the target is A or policy B if the target is B) and **0 points if they do not match**.

If the politician's type is *opposed*, then the politician receives **25 points for choosing a policy that is opposite of the target** (i.e., policy A if the target is B or policy B if the target is A) and **0 points if they match**.

The politician's election component depends on the voter's action. Politicians receive an additional **175 points if they are re-elected by the voter**. If the voter instead elects the challenger, then the politician receives points from only the policy component.

Voter Payoffs

The number of points that voters receive in each round is also the sum of a policy component and an election component.

In terms of the voter's policy component, the voter receives **100 points if the policy matches the target and 0 points if the policy and target do not match**. (Thus, voters' policy payoffs are similar to the matching politician type's.)

Appendix: Instructions for 25/175 Condition (political context)

The <u>voter's election component</u> depends on the type of politician or challenger that is elected. A voter earns **100 additional points for electing a matching type** (if a matching politician is re-elected *or* if a matching challenger is elected) and **0 additional points for electing an opposed type** (if an opposed politician is re-elected or if an opposed challenger is elected).

Instruction Questions

Before we begin the experiment, there will be a set of questions to ensure that everyone understands the instructions. **Your answers to these questions do not affect your earnings**, but please answer the questions as best you can. You may refer to your printed instructions as often as you like, and note that for your convenience, there is also a "quick reference" sheet. When you are finished with each set of questions, the computer will check your answers and you will receive feedback. We will begin the experiment when everyone has answered all of the questions.

If you have any further questions at this time, please raise your hand and the experimenter will come to you.

Quick Reference

Types and targets

- T, C, and X are independent and randomly selected whole numbers from 1 to 100. Every number from 1 to 100 is equally likely and is selected at the beginning of every round.

- Politician is *matching* if T ≤ 80, and *opposed* otherwise.

- Challenger is *matching* if C ≤ 80, and *opposed* otherwise.

- The target is A if X ≤ 60, and B otherwise.

Politicians

- Politicians observe the target.

- Matching politicians receive 25 points from matching the policy to the target.

- Opposed politicians receive 25 points if the policy and target do not match.

- Both types of politician receive an additional 175 points from being re-elected.

Voters

- Voters observe the politician's policy choice

- Voters do not observe the politician's type, the challenger's type, or the target.

- Voters receive 100 points if the policy matches the target.

- Voters receive an additional 100 points if type of politician elected is matching (re-electing the politician who is matching or electing a challenger who is matching).

Instructions for Part II

There are five rounds in Part II, and the rounds are divided into three sets. Each set of rounds involves a slightly different Rule for the decision task. **In addition to the rounds from Part I, 1 round from Part II will be randomly selected for payment at the end of the experiment.**

The different rules for Part II are as follows:

Rule 1: Politician chooses policy subject to re-election. The rules of this round are exactly the same as in Part I of the experiment. You will play one round with this rule as a politician and one round as a voter.

Rule 2: Politician chooses policy without facing re-election. In this round, the politician chooses policy but there is no challenger and no election (the voter does not take an action). The voter receives the same amount of points for the policy choice and the politician's type as in Part I. The politician also receives the same amount of points for the policy choice and in addition automatically receives 175 additional points (in lieu of facing re-election). Otherwise, the rules are the same as in Part I. You will play one round with this rule as a politician and one round as a voter.

Rule 3: Voter chooses policy directly. In this round, there are two targets (Target 1 and Target 2) and the voter chooses two policies directly (Policy 1 and Policy 2). Each target is selected independently, and the voter is paid for each policy that matches the corresponding target (100 points if Policy 1 matches Target 1 and 100 additional points if Policy 2 matches Target 2). You will not find out the values of the targets until the round is over.

Bonus points. Before you play any of the rounds, you will also choose one Rule to count for guaranteed bonus points. **More specifically, you will earn 5 times the number of points from the round for the Rule you choose in which you are a voter.** Your guaranteed bonus points will be added to the points you earn from the randomly selected rounds from Part I and Part II. (Note that this choice does not affect the round that will be randomly selected from Part II.)

Details for Instruction Quiz

Questions below are for the 25/175 Political Condition. The quiz was administered in z-tree before Part 1. Subjects were shown the correct answer and whether or not they answered correctly. The correct answer is underlined. Relative frequencies for each response are given in parentheses (N = 110, pooling subjects' responses for both political conditions).

1. If T is 90, what type is the politician?
   a. <u>Matching (87%)</u>
   b. Opposed (13%)

2. If C is 67, what type is the challenger?
   a. <u>Matching (87%)</u>
   b. Opposed (13%)

3. If X is 32, what is the target?
   a. <u>A (94%)</u>
   b. B (6%)

4. How many points does a MATCHING POLITICIAN earn from choosing policy B if the target is B?
   a. 0 (2%)
   b. <u>25 (98%)</u>
   c. 100 (0%)
   d. 175 (0%)
   e. 200 (0%)

5. How many points does the POLITICIAN earn from being re-elected by the voter?
   a. 0 (0%)
   b. 25 (0%)
   c. 100 (1%)
   d. <u>175 (98%)</u>
   e. 200 (1%)

6. If the target is B and the politician chooses A, how many points does the VOTER earn from the policy?
   a. <u>0 (94%)</u>
   b. 25 (1%)
   c. 100 (5%)
   d. 175 (0%)
   e. 200 (0%)

7. Suppose you are a MATCHING type politician, the target is B, you choose policy B, and you are NOT RE-ELECTED. How many points will you earn?

a. 0 (2%)
b. <u>25 (93%)</u>
c. 100 (4%)
d. 175 (0%)
e. 200 (1%)

8. Suppose you are an OPPOSED type politician, the target is A, you choose policy A, and you are RE-ELECTED, how many points will you earn?
a. 0 (7%)
b. 25 (3%)
c. 100 (2%)
d. <u>175 (60%)</u>
e. 200 (28%)

9. Suppose you are a VOTER, the target is A, the politician chooses A, and you elect an OPPOSED type challenger, how many points will you earn?
a. 0 (25%)
b. 25 (5%)
c. <u>100 (65%)</u>
d. 175 (1%)
e. 200 (4%)

10. What if you are a VOTER, the target is B, the politician chooses B, and you elect a MATCHING type challenger, how many points will you earn?
a. 0 (3%)
b. 25 (4%)
c. 100 (27%)
d. 175 (0%)
e. <u>200 (66%)</u>