Fact Finding Trips to Italy: An experimental investigation of voter incentives

Cortney S. Rodet

Florida State University

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-Abstract-

This paper addresses the interaction of voter information and seniority on electoral accountability. We test whether information leads voters to be less tolerant of moral hazard in a legislative system favoring seniority. A simple game theoretic model is used to predict outcomes in a pork-barrel experiment where subjects act as legislators and voters. Senior legislators have an advantage in providing transfers which presents the opportunity to shirk where legislators can enrich themselves at the expense of voters. Voter information about incumbent behavior is varied across experimental treatments. We find that accountability increases when voters can compare their own legislator's behavior to the behavior of others. Despite the fact that voters succumb to the incentives of seniority, information is effective in deterring legislator shirking.

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WORKING PAPER: PLEASE DO NOT CITE WITHOUT PERMISSION

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[2] Florida State University, Department of Economics, 113 Collegiate Loop, Room 263, PO Box 3062180, Tallahassee, FL 32306-2180. cortneyrodet@hotmail.com

1 Introduction

A voter's decision is influenced by the amount and type of information she has regarding a candidate. The amount of information a voter gathers is largely a result of relative costs and benefits. The type of information a voter obtains can range from a candidate's party and platform to their experience and seniority. Seniority in Congress creates an advantage in pork-barrel legislation through experience, networks and committee leadership (Plott 1968, Dick and Lott 1993, Friedman and Wittman 1995, Knight 2002, Bernhardt, Dubey and Hughson 2004, Chen and Niou 2005). It potentially creates a collective action problem where voters disregard unprincipled behavior of incumbents because of the implicit cost of foregone federal spending in their district or state i.e. pork (Dick and Lott 1993, Bernhardt et al. 2004).

For example, legislators' use of tax dollars has come under heavy scrutiny in the wake of the current recession. The Treasury Department reports that Congress has spent approximately $110.5 million since 2001 on foreign travel or "fact finding trips" to various places like Italy or the Great Barrier Reef in Australia (Singer 2010).[3] Overall, spending on overseas travel is up ten-fold since 1995 (Mullins and Farnam 2009). Bloated budgets for office décor and the exclusive VIP wing at Walter Reed hospital have also received attention (Sepp 2000, Zoroya 2007). Before the 2010 midterm elections growing anti-government sentiment led the House to take modest steps with regard to spending, but nothing has been done in the Senate. Yet reelection rates have averaged ninety-five percent in the U.S. House since 1972 (Friedman and Holden 2009), and many point to incumbents' ability to secure pork barrel benefits as one of the largest reasons why (Mayhew 1974, Levitt and Snyder 1997).

Re-election rates in the 2010 midterm election were 87% in the House and 84% in the Senate, but 75% of Gallup poll respondents disapproved of Congress (Saad 2011). Voters are not necessarily inconsistent if they approve of their own legislator while disapproving of the actions of the legislature as a whole, but these data may indicate voters' dissatisfaction with the inherent moral hazard problem in politics. On the other hand, it may simply signify that voters are uninformed.

[3] This does not include travel to war zones in Iraq and Afghanistan (Singer 2010).

This paper uses laboratory experiments to understand the interaction of seniority and voter information in a pork-barrel experiment where subjects act as legislators and voters. Different information treatments are used across a single structure where senior incumbents can provide large amounts of pork benefits to their voters but also have the ability to use their position to increase their own payoff at the expense of voters. The information treatments vary the amount, type and cost of information that district voters can obtain to test whether any of these variants are important in the decision to hold politicians accountable. Results suggest that voters predictably respond to the incentives created by seniority yet accountability increases when they are able to compare their incumbent's behavior to that of other incumbents. Legislators capitalize on their seniority advantage, but not to the extent predicted by the model. Their decisions to shirk are affected by the information treatments.

The next section provides motivation for the research project. Section 3 lays out a simple model used to make predictions tested in the laboratory. Section 4 details the experimental design and the hypotheses involved and the results are presented in Section 5. Section 6 concludes.

2 Seniority and Voter Information

Consider the principal-agent relationship between voters and elected officials. If a politician's effort that is observed by voters contains some element of randomness, thus deteriorating their performance signal, seniority acts to insure incumbents against bad outcomes and leads to moral hazard. The distributive theory of politics suggests that voters overlook such behavior because of a legislator's ability to secure pork-barrel spending (Stein and Bickers 1994, Alvarez and Saving 1997, Levitt and Snyder 1997, Gomez and Wilson 2001, Arceneaux 2006). Sacking a senior legislator is costly in terms of foregone pork.

Seniority plays a vital role in a legislator's ability to acquire pork as he or she gains experience, establishes networks and obtains leadership roles (Weingast and Marshall 1988). Experimental evidence has shown that seniority is important to voters when they face a tradeoff between monetary benefits and policy representation (Rodet 2011), so there is also reason to believe that it matters when a voter must choose between a legislator who "does the right thing" or one who is known for "feathering his own nest" (Stigler 1971).

The strategic implications of seniority were effectively modeled by McKelvey and Riezman (1992) where they showed that legislators have the incentive to institute seniority to prevent legislator turnover.[4] In theory, recurring competitive elections and promises of long-term employment would solve the principal-agent problem, but using tenure as an allocation mechanism for political benefits encourages the voter to lower her performance standard. Seniority is modeled similarly here as senior incumbents have an advantage in providing pork. The moral hazard problem central to the paper is framed as the opportunity for legislators to enjoy private benefits at the expense of voters, but the model can be applied to any legislator's effort decision that may adversely impact voters.

In addition to seniority, a central element upon which electoral accountability hinges is voter information. It is possible that shirking occurs because of the usual rational ignorance and collective action problems. Voters lack the incentive to become informed because of their infra-marginality and lack incentive to act even if they are informed because personal costs are low relative to system wide costs. Experiments are useful in that they allow control over this focal variable.

The experimental treatments vary the information that voters receive. In the baseline treatment voters do not receive any explicit information regarding the incumbent's choices, but they can infer what may have occurred through their own payoff each period. In the full information treatment, voters see the incumbent's choices and their resulting payoff. In the costly information treatment voters can only reveal this information by paying a small fee. This treatment creates a public good problem, but it may remedy the coordination problem voters face if revealing information signals a voter's willingness to punish excessive shirking. Without information it does not pay for a voter to react if he is uncertain other voters know or will react (Weingast 1997). Finally, in the full and relative information treatment voters are informed about their own incumbent's choices as well as those of the other senior incumbents in the game.

There is reason to believe that revealing information about their choices affects the behavior of elected officials. This impact on has been well documented (Besley and Burgess 2002; Djankov, McLiesh, Nenova, and Shleifer 2003; McMillan and Zoido 2004; Stromberg

[4] See also Holcombe (1989) and Muthoo and Shepsle (2010).

2004; Ferraz and Finan 2008).[5] For instance, Besley and Prat (2006) highlight the correlation between information and high incumbent turnover and low corruption emphasizing that information to the electorate is an essential component of accountability.[6]

3 The Model

In representative government the state must acquire the consent of voters to maintain tenure. If the state is made up of a single agent who acquires consent via promises of redistribution, he would garner sufficient consent by appropriating wealth from a minority and allocating it entirely to the opposing majority. In the case where the state is made up of many agents representing many more principals, the basic concept is the same, but allowing seniority to determine control within the state empowers senior representatives in the principal-agent relationship with their voters. In other words, the majority is not guaranteed to receive the full redistribution, nor does it require it in exchange for consent because it stands to be on the other end of the exchange by electing a challenger who lacks seniority. This arrangement decreases the cost of obtaining consent. The following model formally shows that equilibrium exists where representative agents enjoy full discretion because of seniority.

In the model there are D districts, each with N_{d}, $d = \{1, .., D\}$ voters and one incumbent legislator. Voters receive an endowment, E, each period, which is taxable. The incumbent from each district is either senior or junior based on the variable e_{dt} that measures his tenure. That is,

$$s_{dt} = \begin{Bmatrix} senior \ if \ e_{dt} \geq e_m \\ junior \ otherwise \end{Bmatrix},$$

where e_m is the median tenure among all incumbents. Legislators determine whether voters are taxed and seniority dictates how the tax revenue is distributed.[7] Senior incumbents decide

[5] Peru's ex-president Alberto Fujimori and his secret-police chief Vladimiro Montesinos Torres learned the hard way when the lone cable news channel that they did not bribe exposed the administration's infractions. Montesinos deemed the channel too small to be considered a threat. Bribery efforts were concentrated in the television industry rather than newspaper because only the upper class was exposed to newsprint. Thus "it was not the elite whom Montesinos feared, but the masses." (McMillan and Zoido 2004)
[6] For a review of the possible down side to supplying the principal full information see Prat (2005).
[7] This can be thought of as the structure-induced equilibrium resulting from committee proposal power achieved by seniority (Shepsle and Weingast 1981).

how much of the transfer is actually delivered to their voters as they have the option to take some or all of the voters' shares of the transfer. This is represented by g_{dt} and is assumed to be equal for all voters in the district. The period payoff for a voter i in district d is:

$$U_{idt} = E - \tau_t + \alpha_t \left(\frac{\sigma_{dt} \Pi_t}{N_d} - I\{s_t\} g_{dt} \right). \tag{1.1}$$

The term α_t is a random efficiency variable that affects the "quality" of the net transfer delivered to voters after the incumbent chooses g_{dt}. It is uniformly random on the range $[\underline{\alpha}, 1]$ with mean $\hat{\alpha} = (1 + \underline{\alpha})/2$ and variance, $v = (1 - \underline{\alpha})^2/12$.[8] Each period a new α_t is drawn that is unknown to incumbents when the choice g_{dt} is made; however, both voters and legislators know the distribution from which α_t is drawn. The choice g_{dt} is bound above by $\frac{\sigma_{dt} \Pi_t}{N_d}$. The parameter σ_{dt} is the district's share of the tax benefits where

$$\sigma_{dt} = \begin{Bmatrix} \frac{1}{S} \, if \; s_{dt} = senior \; in \; period \; t \\ 0 \; if \; s_{dt} = junior \end{Bmatrix},$$

and S is the number of legislators who are senior. Total tax revenue is represented by Π_t.[9] The tax is assumed to be equal across all districts as is the number of voters and therefore imply that $\Pi_t = \tau_t N_d D$. The function $I\{s_t\}$ equals 1 if the incumbent is senior. The period payoff for incumbent d is:

$$U_{dt} = W + I\{s_t\} g_{dt} * N_d. \tag{1.2}$$

The term W represents the legislator wage and perquisites guaranteed while in office. It is assumed that incumbents who lose reelection join an existing pool of legislators, $L - D$, earning a wage w and can be elected again in the future. It is assumed that $W > w$. Challengers are not specifically modeled as they are integral only by their existence. It is assumed only senior incumbents choose g_{dt}.

For simplicity, the game is assumed to be finite with T periods. The tax is simplified to be a binary decision where legislators vote either 'yes' or 'no' on taxing voters an amount equal to their endowment. Given the seniority structure, it is assumed throughout the rest of model that voters are always taxed such that the period payoff for a voter in a senior district is

[8] Assuming a uniform distribution does not affect the conclusions; however, this is what was used in the experiments.

[9] This is a simplification and not an argument that junior legislators cannot provide pork spending for their districts.

$$U_{idt}^{s} = \alpha_t \left(B - g_{dt}\right), \tag{1.3}$$

where $B = \frac{\sigma_{dt}\Pi_t}{N_d}$. The period payoff for a voter in a junior district is

$$U_{idt}^{j} = 0. \tag{1.4}$$

The continuation payoffs for voters in senior and junior districts are respectively found in (3.5) and (3.6)

$$V_{idt}^{s} = max_c \; \alpha_t \left(B - g_{dt}\right) + \gamma_t \left[I\{I\}\left(\alpha_{t+1}\left(B - g_{dt+1}\right)\right) + I\{C\}(0)\right] \tag{1.5}$$

$$V_{idt}^{j} = max_{c_t} \; 0 + \gamma_t \left[I\{I\}\left(p_{idt+1}\left(\alpha_{t+1}\left(B - g_{dt+1}\right)\right) + (1 - p_{idt+1})(0)\right) + I\{C\}(0)\right]. \tag{1.6}$$

The variable $c_t = \{I, C\}$ is the voter's choice of either the incumbent or challenger where $I\{I\} = 1$ if the voter chooses the incumbent and $I\{C\} = 1$ if the voter chooses the challenger. The voter's belief that the junior legislator will become senior in the next period if he is reelected is p_{idt+1}. This is equivalent to believing that a senior incumbent as well as the junior incumbents ranked ahead of the legislator from district d will all lose reelection.

The continuation payoffs for senior and junior incumbents are found in (1.7) and (1.8):

$$V_{dt}^{s} = W + g_{dt} * N_d + \gamma_t[q_{dt+1}(W + g_{dt+1} * N_d) + (1 - q_{dt+1})w] \tag{1.7}$$

$$V_{dt}^{j} = W + \gamma_t \left[q_{dt+1}\left(p_{dt+1}\left(W + g_{dt+1} * N_d\right)\right) + (1 - p_{dt+1})W\right) + (1 - q_{dt+1})w]. \tag{1.8}$$

The term q_{dt+1} is the incumbent's belief about reelection. Junior incumbents hold the same belief about becoming senior as their district voters.

In of the first stage of each period the senior legislators choose g_{dt}. In the second stage voters choose whether to keep the incumbent or elect a challenger. There is no campaigning so challengers do not assume an active role within the model, but the existence of an alternative to the status quo is sufficient to incentivize incumbents. The game is played under a condition of common knowledge such that legislators and voters understand each others' incentives. Allowing voters to use weakly dominant strategies results in the following equilibrium:

Proposition 1:

The stationary sub-game perfect equilibrium involves probabilities $\boldsymbol{p} = 0$ for all voters and legislators and $\boldsymbol{q} = 1$ for all legislators, such that incumbents are reelected every period. Senior incumbents choose g_{dt} such that the voters' payoff is zero i.e. $g_{dt} = B$.

A sketch of a proof provides the intuition about equilibrium. Voters reelect senior and junior incumbents, as they are indifferent between receiving zero from an opportunistic senior incumbent or a junior incumbent without sway in the legislature. Senior incumbents maximize their payoff (or minimize their effort) as a smaller g_{dt} leaves money on the table. According to the model the only information relevant to voters is seniority[10], but there is reason to believe that the revelation of legislators' decisions will impact voters' choices by attributing outcomes either to nature or to the conscious decision of the agent.

4 Experimental Design

The following are basic elements to the experimental design. Subjects will be referred to as either voters or legislators but context was not used in the experiment. The reader can find the instructions in the appendix. The parameters were chosen to be consistent with the pork-barrel experiment used in Rodet (2011). The general set up was ten legislators and five districts with three voters each ($L = 10, D = 5,$, and $N_d = 3$). Only five legislators were in office at one time and are referred to as being "active." The other five are considered "inactive." Of the five active legislators, the top three in terms of tenure were considered senior. The tenure rank of the active legislators was randomly determined to begin the experiment. In total twenty-five subjects were needed per session.

Active legislators received a salary of sixty cents each period, and inactive legislators decoded text strings for 2.5 cents for every correct code. The decoding activity was provided to keep subjects involved as well as give them a means of earning some money if the prediction of zero legislator-turnover held up. Voters received an endowment of forty-five cents each period which was subject to taxation. Voters were taxed an amount equal to their endowment if the active legislators passed the tax. Only voters in senior districts stood to

[10] Seniority is not only related to pork, but recognition and experience as well.

receive a positive share of the tax revenue and could receive as much as seventy-five cents in a single period. This means voters in junior districts were left with nothing if the tax passed.

The efficiency variable α_t varied between [1/3, 1] each period. The lower bound of 1/3 was chosen so that the ex-ante expected value of the transfer to senior district voters was fifty cents. This was intended to be greater than the endowment so senior district voters would prefer that the tax passed but would still allow senior incumbents to disguise their actions in the no-information treatment. The random draw each period was the same for each treatment and session. The legislators did not know the value of α_t when making their decisions, but all subjects knew the distribution from which the efficiency variable was drawn.

Each session featured twenty paying periods. The first five periods functioned as a control where legislators set taxes by simple majority rule. Groups were then randomized and the next 15 periods allowed for legislator shirking. Subjects were thoroughly instructed on the payoff structures and were told that the maximum amount a legislator could take per voter was seventy-five cents whereas the minimum was zero. Legislators and voters also had access to a calculator at the beginning of each period that allowed them to test different levels of efficiency as well as legislator shirking.

4.1 Treatments

Each period of the experiment had two stages. In the first stage the active legislators made their choices and in the second stage voters decided whether to keep the incumbent legislator based on the information they were given. Stage 1 did not vary across treatments, but Stage 2 varied by the information voters received. While the model's predictions rule out information influencing voter decisions, behavioral considerations as to whether voters respond differently to outcomes of chance and outcomes of strategy are important. In the baseline treatment voters are only informed of the resulting payoff each period and have no knowledge of the incumbent's choices. Voters in the other treatments are either given varying degrees of information at varying prices.

4.1.1 No Information Treatment: In Stage 1 active legislators voted on the tax and each senior incumbent indicated how much of the voters' transfers they would keep if the tax passed. In Stage 2 of this treatment voters saw their payoffs, but they did not see the value of α_t, the legislator's vote, or how much of the transfer the incumbent decided to keep. They voted on whether to keep the incumbent or not. Legislators saw their own payoffs, the value of α_t and their voters' payoffs. Election results were announced within each district. They were also informed of what the legislator's seniority rank would be in the upcoming period, whether he or she was a returning incumbent or a newly elected challenger.

4.1.2 Full Information Treatment: In this treatment voters saw their legislator's tax vote, the value of α_t and their payoffs. If the incumbent was senior the voter also saw how much the transfer he or she awarded themselves. A vote was then taken to determine the fate of the incumbent.

4.1.3 Costly Information Treatment: Here voters saw their payoffs, but did not see the value of α_t, the legislator's tax vote, or how much of the transfer was kept by the incumbent if he or she was senior. They had the option of paying five cents to reveal information to the group about the legislator's decisions and the efficiency variable.[11]

4.1.4 Relative Information Treatment: This treatment differed from the Full Information case because voters not only saw the amount taken by their own senior incumbent, but all voters saw the amounts taken by all senior incumbents. Incumbents remained unaware of the amounts taken by the others.

4.2 Hypotheses

We now arrive at the predicted legislator and voter behavior.

Hypothesis 1: Voters will always be taxed, given the senior minimum winning majority in the legislature.

Hypothesis 2: Senior legislators take the largest amount possible from voters' transfers (seventy-five cents per voter).

Hypothesis 3: Incumbents will always be reelected. The marginal voter cannot do any better by electing the challenger based on seniority rule.

Hypothesis 4: Information will not matter.

Hypothesis 5: No voter will pay to reveal information in the Costly Information Treatment.

[11] All voters had the option of paying the fee to reveal information, even those with a period payoff of zero. The bankruptcy rule instituted guaranteed that subjects leave with at least their participation fee of $10.

The hypotheses are stark and point to a possible weakness in the theoretical model. The role of information is absent from the model but it is the main experimental treatment. This is because there are important behavioral factors to consider including voters' visceral reaction to discovering their payoff is not a result of nature but the choice of an elected individual who increases their own payoff at the voters' expense. We know that behavior in the simple ultimatum game, of which the pork-barrel game is arguably an elaborate extension, does not align with theory. The Full Information treatment provides a direct comparison to the No Information treatment where any variation in behavior can be linked to the ability to directly attribute outcomes to legislators' choices. The Costly Information treatment provides a rough measure of the willingness of voters to use information that is not given freely. The final hypothesis constitutes a true display of rational ignorance elucidated by Downs (1957) where voters free ride on others' willingness to supply information. As he put it, "when benefits are indivisible, each individual is always motivated to evade his share of the cost of producing them." The Relative Information treatment adds another wrinkle to the Full Information treatment that may affect a voter's behavioral response by allowing them to compare their own incumbent's behavior to others'. It is also likely that any difference in voter behavior will cause a reaction in legislator behavior because this is a repeated game.

5 Results

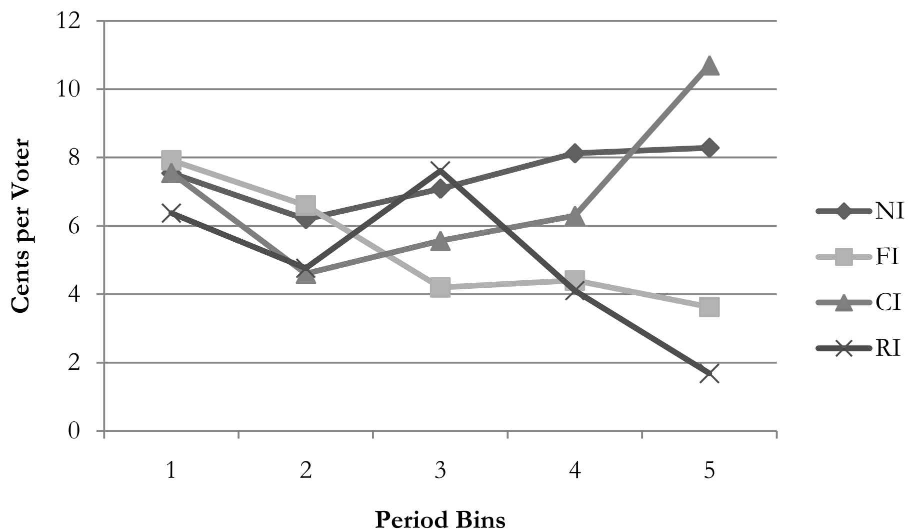
This section describes the results from the eight sessions ran at the XSFS lab at the Florida State University. The amount taken from the voters' transfers by the subject legislators will be referred to as their "take." Subjects were recruited using the ORSEE online recruiting software (Greiner 2004). Two sessions of each treatment were run using twenty-five subjects each. This led to two-hundred subjects in all. The average payment was around $18 including a $10 participation fee for an hour in the lab. The aggregate results will follow the order of the hypotheses, followed by regression analysis of voter choice.

5.1 Taxes

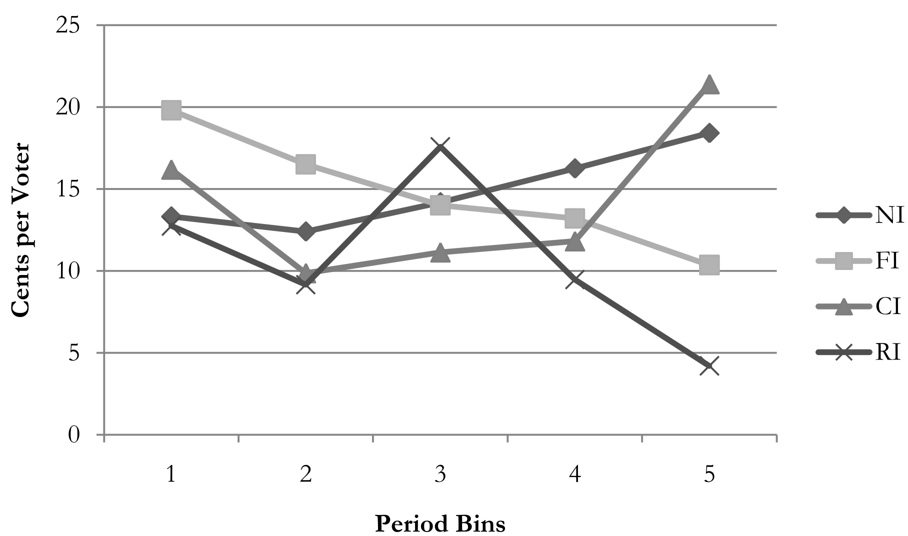
Voters were taxed virtually every period of each treatment as predicted. The legislators in the no-information (NI), full-information (FI), costly-information (CI) and relative information (RI) treatments passed the tax one-hundred percent, ninety-seven percent, one-hundred and ninety-seven percent of the time respectively.

Result 1 (Hypothesis 1): Legislators pass the redistributive tax nearly one-hundred percent of the time in every treatment.

5.2 Excessive Taking



Panel A: Mean by period bin when tax passes



Panel B: Mean conditional on being positive
Figure 1: Mean Legislator Take

Figure 1 shows the mean legislator take by treatment and by period bin. Each bin consists of three periods except for the fifth bin where the last period is excluded from the analysis. Right away it is apparent that senior legislators did not behave as predicted and took well below the maximum of seventy-five cents per subject. Panel A includes the instances where senior legislators chose to take nothing whereas Panel B shows the means conditional on being greater than zero. Simple indications that legislators were strategically concerned with voters' responses are the last period jumps, which are not included in the figure. Initially there is not much difference between treatments, but the differences between the RI treatment and every other treatment in the fifth bin are statistically significant in both Panels A and B. Moreover, except for the third bin, the average take in the RI treatment appears to be less than the mean in every other treatment.

Table 1: Mean Take by Treatment

Treatment	**Mean**	**Conditional Mean**	**Frequency**	**Percent***
No Information	12.31 (1.99)	14.57 (2.27)	71	85%
Full Information	8.97[a] (1.41)	15.14 (1.93)	48	59%[c]
Costly Information	11.13 (1.64)	13.55 (1.87)	69	82%
Relative Information	8.58[b] (1.83)	11.21 (2.29)	62	77%

a: Significantly different than NI Treatment (t-stat 1.36 p-value 0.09); b: Significantly different than NI Treatment (t-stat 1.37 p-value 0.09); c: Significantly lower than NI, CI and RI treatments (t-stats 2.78, 2.54 and 1.71; p-values 0.00, 0.01, 0.04); Numbers in parentheses are standard errors. * The overall mean is conditional on the tax passing which happened 84 out of 84 times (100%) in the NI Treatment, 81 out of 84 times (97 %) in the FI Treatment, 84 out of 84 times (100%) in the CI treatment, and 81 out of 84 times (97%) in the RI Treatment.

Table 1 shows similar results aggregated over all period except the final one.[12] Comparing the overall means reveals that the average take was smaller in both the FI and RI

[12] The mean is taken for only those periods that the tax passed.

treatments when compared to the NI case (t-stat 1.36 p-value 0.09 and t-stat 1.37 p-value 0.09 for FI and RI respectively). This suggests legislators reacted to the information treatments; however these differences disappear when looking at the conditional means. This implies that fewer legislators were inclined to take positive amounts in the FI and RI treatment.[13]

Looking at the percentage of times a legislator took a positive amount gives the impression that the information unquestionably mattered to the subject legislators. In the FI treatment legislators only took a positive amount fifty-nine percent of the time, whereas in the NI, CI and RI treatments it was eighty-five, eighty-two and seventy-seven percent of the time respectively. Tests reveal that the percentage in the FI treatment is statistically less than all other treatments (t-stat 2.78 p-value 0.00, t-stat 2.54 p-value 0.01 and t-stat 1.71 and p-value 0.04 for the NI, CI and RI treatments respectively), but there is no difference between the RI treatment and the NI and CI treatments (respective t-stat 1.07 p-value 0.14 and t-stat 0.84 p-value 0.20).[14] We might interpret this to mean that legislators in the FI and RI treatments were both affected by information but in different ways. Legislators in the FI treatment were less likely to take anything, but those that did took amounts of similar magnitudes. The frequency in the RI treatment was the same rate as in the NI and CI treatments, but they were concerned about being the legislator taking the largest amount.

Result 2 (Hypothesis 2): Senior incumbents do not maximize their take in any of the information treatments. Moreover, when information was freely available to voters (FI and RI treatments) the mean take was significantly lower than when information was not freely available (NI and CI treatments). Legislators took positive amounts less frequently in the FI treatment than any other treatment.

Figure 2 tracks the mean take by experience bins and by treatments. The bins are divided by three periods such that the first bin shows the average amount taken by incumbents with one to three periods of experience and so on. Experience measures their overall time spent as an active legislator and not necessarily their tenure in their current

[13] Notice that the mean take conditional on being positive is slightly higher in the FI treatment, which is counterintuitive. It is important to remember that the subject legislators did not know the value of the efficiency variable prior to making their decisions, so the means may differ according to the risk profiles of the subjects in each treatment.
[14] All of these results exclude the last period, but including it does not change anything.

district. Interpreting these results is challenging because few people actually make it to the fifth bin. For example, in the RI treatment only three subjects are included in the fifth bin despite high reelection rates. One might expect that inexperienced legislators start low and increase the amount taken as they start to learn what is acceptable to voters leading to an upward trend. The opposite is also possible if legislators only reach the fourth or fifth bin by taking small amounts. Of course, each district may obey a particular norm, so it is not obvious that there should be any recognizable trend within or between treatments.

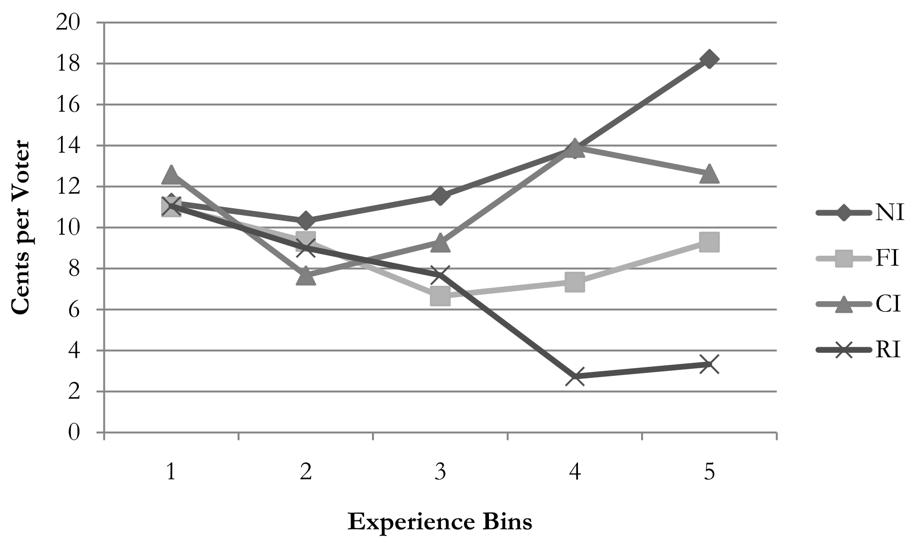


Figure 2: Mean Legislator Take by Experience Bins

According to the figure, there are slight upward trends in both the NI and CI treatments, which are arguably the treatments where we might expect to see legislators "testing the water" and gradually becoming more daring knowing that voters are uninformed. This would imply that shirking becomes worse as incumbents gain experience when information is not freely available, but the differences between bins are not statistically significant and shirking never reaches the level predicted. The average take stays relatively level as incumbents become more experienced in the FI treatment. This might indicate that incumbents were able to find a relatively stable level where they could enrich themselves and remain in office even when voters were fully informed. There appears to be a downward trend in the RI treatment where voters not only saw their own legislator's take but those of other senior incumbents as well. The difference between the first and fourth bins in this treatment is significant (t-stat 1.36 p-value 0.09). The difference between the first and fifth bins looks as though it should be significant, but this cannot be concluded given the small numbers problem. Analysis of reelection rates may shed more light on this. Although the graph does not paint a conclusive picture, regression analysis controlling for subject and group identity as well as treatment concludes that there is an overall upward trend as tenure increases.[15]

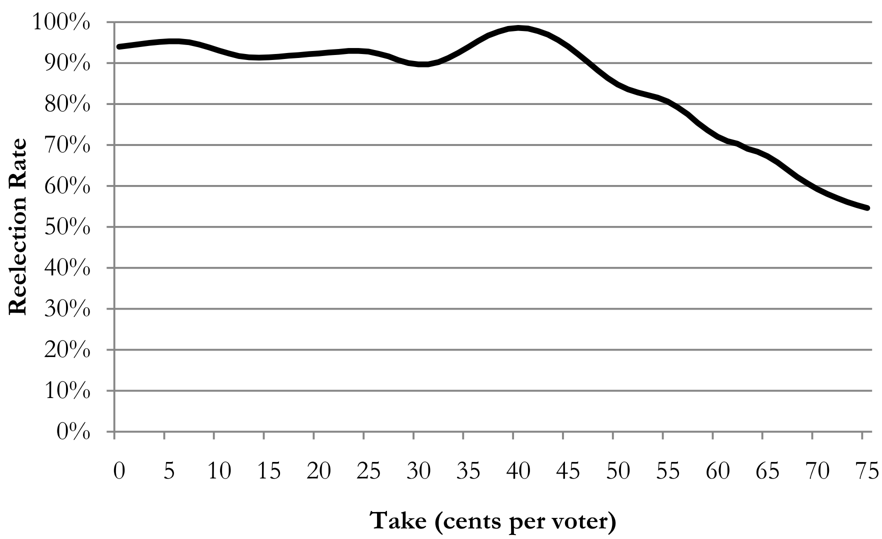


Figure 3: Estimated Probability of Reelection as a Function of Shirking

Reelection results will be discussed in depth below, but in reference to legislator shirking Figure 3 displays the kernel density estimation of the probability of reelection as a function of shirking measured as cents taken per voter. The data include all sessions and treatments to allow for more variation in the level of taking. The probability maximizing

[15] Random effects regression where *take* is measured in cents per voter:
$take_{jdt} = \underset{(2.50)}{2.83} + \underset{(0.15)}{0.86} tenure_{jdt} - \underset{(1.68)}{1.09} FI - \underset{(1.61)}{0.85} CI + \underset{(1.65)}{1.27} RI - \underset{(2.82)}{4.35} efficiency_{t-1} + \underset{(0.05)}{0.57} take_{jdt-1}; n = 517$. Care must be taken in attributing any trend to experience simply because an increase in experience is correlated with a decrease in the long-term value of staying in office. We might therefore expect increased shirking because the value of staying in office falls as subjects reach the end of the game.

level of taking was 41 cents, but for all practical purposes legislators were almost guaranteed reelection if they took 45 cents per voter or less. Expected utility estimates suggest that the expected utility maximizing level of taking was in fact 75 cents per voter.[16] The average level of taking in every treatment was well below this, meaning that subject legislators could have shirked to a much greater degree. Combining this with the reelection results below might lead us to infer that it was the threat of losing reelection that restrained legislators and not the voters' actual reactions to shirking.

5.3 Reelection

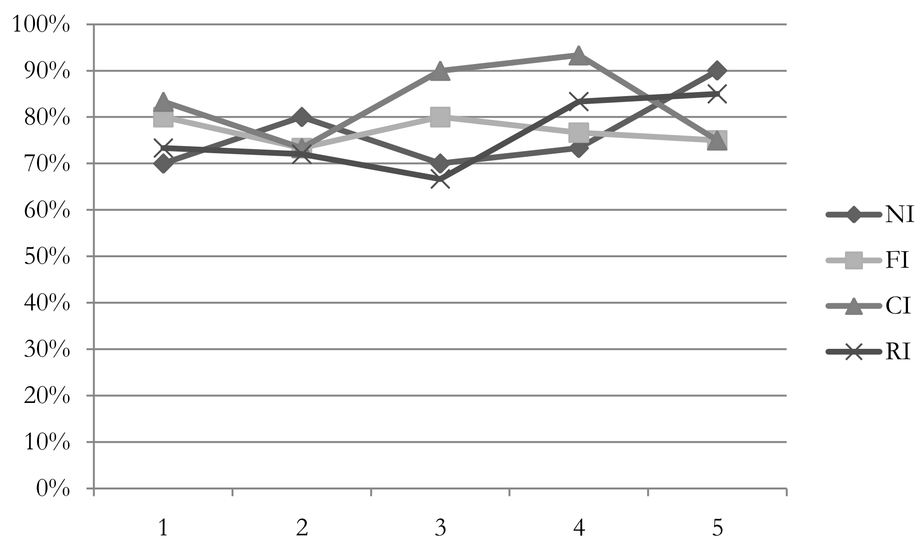
Figure 4 shows the mean reelection rates of incumbent legislators by treatment and by period bins. The data presented in Panel A includes all incumbents whereas Panel B includes only senior incumbents who took positive amounts from voters.

In general, reelection rates were not one-hundred percent in any treatment. Looking at the reelection rates of shirking senior incumbents tells us that voters recognized the incentives created by the seniority rule. Averages push up against one-hundred percent most of the time except in the initial periods of the RI treatment. In the later periods of this treatment reelection rates for shirking senior incumbents continue at one-hundred percent, but this coincides with a drop in the average take seen in Figure 1. One might expect that reelection rates would be relatively higher in the NI treatment where voters could only guess whether it was nature or the incumbent who reduced their payoffs. In fact, the reelection rate falls below one-hundred percent in only two periods of the NI treatment. It would appear when comparing the NI and the RI treatment that providing full and relative information to voters changes the overall reelection rates of incumbents, but the differences at this level are not statistically significant.

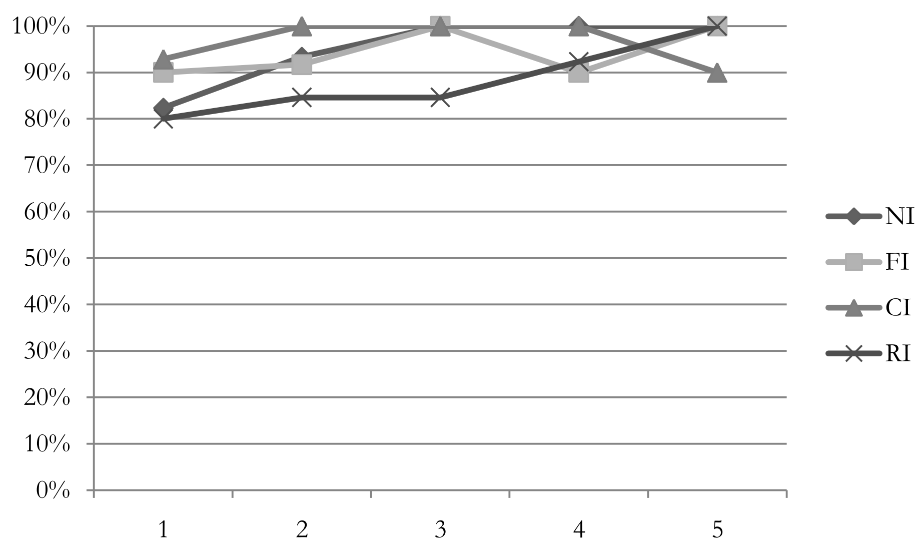
Table 2 shows that the averages over all periods reveal important differences when looking at senior incumbents who took a positive amount from voters. The mean reelection rates of these incumbents were ninety-four, ninety-three, ninety-seven and eighty-seven percent respectively for the NI, FI, CI and RI treatments. The reelection rate of senior incumbents taking a positive amount in the RI treatment is significantly lower than related

[16] Let *x* be the amount taken per voter. The expected utility was estimated as $3x+p_x(0.60)$ where p_x is the probability of reelection when taking *x*. There are three voters per district and the salary for active legislators was $0.60.

rates in the NI and CI treatments (t-stat 1.46 p-value 0.07 and t-stat 2.17 p-value 0.02 respectively). This is remarkable given that the average take and frequency were not different between these treatments. The reelection rates of senior incumbents who did not take a positive amount were one-hundred, ninety-seven, one-hundred and ninety-seven percent for the NI, FI, CI and RI treatments respectively.



Panel A: Overall Reelection



Panel B: Reelection of Shirking Incumbents
Figure 4: Reelection Rates by Treatment

Differences within treatments would be key indicators that voters cared about excessive taking, but clearly these differences are not significant for the NI, FI and CI treatments (t-stat 0.87 p-value 0.19, t-stat 0.73 p-value 0.23, and t-stat 0.66 p-value 0.26 respectively). The difference is significant for the RI treatment (t-stat 1.79 p-value 0.04). Together these differences suggest that relative information is critical for electoral accountability.

Table 2: Reelection Rates by Treatment

Treatment	**Junior**	**Senior Take > 0**	**Senior Take = 0**
No Information	46% (0.07) n = 56	94% (0.03) n = 71	100% n = 17
Full Information	52% (0.07) n=56	93% (0.04) n = 48	97% (0.03) n = 36
Costly Information	63%[a] (0.07) n = 56	97% (0.02) n = 69	100% n = 15
Relative Information	55%[b] (0.07) n=56	87%[c,d] (0.04) n=62	100%[e] n=22

a: Significantly greater than NI Treatment (t-stat 1.63 p-value 0.05); b: Significantly less than CI Treatment (t-stat 1.49 p-value 0.06); c: Significantly less than NI Treatment (t-stat 1.46 p-value 0.07); d: Significantly less than CI Treatment (t-stat 2.17 p-value 0.02); e: Significantly greater than RI Treatment with take>0 (t-stat 1.79 p-value 0.04); The last period of each treatment is excluded.

Result 3 (Hypotheses 3 and 4): Only senior incumbents who do not shirk are reelected nearly one-hundred percent of the time in all treatments; however, shirking senior incumbents are reelected at extremely high rates. The reelection rate of shirking senior incumbents when full and relative information is given to voters (RI treatment) is significantly lower than when information is not free (NI and CI treatments) or when voters only see their own incumbent's choices (FI treatment). It is also significantly lower than non-shirking senior incumbents in the same information treatment.

Looking at the overall reelection rate does not tell us how individuals voted and whether particular individuals consistently voted against a shirking incumbent. Table 3 shows the average rates of voting for a senior incumbent by treatment as well as the average rates of voting for a shirking senior incumbent. The percentage of times an individual voted for the incumbent when he or she was senior was found for each voter and averaged by treatment. This was also done for the instances when voters had a senior incumbent who took a positive amount from voters. For example, an individual voter in the NI treatment voted for a senior incumbent eighty-six percent of the time on average. In the same treatment a voter voted for a shirking senior incumbent eighty-percent of the time on average.

Table 3: Rate of Voting for Senior Incumbent by Treatment

Treatment	Overall	Senior Take > 0
No Information	86% (0.04) n = 18	80%[a] (0.05) n = 18
Full Information	94% (0.02) n=18	82%[b] (0.08) n = 18
Costly Information	90% (0.04) n = 15	90% (0.04) n = 15
Relative Information	85% (0.05) n=18	84%[c] (0.06) n=18

a: Significantly lower than overall rate (t-stat 1.71 p-value 0.05); b: significantly lower than overall rate (t-stat 1.77 p-value 0.05); c: significantly lower than overall rate (t-stat 2.06 p-value 0.03)

Differences in the NI, FI and RI treatments are significant, though the averages remain high (t-stat 1.71 p-value 0.05, t-stat 1.77 p-value 0.05, and t-stat 2.06 p-value 0.03 respectively). This suggests that some voters responded to shirking despite the fact that reelection rates of shirking incumbents were not significantly lower except for in the RI treatment. This reflects the classic collective action problem of changing the status quo. We must be cautious in interpreting these results because they lack controls for various factors. Moreover, all voters are included in these figures including those voters that may have had a senior incumbent only once. This is why a more careful econometric analysis is done, but first the propensity to purchase information must be addressed.

5.4 Paying for Information

Subjects infrequently paid to reveal information as was predicted. Figure 5 shows a histogram of the total number of times a subject paid to reveal information. The mode occurs at zero whereas the average is 1.4 times per subject in the CI treatment. Eleven of the eighteen subjects that did pay to reveal information did so only once. There was one subject who paid for information every period. A voter was significantly more likely to pay for information following a negative change in his or her period payoff. A decrease of ten cents from one period to the next increased the likelihood a voter purchases information by three percent (p-value 0.00) when controlling for period and legislator rank. This is consistent with experimental work by Colliers, Ordeshook and Williams (1989) investigating rational ignorance, but it is not economically significant.

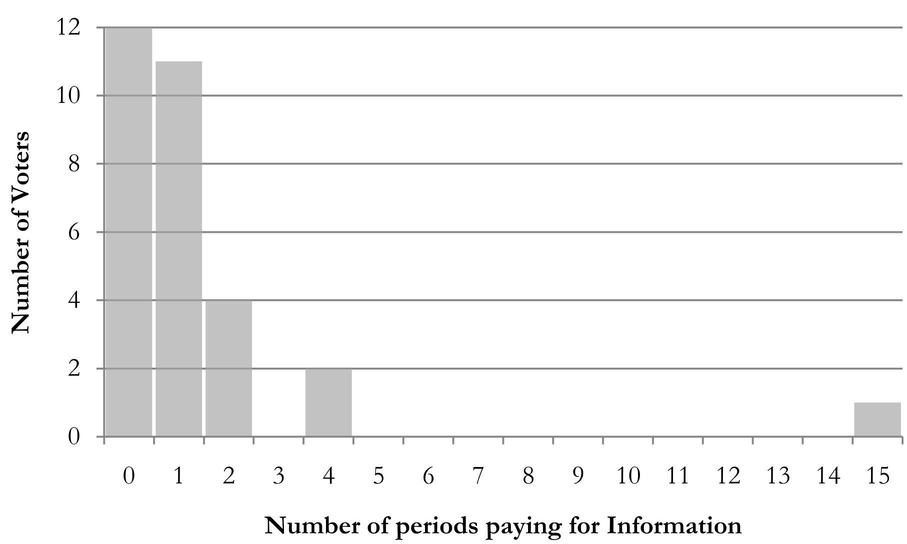


Figure 5: Paying for Information

It is not clear that subjects were free riding because it does not appear that voters used the information in the FI treatment. If voters could reveal the incumbents relative shirking like in the RI treatments, they may have revealed information more frequently. It appears that the value of information was overridden by the seniority incentives reflected by the fact that incumbents were reelected in virtually every period in both the FI and NI treatments. We can use the results in Table 1 to get a sense of this. On average, the availability of free information made senior voters better off between roughly two and two and a half cents when comparing the FI and RI treatments to the CI treatment. The fact that information cost five cents implies that voters were rational in not purchasing information.

Result 4 (Hypothesis 5): Voters use full and relative information when it is given to them (RI treatment), but they seldom pay to reveal information (CI treatment).

5.5 Econometric Analysis

The main goal of the econometric analysis is to investigate voter choice. The model is found in (1.9), where the dependent variable is the probability of voting for the incumbent. The objective is to explain the decision to vote for a shirking incumbent, so the model pertains only to voters with a senior incumbent and the instances where the tax passed. Certainly a more general model can be derived, but this parsimonious model serves well. The decision is a function of their payoff for that period, which is in turn a function of the amount the legislator took from voter's transfer share $(take_{dt})$ as well as the efficiency variable, α_t. The voter's payoff is not incorporated directly because including all three variables would create a co-linearity problem. The vector T includes treatment variables indicating the FI, CI and RI treatments and their interactions with $take_{dt}$. Note that the reference group is the NI treatment. The final terms are individual and district specific factors.

$$v_{idt} = \beta_1 + \beta_2 take_{dt} + \beta_3 efficiency_t + \gamma T + \epsilon_{idt} + u_{dt} \quad (1.9)$$

Two concerns about estimating this model arise immediately. First is the high probability of serially correlated error terms. This is easily taken care of using clustered standard errors. Second, and perhaps less obvious, is the possibility of correlation between the $take_{dt}$ variable with the district specific error term. This endogeneity stems from factors relating to the district's legislator. Consider the model in (1.10) which is the incumbent's decision of how much to take from voters. It is a function of three main variables: the legislator's tenure with the current district, $tenure_{dt}$, his take last period, $take_{dt-1}$, and the level of efficiency last period, $efficiency_{t-1}$. The first variable implies that a high tenure type is likely to take larger amounts, hence the concern for endogeneity in (1.9). Remember that this variable was found to be highly significant in a simple estimation of (1.10). The legislator's current decision may also be affected by the efficiency last period. Despite the independent draws of α_t, the legislator may decide to take more this period believing that he will have more room to shirk if efficiency was high last period. On the other hand, if efficiency was low last period, he may be more cautious in how much he takes from the public account. The decision is also affected by the information treatment as well as an idiosyncratic factor.

$$take_{dt} = \delta_1 + \delta_2 tenure_{dt} + \delta_3 take_{dt-1} + \delta_4 efficiency_{t-1} + \zeta T + \varphi_{jt} \tag{1.10}$$

These factors can be controlled for by including the right hand side variables in (1.10) within (1.9). This leads to the specification of the estimated model in (1.11).

$$v_{idt} = \lambda_1 + \lambda_2 take_{dt} + \lambda_3 take_{jdt-1} + \lambda_4 efficiency_t + \lambda_5 efficiency_{t-1} + \lambda_6 tenure_{jdt} + \gamma T + \omega_{idt} \tag{1.11}$$

The results in Table 4 are the marginal effects from two specifications using pooled logit estimation with robust standard errors clustered at the group level. The pooled logit estimator is the partial MLE and is consistent and asymptotically normal without the restrictive assumptions that random effects estimation places on the error terms; however, robust inference must be used to control individual serial correlation and correlation within groups. The first specification uses the log of the amount the incumbent took in cents along with treatment interaction terms. The other specification uses binary variables indicating whether the legislator took an amount greater than or equal to the median of five cents per voter. This was inspired by a noticeable regularity in the data where reelection rates were dramatically lower in the RI treatment when the incumbent took an amount greater than the median. The two constructs of the *take* variables are meant to display the robustness of the results. NI treatment voters are the reference group in all specifications.

Table 4: Pooled Logit

Dependent Variable: Probability of Voting for Incumbent

Independent Variables	**1**	**2**
FI	0.10	0.03
	(0.07)	(0.09)
CI	0.04	-0.04
	(0.05)	(0.05)
RI	0.10***	0.04
	(0.03)	(0.04)
Log Take	-0.03	
	(0.02)	
FI*Log Take	-0.05	
	(0.04)	
CI*Log Take	0.01	
	(0.03)	
RI*Log Take	-0.06***	
	(0.02)	
Log Take Lag	-0.00	
	(0.01)	
Take>Median		-0.09**
		(0.04)
FI* Take>Median		-0.01
		(0.11)
CI* Take>Median		0.10***
		(0.03)
RI* Take>Median		-0.22***
		(0.07)
Take>Median Lag		-0.03
		(0.02)
Efficiency	0.18**	0.16**
	(0.05)	(0.07)
Efficiency Lag	0.06	0.06
	(0.05)	(0.05)
Tenure	0.01**	0.01*
	(0.00)	(0.00)
Observations/Groups	988/96	988/96
Log Likelihood	-353.66	-384.33

(***), (**) and (*) indicate p-values < 0.01, 0.05 and 0.10 respectively. Random effects are at the subject level. Pooled Logit standard errors are clustered at the group level. Numbers in parentheses are robust standard errors. Periods 1 through 19 used in reported results. Including the last period does lead to significant differences.

Table 4 cont.:

Dependent Variable: Probability of Voting for Incumbent

Independent Variables	**3**
FI	0.06 (0.04)
CI	0.06 (0.04)
RI	0.06* (0.03)
Log Take	-0.05*** (0.01)
Log Take Lag	0.00 (0.01)
Max Take	0.04 (0.05)
FI * Max Take	-0.10 (0.12)
CI * Max Take	0.01 (0.08)
RI * Max Take	-0.22* (0.12)
Efficiency	0.16** (0.08)
Efficiency Lag	0.06 (0.05)
Tenure	0.01** (0.00)
Observations	988
Log Likelihood	-355.92

(***), (**) and (*) indicate p-values < 0.01, 0.05 and 0.10 respectively. Random effects are at the subject level. Pooled Logit standard errors are clustered at the group level. Numbers in parentheses are robust standard errors. Periods 1 through 19 used in reported results. Including the last period does lead to significant differences.

The first specification suggests that a voter in the RI treatment was more likely on average to vote for a non-shirking incumbent indicated by the positive and significant marginal effect of the RI treatment dummy. Moreover, voters in this treatment responded to taking and were significantly less likely to vote for a shirking incumbent evidenced by the negative and significant marginal effects on the *take* variables and the interactions with the RI treatment dummies in both specifications. The second specification provides an easy interpretation to the result. The average voter in the RI treatment was twenty-seven percent less likely to vote for an incumbent that took an amount greater than the median.[18]

There is little to say about the comparison of the FI treatment to the baseline. There is only a small and significant difference at small amounts of taking (the natural log of the median amount of five cents is 1.61). Predicted probabilities of voting for the incumbent in the CI treatment are significantly greater than the baseline even as the amount taken from voters increases. Despite having access to costly information, voters in this treatment were marginally more informed about incumbents' choices because few voters purchased information, therefore explaining this difference is a challenge. However, the difference is consistent with the result in specification 2 in Table 4 indicated by the positive and significant marginal effect on the CI interaction term.

The key result involving the RI treatment is confirmed in the bottom panel of Figure 6 where we can see a clear difference in voting for the incumbent who takes increasingly large amounts from voters. At the maximum possible value of seventy-five cents per voter (log(75) = 4.32), there was a 75% chance on average that a subject would vote for the incumbent. This number is barely 50% in the RI treatment.

In order to test whether voters in this treatment were in fact comparing the behavior incumbents, a third regression was estimated that includes indicators for whether the voters' incumbent took the largest amount relative to the other senior incumbents while holding the absolute amount taken fixed. The voters in the NI, FI and CI treatments did not have this information, therefore the indicator variable should only be significant in the RI case. The third column of Table 4 contains the marginal effects from pooled logit estimation with clustered standard errors using data from all treatments. The results show that after controlling for the amount taken by the incumbent, voters in the RI treatment were the only ones to respond to their incumbent taking the most relative to the other senior incumbents. Therefore the ability to compare the behavior between senior incumbents was a key determinant of voters' responses and lead to a higher rate of electing a challenger.

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[18] The 95% confidence interval of the change in predicted probability: (-0.40, -0.15).

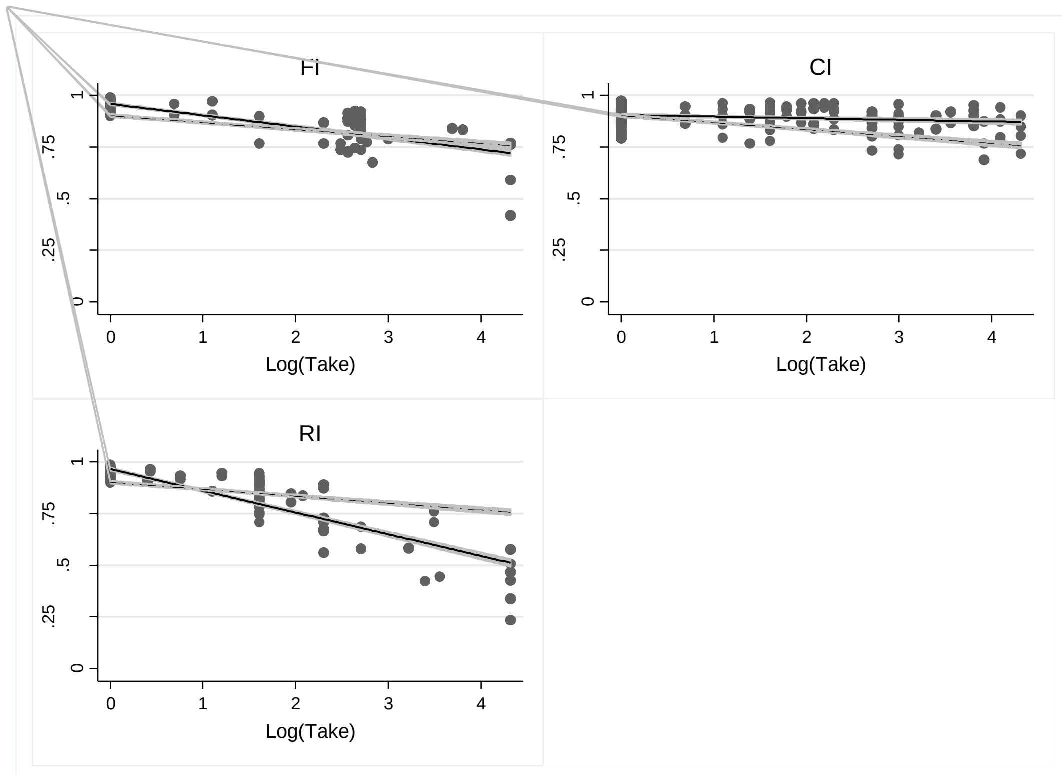

Figure 6: Predicted Probabilities by Treatment. The solid lines are the regression lines from the respective treatments. The dashed line is the regression line from the predicted probabilities in the baseline NI treatment.

Another result that merits notice is the positive and significant impact that the level of efficiency had on the likelihood of voting for the incumbent after controlling for shirking. Recall that efficiency was a randomly generated variable that affected subjects' period payoff after the incumbents decided how much to take from voters. Despite this fact, subjects were more likely to vote for the incumbent when efficiency was high even when controlling for the incumbent's take. Because payoffs are correlated with an incumbent's seniority this might be attributed to the seniority advantage in the experiment, but the sample includes only those voters with a senior incumbent. Thus it appears that voters rewarded incumbents for outcomes they could not control. This is consistent with studies confirming sociotropic voting (Kinder and Kiewiet 1981, Lewis-Beck and Paldam 2000, Gomez and Wilson 2001, Duch and Stevenson 2008). Nevertheless, the effect is not large. The mean level of efficiency was 0.71 from a possible range of [1/3,1] and an increase in efficiency of one-standard deviation (0.21) increased the likelihood of voting for the incumbent by 4 percent according to a first difference in predicted probabilities at the 95% significance level.[19]

6 Discussion and Conclusions

This paper addresses electoral accountability and the interaction between voter information and legislative seniority. A legislative system that favors seniority in allocating transfers, i.e. pork, may lead voters to disregard legislator shirking. Nevertheless, voters may also be simply uninformed. Shirking can take many forms, but here it is framed as excessive taking at the voters' expense; however, the model can be applied to any effort decision by an incumbent. A model is constructed where pork is awarded according to seniority, and in equilibrium legislators use this to maintain incumbency even though they transfer all of the benefits to themselves. The experimental treatments vary the amount of information voters receive about incumbent choices to determine the impact it has on voters' behavior in light of the powerful seniority advantage.

Results suggest that information helped overcome the moral hazard problem by discouraging legislator shirking to some degree. Incumbents were less likely to shirk and to a lesser extent when full information about the incumbent's choice was given to voters. When voters were able to compare their incumbent's behavior to others', legislators shirked at roughly the same frequency as when information was not freely provided, but to a lesser degree. This suggests that incumbents were willing to take positive amounts from voters, but did not want to be the one taking the most. Voters succumbed to the incentives of seniority evidenced by the insignificant differences in reelection rates between the NI, FI and CI treatments. Senior incumbents who took from voters were almost always reelected even in the full information and costly information cases. However, providing voters with relative information about incumbent behavior significantly lowered the tolerance for a shirking incumbent. Voters did not usually purchase information when it was costly, but they were significantly more likely to do so after experiencing a negative change in payoff from one period to the next.

[19] The 95% confidence interval of the change in predicted probability : (0.01, 0.07).

Analysis at the individual level revealed that the average voter in the RI treatment was significantly less likely to vote for a shirking incumbent than the voters in other treatments. The average voter in the NI, FI or CI treatment responded to excessive taking but not to an extent that affected reelection rates. Thus the collective action inherent in politics is evident in the results.

A simple explanation for why reelection was so high in every treatment is the possible incongruity between voter expectations about incumbent behavior, which may be primed by the information treatments, and the low levels of shirking observed. Common knowledge of incentives possibly led voters to form expectations about what their payoffs would be before playing a single round of the game. If subjects use backward induction to form an expectation that senior incumbents will leave them with little or nothing each period, than any amount greater than zero is acceptable, but evidence from the ultimatum game suggests most subjects do not reason this way. Even so, if they form some prior belief of receiving $\$0.45>\$X>0$ based on the seniority advantage in the legislature, receiving an amount $\$X + \xi$ would give reason to reelect the incumbent. Subjects have been shown to react positively or negatively based on being treated fairly in distributive games (Charness and Rabin 2002). As shown above, the ex-post amount voters receive on average is much greater than the 40 – 50% of the possible payoff usually redistributed in ultimatum games, let alone the equilibrium prediction. This might also explain the differences found in the RI treatment reelection rate where expectations are affected not only by the voter's own legislator but what other senior legislators did.

Perhaps reelection rates would not have been so high in a setting where the redistribution from junior to senior voters was not so great. Across all treatments fifteen senior incumbents lost reelection, but three of these instances occurred in the last three periods of the experiment. There were several districts that began with a senior incumbent and never elected a challenger: four in the NI treatment, two in the FI treatment, five in the CI treatment and two in the RI treatment. Of the districts that began with a junior incumbent, only one elected a challenger once senior status was achieved.

The average wait for seniority after kicking a shirking senior incumbent out of office was 4.56 periods (n=18; st.dev. 3.55) with the maximum being eleven and the minimum being one period. This means that the voters gave up approximately $1.87 on average when electing a challenger over a senior incumbent. The voters who kicked a senior incumbent out of office and never achieved seniority status again averaged 6.5 periods (n=8; st.dev. 3.66) between the election of a junior challenger and the end of the game. These voters gave up \$2.66 on average.[20] Excluding the three cases where the incumbent left office with only three periods left to play increases this to \$3.60. If we take nine cents per period as the average loss per voter in a senior district, where the ex-ante expected payoff is fifty-cents per period (75*2/3) and the ex-post expected payoff is forty-one cents period ((75-13.56)*2/3), keeping the incumbent and losing a total of \$0.41 over these 4.56 periods rather than electing a challenger and losing \$1.87 is of course rational.

A simpler but rougher metric compares the average final earnings of the voters in the upper quintile of cumulative seniority to those in the bottom quintile. The number of periods a voter had a senior legislator in office were totaled and broken into quintiles. Those in the upper quintile averaged \$6.34 more in final earnings than the voters in the bottom quintile of cumulative seniority- a substantial difference considering the average earnings of \$18 per subject. This figure may be skewed by the districts that only achieved seniority status in the last two or three periods of the game; however, it still provides a look at what voters were potentially giving up by kicking a senior incumbent out of office.

The cards may have been stacked against finding that voters would care about legislator shirking in this setting. The similarity between this experiment and that in Rodet (2011) allows us to compare voter reactions to two different forms of shirking. In that experiment legislators could support a policy that the majority of voters disagreed with. The experiment uses subjects' preferences on abortion and operationalizes policy choice by having legislators determine whether a pro-choice or pro-life organization would receive a donation. Abortion was selected to induce hot cognitions (Zajonc 1980). The voter information conditions of the FI treatment and the No Term Limit treatment of that paper are directly comparable. Comparing reelection rates of shirking and non-shirking senior incumbents between the two treatments reveals that there is no statistical difference between treatments as shown in Table 5. However, there is a statistically significant difference within the No Term Limit treatment between shirking and non-shirking incumbents which is not

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[20] These totals were calculated using the average amount taken by legislators across all treatments (13.56 cents) and the expected transfer efficiency (2/3) and the average number of periods of seniority given up. So voters that achieved seniority a second time lost on average (75-13.56)*(2/3)*(4.56) = \$1.87. Those that gave up seniority and never regained it gave up (75-13.56)*(2/3)*(6.5) = \$2.66.

present in the FI treatment. Thus it appears that voters care about shirking when it comes to a policy issue like abortion under a similar payoff and seniority rules.[21]

Table 5: Comparing Reelection of Shirking Incumbents

Treatment	Shirking	No Shirking	P value (within)	P value (between)
FI	94% (0.04) n = 48	97% (0.03) n = 36	0.23	0.14
Policy	86% (0.07) n = 29	96% (0.03) n = 52	0.05	

Rates only include senior incumbents and exclude the last period. Data from Rodet (2010) is from the three sessions that used the same five district design and had similar payoffs.

Finally, the possibility that voters were displaying other-regarding preferences by allowing fellow subjects to increase their payoff at the voters' expense can be ruled out by the fact that active legislators are guaranteed sixty cents each period compared to the senior voters' ex-ante expected payoff of fifty cents (assuming the incumbent takes nothing). Subjects could not be so generous to want to give to others who are expected to make more each period. On the other hand, this also suggests a lack of inequality aversion by voters. Of course aggregating choices in the district masks the extent at which certain individuals display this aversion, but overall it appears that voters concentrate on their own payoff. Both disadvantageous inequality aversion between legislator and voter and advantageous inequality aversion between senior and junior voters would suggest lower reelection rates. Using a modified version of Bolton and Ockenfels (2000) ERC model, let ξ represent the proportion of relativist voters and let (1 – ξ) be of the proportion of egoist voters. A relativist voter will care about the difference between her own payoff and that of the incumbent, and will vote against the shirking incumbent $(v = 0)$. An egoist will simply maximize her own payoff and vote to reelect an incumbent regardless of the amount taken $(v = 1)$. This simply means that the proportion of votes in favor of the incumbent is $\overline{v} = (1 - \xi) * 1 + \xi * 0 = 1 - \xi$. Thus, $\xi = 1 - \overline{v}$. This can be taken directly from the data. For all treatments combined

[21] Important caveats include the difference in the number of periods, where the Policy Treatment only includes ten paying periods instead of fifteen, and the random efficiency variable that appears in this design.

$\xi = 28\%$. For the NI, FI, CI and RI treatments respectively, it measures as thirty-four, twenty-seven, twenty-one and thirty-two percent. Thus, even at the individual level, the proportion of subjects exhibiting other regarding preferences appears low.

From a policy perspective, providing information to voters slightly discourages incumbents from abusing the benefits of seniority. Two important design elements may have impacted the rate of shirking. First, incumbents could only take from the voters in their district rather than from general tax revenues. In a way, incumbents could put a face with the dollars they spent unlike legislators in the US Congress. A format where legislators take from all voters in general may have led to more shirking.[22] Second, the incumbents in the experiment could not psychologically defend their decisions as being good for the group as is often done when public officials are on fact finding trips to Italy. Creating some sort of barrier between voters and incumbents may have led to more shirking.

What then would mitigate the power of seniority in the legislature? Admittedly the model employed omits an arguably important element found in multi-member districts. Having two or more legislators representing the same electorate possibly curbs some of this power because voters can balance representation with the combined seniority of both senators. Ignoring special interests, this may mean voters can sack one legislator for truly egregious shirking and still maintain some seniority.

Term limits have been proposed as a way to mitigate the incentives created by seniority; however, Rodet (2011) experimentally tests such an institution and it suffers from the same natural difficulty that information revelation did here, namely the collective action problem of changing the status quo. On average, voters seemed to perceive that term limits reduced the cost of replacing an incumbent with seniority power, but re-election rates were not affected. Therefore, seeking to reduce the influence of seniority ought to be a topic of further research.

[22] Increasing group size may have a similar effect.

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Appendix

A.1 Sample of Instructions

A.1.1 No Information Treatment

Thank you for coming on time and participating in today's experiment. This is an experiment on decision-making and you will have the opportunity to earn money according to the choices you make. Please do not talk during the experiment and do not use any device such as a cell phone, mp3 player or texting device. If you have a question, please raise your hand and I will be by to answer your question privately.

ROUND ONE

The experiment consists of two rounds. The first round will last five periods. First we will go over the instructions for Round One. In today's experiment you will be assigned a role. You will be randomly selected to be either a Type A player or a Type B player. There will be five groups of players in the experiment, and each group will have three Type A players and one Type B player. There are a total of 15 Type A players and 10 Type B players in the experiment. This means that at any point in time, half of the Type B players will be in a group and half of them will not. You will be informed of your role shortly, but first we will discuss the differences between types and how the groups work.

Type A players receive an endowment of 45 cents each period, which they will either keep or contribute to a public account that will be divided among the groups. Each period the Type B players from each group vote to decide how the Type A players will use their endowments. The outcome is determined by a simple majority rule. That is, if at least three Type B players vote for keeping the endowment, the Type A players keep their endowments that period. If at least three Type B players vote for contributing to the public account, the Type A players will contribute their endowments to the public account and may receive a portion of the overall sum. This will happen every period.

Type B players are either Active or Inactive. Whether a Type B player is Active or Inactive can change from period to period. Active Type B players belong to groups, vote and receive a salary of 60 cents each period for their participation in their groups. Inactive Type B players do not belong to any group, do not vote and do not earn a salary. They are waiting for the opportunity to replace an Active Type B player. While they are waiting they will have a chance to earn some money in another activity decoding words for 2.5 cents for every correct code. I will explain how that works shortly.

After Active Type B players vote to determine how Type A players will use their endowments, the Type A players will see their own payoff and vote within their group whether to keep the Type B player for the next period or to replace them. The Type A players will not see the choice made by their group's Active Type B player. The outcome is based on what the majority of the Type A players in the group vote for. If at least two Type A players from the group vote to keep the Type B player, he or she will stay for at least one more period. If at least two of the Type A players vote to replace the Type B player, that Active Type B player becomes Inactive and is replaced by a randomly chosen Inactive Type B player. Type A players will vote every period.

The table below summarizes the different roles and group make up.

Role	Number in each Group	Activity	Pay
Type A	3	Vote on Type B players	Keep 45 cents or Split the Public Account
Active Type B	1	Vote on Type A endowments	60 cents
Inactive Type B	0	Decode text strings	2.5 cents for every correct code

Now I will explain how the public account is split up. The amount a group receives from the public account is based on the tenure rank of its Type B player. That is, the Active Type B players will be ranked based on the number of consecutive periods they have been Active and this determines the amount their group gets from the public account. The Active Type B player that is ranked first has the highest number of consecutive periods as an Active Type B player, the second ranked has the second highest number of consecutive periods as an Active Type B player, and so on.

Tenure rank can change based on the groups' decisions to keep or replace their Active Type B players. For example, if you are in a group whose Active Type B player is ranked 3rd, he or she has the third highest amount of consecutive periods of activity. If the 2^{nd} ranked Active Type B player is replaced, then all the Active Type B players ranked lower than 2^{nd} will move up in the ranking. That is, the 3^{rd} ranking Active Type B player will become the 2^{nd} ranked Active Type B player, the 4^{th} ranking Active Type B player will become the 3^{rd} ranked, and so on. The Active Type B player ranked first will not be affected. If an Inactive Type B player becomes Active, they will begin at the bottom of the ranking. If more than one Type B player is activated at the same time, and thus have the same tenure, their ranks will be determined randomly.

The Type A players will know the ranks of each group's Active Type B player. The Active Type B players will know their own rank.

The three groups whose Active Type B players are ranked 1st, 2nd, and 3rd will receive 1/3 of the public account. This 1/3 will then be divided evenly among all the Type A players within those groups. The two groups whose current Type B players are ranked 4th and 5th will contribute to the public account, but will not receive a share when it is split up. To begin each round, the tenure rank will be randomly assigned to the Active Type B players. Thereafter, the tenure rank is determined by the number of periods as an Active Type B player.

The public account is subject to efficiency problems such that the total amount distributed from the account may be less than the amount contributed by all of the Type A players. We'll call this efficiency variable α and it is randomly drawn between 1/3 and 1. It will be randomly drawn each period.

If the Type A players keep their endowments, the public account contains nothing. If each Type A player contributes their 45 cents to the public account, there is (15 x 45) = 675 cents in the public account to be split up. (There are a total of 15 Type A players and each has 45 cents.) If your group receives 1/3 of the public account, it will receive α x 225 cents (α x 675 x 1/3) to split among the Type A players, or α x 75 cents for each Type A player (α x 225 x 1/3). That means that a Type A player that receives a positive share of the public account can receive as much as 75 cents if α =1 and as little as 25 cents if α = 1/3. Remember that each Type A player begins with 45 cents each period.

For example, suppose that the Active Type B players decide that the Type A players will contribute their endowments to the public account. Also, suppose the randomly drawn value of α is 0.85. The payoff to the Type A players in this group would be 0.85 x 75 = 63.75 cents for that period. The Active Type B player's payoff would be 60 cents for that period.

The Type B players DO NOT know the value of α when making their decision regarding the endowments of the Type A players. However, while the Active Type B players are making their decisions, they will have a calculator that they can try different values of the efficiency variable, α, to see what payoffs are possible for the Type A players if they contribute their endowments to the public account. The Type A players will also have the same calculator. After the Type B players' votes are counted the Type A players will not see the value of the efficiency variable, α, nor the vote cast by the group's Active Type B player or the result, but they will see their resulting payoffs. They will then make their decisions regarding the group's Type B player.

We will go through a few examples using the calculator so you have an idea how it works and what the numbers mean.

To begin, the first round of five periods will function as I have explained. Half of the Type B players are Active and half are Inactive. The rank of Active Type B players has been randomly determined to begin the round.

If you are a Type A player you will also see your group number for this round. Remember you will be a Type A player for the entire round. If you are a Type B player you will see whether you are Active or Inactive. Remember, you will be a Type B player for the entire round. When voting begins, the top of the screen will remind you of the Round and Period numbers and your role. If you are a Type A player you will see your Group number and your earnings for the entire experiment. If you are a Type B player you will see whether you are active or inactive, your tenure rank if you are active and your earnings for the entire experiment.

Decoding

I will quickly explain what the Inactive Type B players are doing while the others are voting. If you are Inactive you will see a screen like the one shown at the front of the room. You will be decoding lines of text and can earn 2.5 cents for every line of text you decode correctly. Notice the first box contains instructions and the second box contains the decoding key. You will use this to find the numbers that correspond to the letters given to you as shown. You will enter each number and hit "OK". Notice the box in the lower left corner keeps track of the number of correct and incorrect codes, along with your earnings from decoding. In order for the code to count as correct, you must get the entire string correct. These earnings will be added to any earnings you receive while playing as an Active Type B player. There is no limit on how many codes you can be paid for, but your time is limited by the amount of time it takes for the Active Type B players and Type A players to vote. After the Active Type B players vote there will be a short pause informing you that the Type B players have voted and where you will see your current status. After that you will continue decoding while the Type A players make their decisions.

If there are no questions we will begin the first round of the experiment. Please click the OK button at the bottom of your screen.

A.1.2 Full Information Treatment

Thank you for coming on time and participating in today's experiment. This is an experiment on decision-making and you will have the opportunity to earn money according to the choices you make. Please do not talk during the experiment and do not use any device such as a cell phone, mp3 player or texting device. If you have a question, please raise your hand and I will be by to answer your question privately.

ROUND ONE

The experiment consists of two rounds. The first round will last five periods. First we will go over the instructions for Round One. In today's experiment you will be assigned a role. You will be randomly selected to be either a Type A player or a Type B player. There will be five groups of players in the experiment, and each group will have three Type A players and one Type B player. There are a total of 15 Type A players and 10 Type B players in the experiment. This means that at any point in time, half of the Type B players will be in a group and half of them will not. You will be informed of your role shortly, but first we will discuss the differences between types and how the groups work.

Type A players receive an endowment of 45 cents each period, which they will either keep or contribute to a public account that will be divided among the groups. Each period the Type B players from each group vote to decide how the Type A players will use their endowments. The outcome is determined by a simple majority rule. That is, if at least three Type B players vote for keeping the endowment, the Type A players keep their endowments that period. If at least three Type B players vote for contributing to the public account, the Type A players will contribute their endowments to the public account and may receive a portion of the overall sum. Type A players will see the outcome of the vote as well as the vote cast by the Type B player from their group. This will happen every period.

Type B players are either Active or Inactive. Whether a Type B player is Active or Inactive can change from period to period. Active Type B players belong to groups, vote and receive a salary of 60 cents each period for their participation in their groups. Inactive Type B players do not belong to any group, do not vote and do not earn a salary. They are waiting for the opportunity to replace an Active Type B player. While they are waiting they will have a chance to earn some money in another activity decoding words for 2.5 cents for every correct code. I will explain how that works shortly.

After Active Type B players vote to determine how Type A players will use their endowments, the Type A players will see the group's Active Type B player's choice and the outcome and vote within their group whether to keep the Type B player for the next period or to replace them. The outcome is based on what the majority of the Type A players in the group vote for. If at least two Type A players from the group vote to keep the Type B player, he or she will stay for at least one more period. If at least two of the Type A players vote to replace the Type B player, that Active Type B player becomes Inactive and is replaced by a randomly chosen Inactive Type B player. Type A players will vote every period.

The table below summarizes the different roles and group make up.

Role	Number in each Group	Activity	Pay
Type A	3	Vote on Type B players	Keep 45 cents or Split the Public Account
Active Type B	1	Vote on Type A endowments	60 cents
Inactive Type B	0	Decode text strings	2.5 cents for every correct code

Now I will explain how the public account is split up. The amount a group receives from the public account is based on the tenure rank of its Type B player. That is, the Active Type B players will be ranked based on the number of consecutive periods they have been Active and this determines the amount their group gets from the public account. The Active Type B player that is ranked first has the highest number of consecutive periods as an Active Type B player, the second ranked has the second highest number of consecutive periods as an Active Type B player, and so on.

Tenure rank can change based on the groups' decisions to keep or replace their Active Type B players. For example, if you are in a group whose Active Type B player is ranked 3rd, he or she has the third highest amount of consecutive periods of activity. If the 2nd ranked Active Type B player is replaced, then all the Active Type B players ranked lower than 2nd will move up in the ranking. That is, the 3rd ranking Active Type B player will become the 2nd ranked Active Type B player, the 4th ranking Active Type B player will become the 3rd ranked, and so on. The Active Type B player ranked first will not be affected. If an Inactive Type B player becomes Active, they will begin at the bottom of the ranking. If more than one Type B player is activated at the same time, and thus have the same tenure, their ranks will be determined randomly.

The Type A players will know the ranks of each group's Active Type B player. The Active Type B players will know their own rank.

The three groups whose Active Type B players are ranked 1st, 2nd, and 3rd will receive 1/3 of the public account. This 1/3 will then be divided evenly among all the Type A players within those groups. The two groups whose current Type B players are ranked 4th and 5th will contribute to the public account, but will not receive a share when it is split up. To begin each round, the tenure rank will be randomly assigned to the Active Type B players.

Thereafter, the tenure rank is determined by the number of periods as an Active Type B player.

The public account is subject to efficiency problems such that the total amount distributed from the account may be less than the amount contributed by all of the Type A players. We'll call this efficiency variable α and it is randomly drawn between (1/3) and 1. It will be randomly drawn each period.

If the Type A players keep their endowments, the public account contains nothing. If each Type A player contributes their 45 cents to the public account, there is (15 x 45) = 675 cents in the public account to be split up. (There are a total of 15 Type A players and each has 45 cents.) If your group receives 1/3 of the public account, it will receive α x 225 cents (α x 675 x 1/3) to split among the Type A players, or α x 75 cents for each Type A player (α x 225 x 1/3). That means that a Type A player that receives a positive share of the public account can receive as much as 75 cents if α =1 and as little as 25 cents if α = 1/3. Remember that each Type A player begins with 45 cents each period.

For example, suppose that the Active Type B players decide that the Type A players will contribute their endowments to the public account. Also, suppose the randomly drawn value of α is 0.85. The payoff to the Type A players in this group would be 0.85 x 75 = 63.75 cents for that period. The Active Type B player's payoff would be 60 cents for that period.

The Type B players DO NOT know the value of α when making their decision regarding the endowments of the Type A players. However, while the Active Type B players are making their decisions, they will have a calculator that they can try different values of the efficiency variable, α, to see what payoffs are possible for the Type A players if they contribute their endowments to the public account. The Type A players will also have the same calculator. After the Type B players' votes are counted the Type A players will see the value of the efficiency variable, α, the vote cast by the group's Active Type B player, and the voting result as well as their resulting payoffs. They will then make their decisions regarding the group's Type B player.

We will go through a few examples using the calculator so you have an idea how it works and what the numbers mean.

To begin, the first round of five periods will function as I have explained. Half of the Type B players are Active and half are Inactive. The rank of Active Type B players has been randomly determined to begin the round.

The next screen will show you your role. If you are a Type A player you will also see your group number for this round. Remember you will be a Type A player for the entire round. If you are a Type B player you will see whether you are Active or Inactive. Remember, you will be a Type B player for the entire round. When voting begins, the top of the screen will remind you of the Round and Period numbers and your role. If you are a Type A player you will see your Group number and your earnings for the entire experiment. If you are a Type B player you will see whether you are active or inactive, your tenure rank if you are active and your earnings for the entire experiment.

Decoding

I will quickly explain what the Inactive Type B players are doing while the others are voting. If you are Inactive you will see a screen like the one shown at the front of the room. You will be decoding lines of text and can earn 2.5 cents for every line of text you decode correctly. Notice the first box contains instructions and the second box contains the decoding key. You will use this to find the numbers that correspond to the letters given to you as shown. You will enter each number and hit "OK". Notice the box in the lower left corner keeps track of the number of correct and incorrect codes, along with your earnings from decoding. In order for the code to count as correct, you must get the entire string correct. These earnings will be added to any earnings you receive while playing as an Active Type B player. There is no limit on how many codes you can be paid for, but your time is limited by the amount of time it takes for the Active Type B players and Type A players to vote. After the Active Type B players vote there will be a short pause informing you that the Type B players have voted and where you will see your current status. After that you will continue decoding while the Type A players make their decisions.

If there are no questions we will begin the first round of the experiment. Please click the OK button at the bottom of your screen.

A.1.3 Costly Information Treatment

Thank you for coming on time and participating in today's experiment. This is an experiment on decision-making and you will have the opportunity to earn money according to the choices you make. Please do not talk during the experiment and do not use any device such as a cell phone, mp3 player or texting device. If you have a question, please raise your hand and I will be by to answer your question privately.

ROUND ONE

The experiment consists of two rounds. The first round will last five periods. First we will go over the instructions for Round One. In today's experiment you will be assigned a role. You will be randomly selected to be either a Type A player or a Type B player. There will be five groups of players in the experiment, and each group will have three Type A players and one Type B player. There are a total of 15 Type A players and 10 Type B players in the experiment. This means that at any point in time, half of the Type B players will be in a group and half of them will not. You will be informed of your role shortly, but first we will discuss the differences between types and how the groups work.

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Type B players are either Active or Inactive. Whether a Type B player is Active or Inactive can change from period to period. Active Type B players belong to groups, vote and receive a salary of 60 cents each period for their participation in their groups. Inactive Type B players do not belong to any group, do not vote and do not earn a salary. They are waiting for the opportunity to replace an Active Type B player. While they are waiting they will have a chance to earn some money in another activity decoding words for 2.5 cents for every correct code. I will explain how that works shortly.

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The table below summarizes the different roles and group make up.

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Type A	3	Vote on Type B players	Keep 45 cents or Split the Public Account

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Inactive Type B	0	Decode text strings	2.5 cents for every correct code

Now I will explain how the public account is split up. The amount a group receives from the public account is based on the tenure rank of its Type B player. That is, the Active Type B players will be ranked based on the number of consecutive periods they have been Active and this determines the amount their group gets from the public account. The Active Type B player that is ranked first has the highest number of consecutive periods as an Active Type B player, the second ranked has the second highest number of consecutive periods as an Active Type B player, and so on.

Tenure rank can change based on the groups' decisions to keep or replace their Active Type B players. For example, if you are in a group whose Active Type B player is ranked 3rd, he or she has the third highest amount of consecutive periods of activity. If the 2nd ranked Active Type B player is replaced, then all the Active Type B players ranked lower than 2nd will move up in the ranking. That is, the 3rd ranking Active Type B player will become the 2nd ranked Active Type B player, the 4th ranking Active Type B player will become the 3rd ranked, and so on. The Active Type B player ranked first will not be affected. If an Inactive Type B player becomes Active, they will begin at the bottom of the ranking. If more than one Type B player is activated at the same time, and thus have the same tenure, their ranks will be determined randomly.

The Type A players will know the ranks of each group's Active Type B player. The Active Type B players will know their own rank.

The three groups whose Active Type B players are ranked 1st, 2nd, and 3rd will receive 1/3 of the public account. This 1/3 will then be divided evenly among all the Type A players within those groups. The two groups whose current Type B players are ranked 4th and 5th will contribute to the public account, but will not receive a share when it is split up. To begin each round, the tenure rank will be randomly assigned to the Active Type B players. Thereafter, the tenure rank is determined by the number of periods as an Active Type B player.

The public account is subject to efficiency problems such that the total amount distributed from the account may be less than the amount contributed by all of the Type A players. We'll call this efficiency variable α and it is randomly drawn between 1/3 and 1. It will be randomly drawn each period.

If the Type A players keep their endowments, the public account contains nothing. If each Type A player contributes their 45 cents to the public account, there is (15 x 45) = 675 cents in the public account to be split up. (There are a total of 15 Type A players and each has 45 cents.) If your group receives 1/3 of the public account, it will receive ∝ x 225 cents (∝ x 675 x 1/3) to split among the Type A players, or ∝ x 75 cents for each Type A player (∝ x 225 x 1/3). That means that a Type A player that receives a positive share of the public account can receive as much as 75 cents if ∝ =1 and as little as 25 cents if ∝ = 1/3. Remember that each Type A player begins with 45 cents each period.

For example, suppose that the Active Type B players decide that the Type A players will contribute their endowments to the public account. Also, suppose the randomly drawn value of ∝ is 0.85. The payoff to the Type A players in this group would be 0.85 x 75 = 63.75 cents for that period. The Active Type B player's payoff would be 60 cents for that period.

The Type B players DO NOT know the value of ∝ when making their decision regarding the endowments of the Type A players. However, while the Active Type B players are making their decisions, they will have a calculator that they can try different values of the efficiency variable, ∝,to see what payoffs are possible for the Type A players if they contribute their endowments to the public account. The Type A players will also have the same calculator.

After the Type B players' votes are counted the Type A players will not see the value of the efficiency variable, ∝, nor the vote cast by the group's Active Type B player or the result, but they will see their resulting payoffs. They will then make their decisions regarding the group's Type B player.

We will go through a few examples using the calculator so you have an idea how it works and what the numbers mean.

To begin, the first round of five periods will function as I have explained. Half of the Type B players are Active and half are Inactive. The rank of Active Type B players has been randomly determined to begin the round.

You will be informed of your role shortly. If you are a Type A player you will also see your group number for this round. Remember you will be a Type A player for the entire round. If you are a Type B player you will see whether you are Active or Inactive. Remember, you will be a Type B player for the entire round. When voting begins, the top of the screen will remind you of the Round and Period numbers and your role. If you are a Type A player you will see your Group number and your earnings for the entire experiment. If you are a Type B player you will see whether you are active or inactive, your tenure rank if you are active and your earnings for the entire experiment.

Decoding

I will quickly explain what the Inactive Type B players are doing while the others are voting. If you are Inactive you will see a screen like the one shown at the front of the room. You will be decoding lines of text and can earn 2.5 cents for every line of text you decode correctly. Notice the first box contains instructions and the second box contains the decoding key. You will use this to find the numbers that correspond to the letters given to you as shown. You will enter each number and hit "OK". Notice the box in the lower left corner keeps track of the number of correct and incorrect codes, along with your earnings from decoding. In order for the code to count as correct, you must get the entire string correct. These earnings will be added to any earnings you receive while playing as an Active Type B player. There is no limit on how many codes you can be paid for, but your time is limited by the amount of time it takes for the Active Type B players and Type A players to vote. After the Active Type B players vote there will be a short pause informing you that the Type B players have voted and where you will see your current status. After that you will continue decoding while the Type A players make their decisions.

If there are no questions we will begin the first round of the experiment. Please click the OK button at the bottom of your screen.

A.1.4 Full and Relative Information Treatment

Thank you for coming on time and participating in today's experiment. This is an experiment on decision-making and you will have the opportunity to earn money according to the choices you make. Please do not talk during the experiment and do not use any device such as a cell phone, mp3 player or texting device. If you have a question, please raise your hand and I will be by to answer your question privately.

ROUND ONE

The experiment consists of two rounds. The first round will last five periods. First we will go over the instructions for Round One. In today's experiment you will be assigned a role. You will be randomly selected to be either a Type A player or a Type B player. There will be five groups of players in the experiment, and each group will have three Type A players and one Type B player. There are a total of 15 Type A players and 10 Type B players in the experiment. This means that at any point in time, half of the Type B players will be in a group and half of them will not. You will be informed of your role shortly, but first we will discuss the differences between types and how the groups work.

Type A players receive an endowment of 45 cents each period, which they will either keep or contribute to a public account that will be divided among the groups. Each period the Type B players from each group vote to decide how the Type A players will use their endowments. The outcome is determined by a simple majority rule. That is, if at least three Type B players vote for keeping the endowment, the Type A players keep their endowments that period. If at least three Type B players vote for contributing to the public account, the Type A players will contribute their endowments to the public account and may receive a portion of the overall sum. Type A players will see the outcome of the vote as well as the vote cast by the Type B player from their group. This will happen every period.

Type B players are either Active or Inactive. Whether a Type B player is Active or Inactive can change from period to period. Active Type B players belong to groups, vote and receive a salary of 60 cents each period for their participation in their groups. Inactive Type B players do not belong to any group, do not vote and do not earn a salary. They are waiting for the opportunity to replace an Active Type B player. While they are waiting they will have a chance to earn some money in another activity decoding words for 2.5 cents for every correct code. I will explain how that works shortly.

After Active Type B players vote to determine how Type A players will use their endowments, the Type A players will see the group's Active Type B player's choice and the outcome and vote within their group whether to keep the Type B player for the next period or to replace them. The outcome is based on what the majority of the Type A players in the group vote for. If at least two Type A players from the group vote to keep the Type B player, he or she will stay for at least one more period. If at least two of the Type A players vote to replace the Type B player, that Active Type B player becomes Inactive and is replaced by a randomly chosen Inactive Type B player. Type A players will vote every period.

The table below summarizes the different roles and group make up.

Role	**Number in each Group**	**Activity**	**Pay**
Type A	3	Vote on Type B players	Keep 45 cents or Split the Public Account
Active Type B	1	Vote on Type A endowments	60 cents
Inactive Type B	0	Decode text strings	2.5 cents for every correct code

Now I will explain how the public account is split up. The amount a group receives from the public account is based on the tenure rank of its Type B player. That is, the Active Type B players will be ranked based on the number of consecutive periods they have been Active and this determines the amount their group gets from the public account. The Active Type B player that is ranked first has the highest number of consecutive periods as an Active Type B player, the second ranked has the second highest number of consecutive periods as an Active Type B player, and so on.

Tenure rank can change based on the groups' decisions to keep or replace their Active Type B players. For example, if you are in a group whose Active Type B player is ranked 3rd, he or she has the third highest amount of consecutive periods of activity. If the 2nd ranked Active Type B player is replaced, then all the Active Type B players ranked lower than 2nd will move up in the ranking. That is, the 3rd ranking Active Type B player will become the 2nd ranked Active Type B player, the 4th ranking Active Type B player will become the 3rd ranked, and so on. The Active Type B player ranked first will not be affected. If an Inactive Type B player becomes Active, they will begin at the bottom of the ranking. If more than one Type B player is activated at the same time, and thus have the same tenure, their ranks will be determined randomly.

The Type A players will know the ranks of each group's Active Type B player. The Active Type B players will know their own rank.

The three groups whose Active Type B players are ranked 1st, 2nd, and 3rd will receive 1/3 of the public account. This 1/3 will then be divided evenly among all the Type A players within those groups. The two groups whose current Type B players are ranked 4th and 5th will contribute to the public account, but will not receive a share when it is split up. To begin each round, the tenure rank will be randomly assigned to the Active Type B players. Thereafter, the tenure rank is determined by the number of periods as an Active Type B player.

The public account is subject to efficiency problems such that the total amount distributed from the account may be less than the amount contributed by all of the Type A players. We'll call this efficiency variable α and it is randomly drawn between (1/3) and 1. It will be randomly drawn each period.

If the Type A players keep their endowments, the public account contains nothing. If each Type A player contributes their 45 cents to the public account, there is (15 x 45) = 675 cents in the public account to be split up. (There are a total of 15 Type A players and each has 45 cents.) If your group receives 1/3 of the public account, it will receive α x 225 cents (α x 675 x 1/3) to split among the Type A players, or α x 75 cents for each Type A player (α x 225 x 1/3). That means that a Type A player that receives a positive share of the public account can receive as much as 75 cents if α =1 and as little as 25 cents if α = 1/3. Remember that each Type A player begins with 45 cents each period.

For example, suppose that the Active Type B players decide that the Type A players will contribute their endowments to the public account. Also, suppose the randomly drawn value of α is 0.85. The payoff to the Type A players in this group would be 0.85 x 75 = 63.75 cents for that period. The Active Type B player's payoff would be 60 cents for that period.

The Type B players DO NOT know the value of α when making their decision regarding the endowments of the Type A players. However, while the Active Type B players are making their decisions, they will have a calculator that they can try different values of the efficiency variable, α, to see what payoffs are possible for the Type A players if they contribute their endowments to the public account. The Type A players will also have the same calculator. After the Type B players' votes are counted the Type A players will see the value of the efficiency variable, α, the vote cast by the group's Active Type B player, and the voting result as well as their resulting payoffs. They will then make their decisions regarding the group's Type B player.

We will go through a few examples using the calculator so you have an idea how it works and what the numbers mean.

To begin, the first round of five periods will function as I have explained. Half of the Type B players are Active and half are Inactive. The rank of Active Type B players has been randomly determined to begin the round.

The next screen will show you your role. If you are a Type A player you will also see your group number for this round. Remember you will be a Type A player for the entire round. If you are a Type B player you will see whether you are Active or Inactive. Remember, you will be a Type B player for the entire round. When voting begins, the top of the screen will remind you of the Round and Period numbers and your role. If you are a Type A player you will see your Group number and your earnings for the entire experiment. If you are a Type B player you will see whether you are active or inactive, your tenure rank if you are active and your earnings for the entire experiment.

Decoding

I will quickly explain what the Inactive Type B players are doing while the others are voting. If you are Inactive you will see a screen like the one shown at the front of the room. You will be decoding lines of text and can earn 2.5 cents for every line of text you decode correctly. Notice the first box contains instructions and the second box contains the decoding key. You will use this to find the numbers that correspond to the letters given to you as shown. You will enter each number and hit "OK". Notice the box in the lower left corner keeps track of the number of correct and incorrect codes, along with your earnings from decoding. In order for the code to count as correct, you must get the entire string correct. These earnings will be added to any earnings you receive while playing as an Active Type B player. There is no limit on how many codes you can be paid for, but your time is limited by the amount of time it takes for the Active Type B players and Type A players to vote. After the Active Type B players vote there will be a short pause informing you that the Type B players have voted and where you will see your current status. After that you will continue decoding while the Type A players make their decisions.

If there are no questions we will begin the first round of the experiment. Please click the OK button at the bottom of your screen.