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Documentos de Trabajo

JOHN M. CAREY

Transparency & Legislative Behavior



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Abstract: Do representatives behave differently when their actions are observed by citizens versus when they are not observed? Intuition suggests the answer is yes, but non-transparent legislative processes in many countries present obstacles to conventional empirical research. This paper presents preliminary results from an experiment designed test what difference transparency makes. The experiment involves Legislators proposing and voting on a budget that can be divided among the Legislators and the Public, followed by the Public deciding whether to reelect each Legislator for the next period. The degree of transparency varies across different treatments. Transparency encourages public-serving budgets, universalistic legislative coalitions, and high rates of reelection.

Keywords: representatives, public, transparency, legislative process, experiment, budget.

Resumen: ¿Se comportan de manera diferente nuestros representantes cuando sus acciones pueden ser observadas por los ciudadanos de cuando éstas no lo son? La intuición sugiere que sí, pero la falta de transparencia que se detecta en los procesos legislativos de muchos países entorpece la investigación empírica convencional. Este trabajo presenta los resultados preliminares de un experimento diseñado para estimar precisamente cuánto importa la transparencia. El experimento reúne a cuatro personas, de los cuales tres actúan como legisladores y una como ciudadano. Los primeros formulan y votan un presupuesto y, luego, el segundo decide si reelegir a cada legislador para un siguiente mandato. El nivel de transparencia varía según los procedimientos desarrollados, pero se advierte que la transparencia fomenta presupuestos al servicio del público, coaliciones legislativas universalistas y altos niveles de reelección.

Palabras clave: representantes, ciudadanos, transparencia, procesos legislativos, experimento, presupuesto.



I. Motivation¹

Do legislators behave differently when their actions are observed by citizens from when they are not? Are their proposals and decisions more public-serving when the policy making process is transparent? Many theorists of representation and good-government reformers share an intuition that transparency facilitates monitoring of politicians by citizens and mitigates pursuit of representatives' self-interest at the expense of some broader conception of the public good (Snyder and Ting 2005; O'Connor and Smith 2010; Open.Secrets.org; CongresoVisible.org).

The proposition that transparency can affect democratic performance is attractive normatively as well as theoretically because transparency is low in many legislatures, but it is relatively easy to do something about it. Machines that record votes can be installed at modest costs (Carey 2009). Attendance and voting records can be disseminated to citizens through simple and cheap media (Humphreys and Weinstein 2008). This paper reports preliminary results of an experiment that aims to test the impact of transparency on the extent to which legislative decisions serve the public's interest.

¹ Acknowledgements: Special thanks go to Senate Taka and Wenyu Lu, who reprogrammed the z-Tree software package (licensed gratis by the Institute for Empirical Research in Economics at the University of Zurich) to run the experiments described in this paper. Jaime Combariza and Peter England provided the virtual machine and other elements of the network environment. David Glick and the students in his Introduction to American Politics class served as test pilots of the network and program. Melissa Bearden, Peter Jankovsky, and Gabrielle Ramaiah provided research and logistical assistance.



II. Background

High levels of legislative voting transparency have long been taken for granted in the United States, where individual-level voting records on most important motions in both chambers have been made public since the founding; and for just as long, legislators have expected electoral punishment for voting against their constituents' interests (Odegard 1928; Kile 1948; Skeen 1986; Smith 1989; Bianco, Spence and Wilkerson 1996). The conventional logic in the United States regarding transparency versus anonymity in voting has been that anonymity is necessary for voters, through the secret ballot, in order to free citizens from intimidation in elections, but that transparency in legislative voting enhances democratic accountability. In effect, legislators ought to be subject to pressure on their votes but citizens should not (United States Supreme Court 1958).²

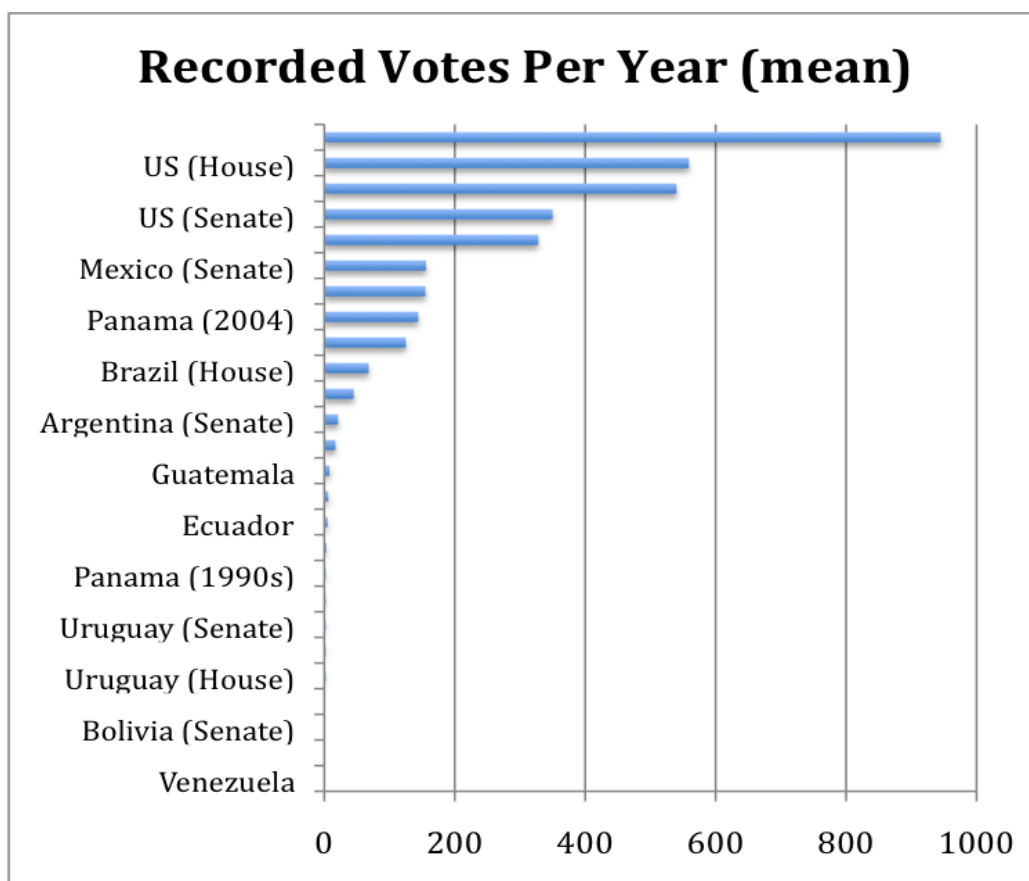
More recently, formal models of legislator-constituent relationships make the case that transparent legislative voting ought to be appealing both to citizens and legislators - to the former because transparency exposes potential betrayals of citizens' interests, and to the latter because transparency makes enforceable commitments to constituent interests, and the rewards that might follow from such commitment, possible (Snyder and Ting 2005; Humphreys and Weinstein 2008).

Until recently, transparency was little explored in the literature on legislatures outside the United States. One can find general claims that voting against constituent interests risks electoral punishment, resting on the assumption that citizens know how their representatives vote (Rose-Ackerman 1999: 127). Yet there is huge variance in transparency across legislatures. Figure 1 shows the incidence of recorded votes from 26 legislative chambers across 16 Latin American countries. In most legislatures, the votes of individual representatives are not recorded on most proposals. In many cases, there is no transparency in legislative voting at all. Research from other parts of the world confirms that the widely variant levels of transparency in Latin American legislative voting are typical in other regions as well (Saalfeld 1995; Hug 2010).

² But see Rousseau (1763), Burke (1774), and Stasavage (2004) for contrary views.



Figure 1. Mean number of recorded votes per year, various national legislatures



Source: Carey 2009, Table 3.3

Recent research documents procedural variation across votes within Latin American legislatures (Carey 2009), strongly suggesting that transparency affects *to whom legislators are accountable*, and relatedly, that legislative decisions on whether or not to make votes transparent are shaped by legislators' desires about which audiences they want to observe their votes (Carrubba, Gabel, and Hug 2008; Crisp and Driscoll 2010).

The literature on legislative voting transparency, then, is partly historical, partly formal, and partly contemporary empirical. All the scholarship shares a belief that transparency matters to how representatives behave. To this point, however, it does not allow a direct test of that proposition, or estimation of how much transparency matters, partly because one cannot compare observable behavior (e.g. recorded votes) with unobservable



behavior (e.g. non-recorded votes), and partly because the votes that are visible are almost certainly not representative of the population of all votes³.

Meanwhile, there is an extensive literature in experimental economics and anthropology on bargaining and cooperation games that bear some resemblance to what goes on in legislatures. This work examines a variety of games in which players are selected either to propose a division of some fixed budget, or to contribute resources to a common pool, and other players must decide whether to accept the proposals. In some variants, responding players may also punish 'selfish' proposers. This scholarship demonstrates that budget proposers are less selfish when they are susceptible to punishment (Fehr and Gächter 2000; Fischbacher et. al. 2001), and also that there is variance across players in different societies about how selfish a proposal must be to warrant punishment (Henrich et. al. 2005, 2006, 2010; Herrmann et. al. 2008).

So far, so good, but this scholarship has been primarily concerned with identifying norms of cooperation, fairness, and selfishness in interactions among individuals, rather than between citizens and representatives, or within representative institutions, and the staple experiments at the heart of this literature -- ultimatum, dictator, and public goods games -- lack key characteristics that would better approximate legislative environments.

A smaller experimental literature examines the predictions of the Baron and Ferejohn (1989) model of budget division by a legislature with three parties (or participants, in the experimental set-up) that are allocated varying voting weights, although any combination of two of the three is necessary to form a majority. The game is generally played with a finite number of periods, and with the proposal power assigned by some fixed rule (e.g. by probabilities corresponding to voting weights), and reassigned if a proposal is rejected. The focus of investigation in these experiments is the division of spoils among the legislators, and the central results is that proposers exploit their advantage less than predicted by the Baron and Ferejohn model, forming fewer

³ Humphreys and Weinstein (2008) describe research in progress in Uganda in which annual 'parliamentary scorecards' -- audits and reports about the activities of legislators produced by a Kampala-based NGO -- are generated for all legislators during the 2007-2011 term, with active dissemination campaigns to deliver the information in the scorecards are conducted in some legislators' districts, but not in others. This agenda promises a quantum leap in measuring how the transmission of information to citizens affects legislative behavior, but the scorecards will focus on indicators of legislators' efforts (attendance, motions introduced, speeches, etc.) rather than specific information about legislative decision-making precisely because votes are not recorded in Uganda (p.27).



minimum-winning and more universal coalitions, and dividing the budget more equally with coalition partners, than the non-cooperative model would anticipate (Diermeier and Morton 2003; Fréchette, Kagel, and Lehrer 2003; Fréchette, Kagel, and Morelli 2005a, 2005b).

The experiment I report on here varies these bargaining games in a couple of simple ways that aim to simulate the monitoring of representatives by citizens. The goal is to shed light on the extent to which transparency affects how public-serving budgets are, and the ability and inclination of the public to reward and punish individual legislators. The experiment also aims to determine whether the public has a preference between minimal versus universalistic coalitions.

III. The Experiment

The experiment is a game played among four actors - three legislators and the public. It involves a proposal for division of a budget by one legislator, then a vote on the proposal, then budget payouts (conditional on its approval), and finally an opportunity for the public to reward or punish each legislator. The treatments manipulate what information regarding the identify of the proposer, the nature of the proposal, and the legislators' votes are observable by the citizen.

The full set of instructions and associated documents that were provided to each participant before the experiment are included in the Appendix. Here, I review the key pieces of information about the experimental set-up and procedure.

Environment

- The experiments were conducted in a computer lab on the campus of Dartmouth College during late July and early August, 2010.
- The lab consisted of 10 networked computers running z-Tree experimental software (Fischbacher 2007), specially adapted to run the game. The lab provided for a divider to separate the Public from the Legislators, but the Legislators were seated in two rows of computer terminals.



- Participants were recruited overwhelmingly from among Dartmouth's undergraduate student population (92%) with a handful of students from other institutions (4%) and Dartmouth staff and faculty (4%). Participants were guaranteed a \$10 participation fee, plus whatever profit they made from the budget game, paid in cash at the end of the experiment.
- Each experiment involved 10 participants and consisted of 20 periods of play, all in the same transparency mode -- i.e. non-transparency, semi-transparency, or full transparency (explained below).⁴
- A budget of 24 units was divided in each period. Each unit was worth \$.50, such that \$12 was on the table in each period, and \$240 was at stake across the full 20 periods.

Players and Preparation

1. All participants are informed under what transparency conditions the game will be played -- Non-Transparency, Semi-Transparency, or Full Transparency (explained below).
2. 1 of the 10 participants is drawn at random to act as the Public. 9 are Legislators (L1, L2, L3, ... L9).
3. The computer selects 3 of the 9 Legislators to be active in Period 1.

Sequence of Play in Each Period

1. Of the 3 active Legislators, the computer selects 1 to be the Proposer in Period 1.
2. The Proposer is prompted to divide a budget of 24 units⁵ among any combination of the 4 active players (e.g. L1, L6, L8, and Public).

⁴ Budget constraints limited me to conducting just 3 experiments in each mode, so the numbers of participants and observations are small and the results preliminary. Pending access to grant support and refinements of the experiment and method, the goal is to conduct experiments on a larger scale and with a more diverse participant pool.

⁵ The stake of 24 budget units is convenient because it is divisible both by the total number of players, and by the number of active Legislators (or by a minimum coalition of Legislators plus the Public), so is amenable to various potentially focal distributions while also allowing flexibility for unequal divisions across players.



3. The active Legislators observe the proposal and vote to approve or reject it. (Non-active Legislators also observe the proposal, but do not vote.)
 - If a majority approves, the budget is paid out according to the proposal.
 - If a majority disapproves, no payouts are made.

4. Public is informed whether the budget was approved or rejected, plus under:

Non-Transparency (NT)

- her own payout.

Semi-Transparency (ST)

- her own payout; and
- the identity of the Proposer (e.g. L6).

Full Transparency (FT)

- her own payout;
- the identity of the Proposer;
- how much the proposed budget offered to each Legislator; and
- how each Legislator voted (Approve/Reject) on the budget proposal.

5. [Except in the 20th and final period, ...] the Public 'reelects' or rejects each Legislator for the following period. Any Legislator the Public rejects is replaced with one drawn at random from the pool of 6 non-active Legislators.⁶

After all 20 periods are completed, each participant is shown a screen recapping her or his status (active or non-active) and profit from each period, as well as total profit from the experiment. These numbers are then confirmed with experiment personnel, and participants are paid their profit plus a \$10 participation fee.

IV. The transparency conditions

It is worth saying a few words about what the experimental manipulation of transparency seeks to approximate. Full transparency mirrors the availability of information on most consequential votes in the U.S. Congress, where bill sponsors,

⁶ Rejected Legislators are eligible to be drawn from the non-active pool in future periods, but cannot be drawn to return in the period immediately following rejection.



party leaders, and floor managers, in amalgamation, are analogous to the Proposer, and where roll call voting records expose every legislator to demands from actors outside the legislative chamber to justify his or her vote.

Semi-transparency is analogous to legislative decision-making without the comprehensive transmission of information that characterizes the U.S Congress, but in the presence of effective legislative parties. That is, even where votes are not recorded and published at the individual level, party leaders generally make their parties' positions known on important proposals before legislatures. Where parties are the main vehicles of policy initiatives, and legislators from the same party vote in concert, then knowing what initiatives party leaders advance or oppose provides citizens with reliable information about how their representatives behave. In the context of this experiment, for the Public to know what s/he got and who the proposer was, as under semi-transparency, is akin to knowing which party championed a policy in political system with strong parties.

Non-transparency is a closer approximation of the legislative process where the full transmission of information is absent and parties are ineffective, either because they are not the main source policy proposals or because legislative co-partisans do not reliably vote in unison, or both. For example, in most Latin American systems, the most important legislative proposals issue directly from the executive branch rather than being formally introduced by specific legislators or parties (Crisp and Driscoll 2010; Morgenstern 2003; Siavelis 2000). Where the president has clear ties to a legislative party, executive initiatives might reasonably be attributed to that party, but in many presidential systems these ties are loose or even non-existent. Presidents' parties are often factionalized precisely by the different demands of competition in executive versus legislative elections (Samuels 2002). Many presidents rely on non-partisan or coalition cabinets, or reject traditional party labels altogether (Linz 1994; Cox and Morgenstern 2001). Under these circumstances, connections between policy proposals and any proposer inside the legislature itself can be obscure. Moreover, when party unity in legislative voting is low, as is often the case in presidential systems, failure to provide a recorded vote can render responsibility for legislative decisions thoroughly opaque (Carey 2009). In short, in many Latin American polities (and I suspect others as well), citizens often find themselves effectively in the experiment's non-transparency mode; they know what they got, but not much else about where it came from.



V. Expectations

The experiment aims to shed light whether transparency affects two general types of outcomes:

- the extent to which budgets serve the Public relative to the Legislators; and
- budget divisions among the Legislators themselves.

The fundamental theoretical expectation is that transparency should make the threat of electoral punishment of Legislators by the Public more effective, so should generate more Public-serving budgets. Specifically:

H1: The higher transparency, the greater the Public's share of budgets.

There are two ways this might come about, which I refer to as first-order and second-order accountability. The former operates through Proposers' budget offers to the Public (POs), as a result of Proposers' fear of electoral punishment, and should manifest itself under both ST and FT -- that is, when the proposer is visible to the Public -- but not under NT:

H2: POs should be higher under ST and FT than under NT.

What I call second-order accountability operates through non-Proposer Legislators' desire to be seen as voting for Public-serving budgets and against budgets that ill-serve the Public when votes are visible, so should manifest itself only under FT:

H3: Budget votes by non-Proposer Legislators should be positively correlated with POs under FT, but not under NT or ST.

Prior expectations regarding whether and how transparency should affect budget divisions among Legislators are more ambiguous. Previous research on budget division games focuses on the magnitude of the Proposers' advantage and, more generally, whether budget divisions are minimal (paying off the smallest number of legislators necessary to approve a budget) or universalistic. Incorporating a Public and a reelection round in this experiment, coupled with the transparency manipulations, means that if the Public has preferences about the inclusiveness of legislative coalitions, then the



Public's ability to observe the details of budget proposals could affect their inclusiveness.

There are two ways to think about Public preferences over inclusiveness. In principle, minimal coalitions should be less expensive in terms of payments to Legislators, leaving more resources for the Public, so we might expect the Public to reward minimal coalitions -- perhaps inferring that her own budget share is larger than it might have been had the legislative coalition been universalistic. On the other hand, results from experimental budget division games indicate that players subscribe to norms of universalism to a greater degree than non-cooperative game theoretical models would suggest (Diermeier and Morton 2003).

In short, previous experimental research suggests (although this is a weak expectation) that the Public prefers universalistic coalitions to minimal ones. If this is the case, then we should observe an effect on legislative behavior only when the Public can see legislative proposals:

H4: Under FT, legislative coalitions should be more universalistic than under NT or ST.

VI. Results

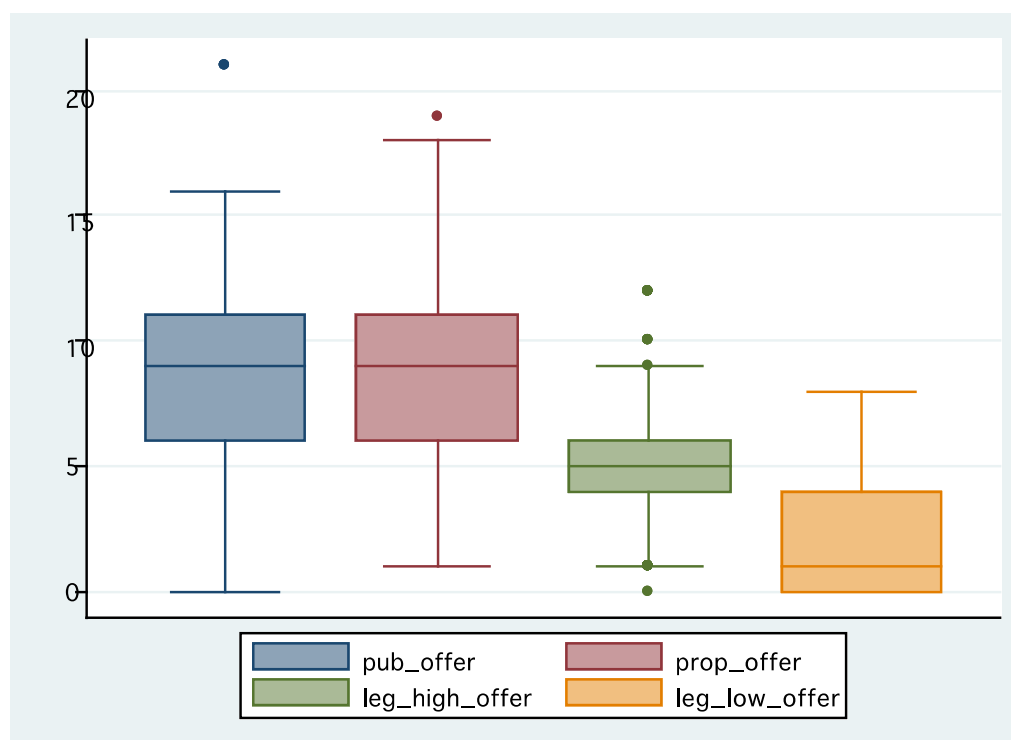
Before considering the results regarding how budgets are divided, note that almost no budget proposals were rejected by majority vote during the experiments conducted thus far. With 3 sets of experiments conducted in each mode, and 20 periods per experiment, we have 60 budget proposals per mode, and 180 overall. Of these, only 5 (<3%) failed - 2 in NT mode, 0 in ST, and 3 in FT. I return to the implications of the overwhelming budget approval rate in the Discussion section, below. For now, the important point is that the characteristics of *budget proposals* and *approved budgets* are extremely similar in all modes. Out of expediency, therefore, my default will be to present data on the complete set of budget proposals, and not present parallel data on budget outcomes.



VI. 1. How are budgets divided?

Overall, budget divisions tend to favor the Public and the Proposer, with the former averaging just over 8 units per period and the latter just under 9, while the high offer to non-Proposer Legislators averaged just over 5 and the low offer just below 2.⁷ 47% of budget proposals were minimum-winning, offering some positive amount to the High Legislator and 0 to the Low Legislator.

Figure 2. *Offers to Public, Proposer, High and Low Legislators - All Modes*



Because I am particularly interested in how budgets serve the Public, and in the conditions that trigger the Public to punish Legislators electorally, it is worth looking at the distribution of POs. Figure 3 shows that the most frequent POs are at 0, 8, 10, and 12 budget units, with a density in the range around 10, lesser density in the 2-7 range, and offers above 12 are rare.

⁷ Graphs will generally distinguish between the Public's offer, the Proposer's offer, and the High and Low offers made to non-proposer Legislators.



Figure 3. *Distribution of Public's offers (POs) - All Modes*

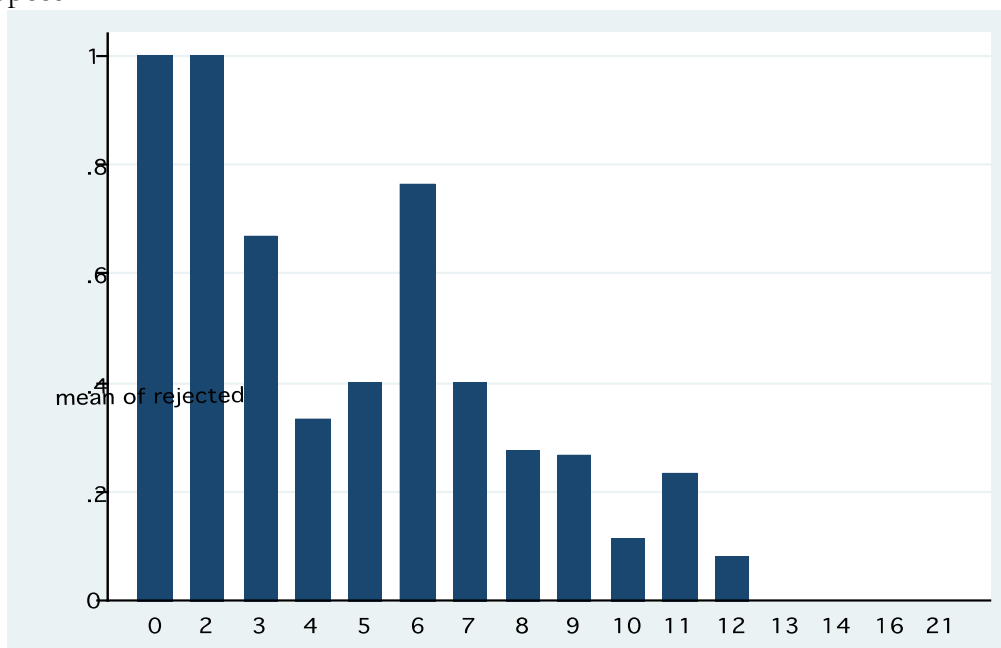


VI. 2. What does the Public reward/punish?

Figure 4 shows the probability that Legislators are rejected (i.e. not reelected) for the subsequent period, by the budget offer to the Public, with the top panel showing the probability for Proposers and the bottom for non-Proposer legislators.

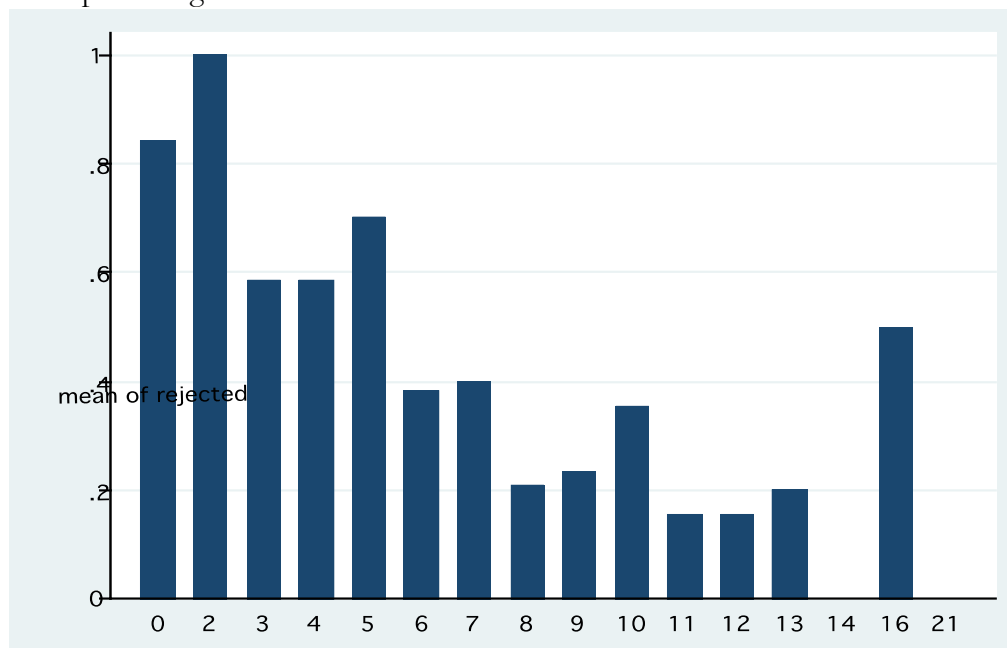
Figure 4. *Probability Legislators are rejected for next period, by Public's budget offer - All modes*

Proposer





Non-Proposer Legislators



As one would expect, the probabilities generally decline as the Public's offer (PO) rises in both cases. The notable discrepancy is at PO=6, which triggered Proposers to be rejected nearly 80% of the time, whereas POs = 4 or 5 prompted much lower rejection rates. This is likely a product of the relatively few runs of the experiment conducted to date. The low rejection rates at PO = 3 or 4 are based on only a handful of observations, and the high rate at PO=6 is based on only 11. The rejection rates in the PO = 0 and in the 8-12 range, by contrast are based on many more offers.

That said, PO=6 does appear to be an inflection point for the probability of electoral punishment. For Proposers, $PO \leq 6$ triggered rejection 71% of the time, whereas $PO > 6$ triggered rejection only 16% of the time. Non-Proposers were only minimally insulated from retribution, with rejection at 61% when $PO \leq 6$, and at 21% when $PO > 6$.

VI. 3. What do Legislators approve/reject?

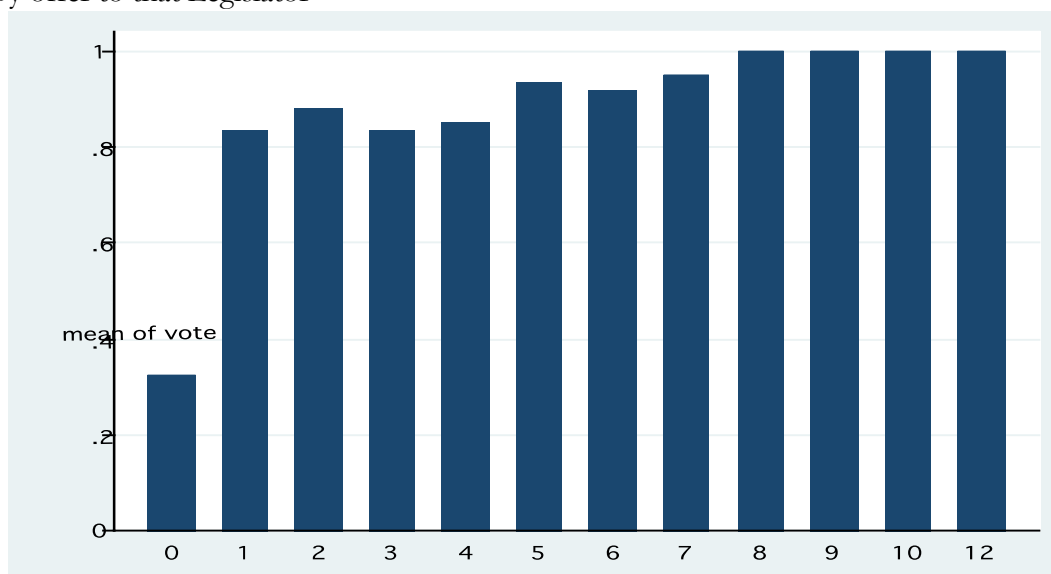
Figure 5 shows the probability a non-Proposer Legislator votes to approve a proposed budget, by the budget's offer to that legislator (top panel) and by the PO (bottom panel). The top panel shows that, apart from when they receive zero offers, legislators overwhelmingly vote Yes, which accounts for the near absence of failed budgets. Even zero offers elicit positive votes over 1/3 of the time, suggesting that legislators are generally unwilling to jeopardize the success of budgets.



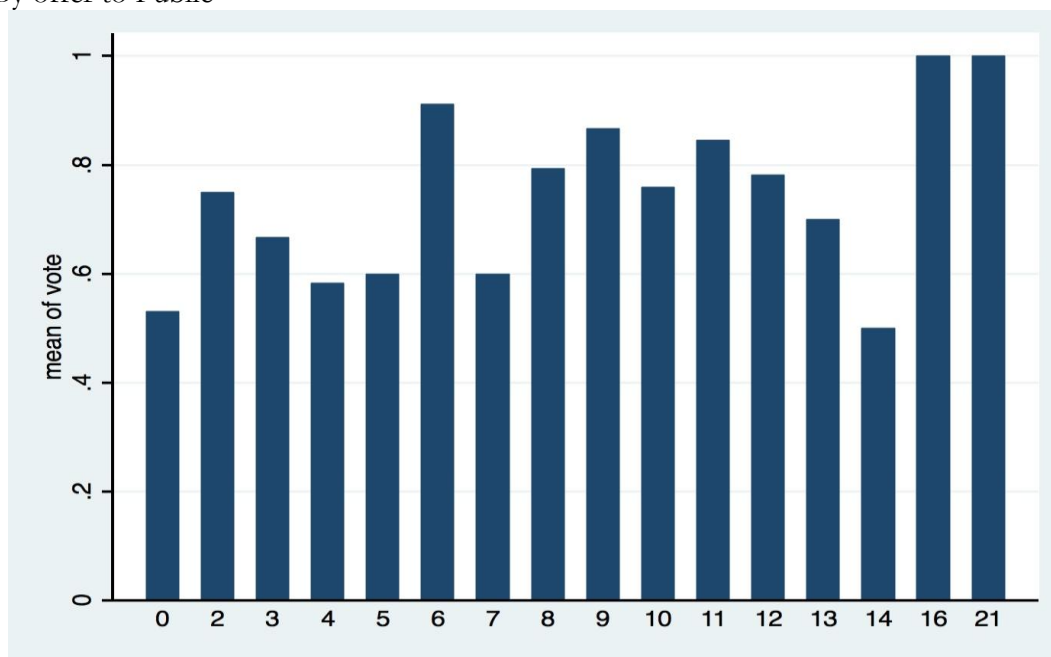
The bottom panel shows no clear relationship between POs and the budget votes of non-Proposer Legislators. More than 2/3 of all Nay votes on budgets were cast by Legislators who received zero offers. The POs associated with those offers were widely distributed, but it was the offers to the Legislators that overwhelmingly drove their decisions to cast Nay votes.

Figure 5. *Probability non-Proposer Legislator votes to approve budget - All modes*

By offer to that Legislator



By offer to Public



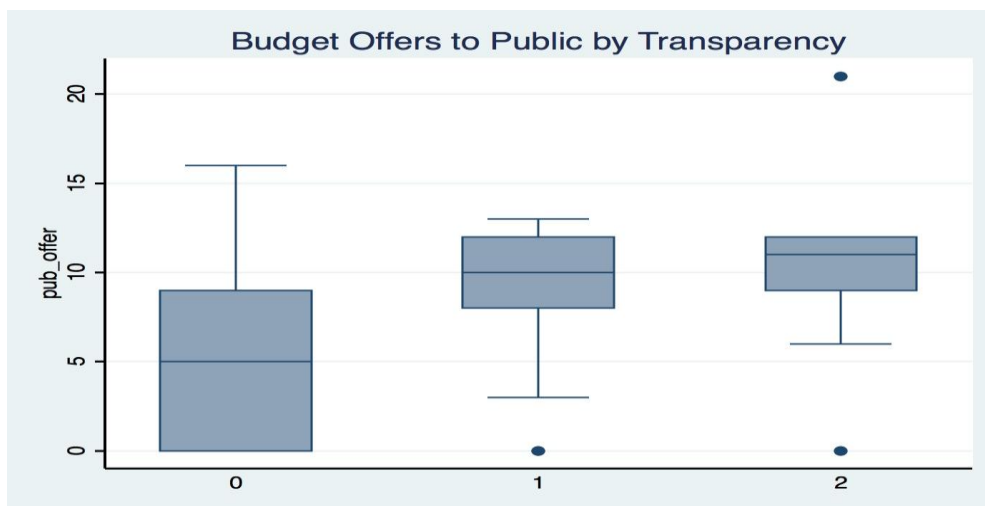


VI. 4. How does transparency affect how each type of player fares?

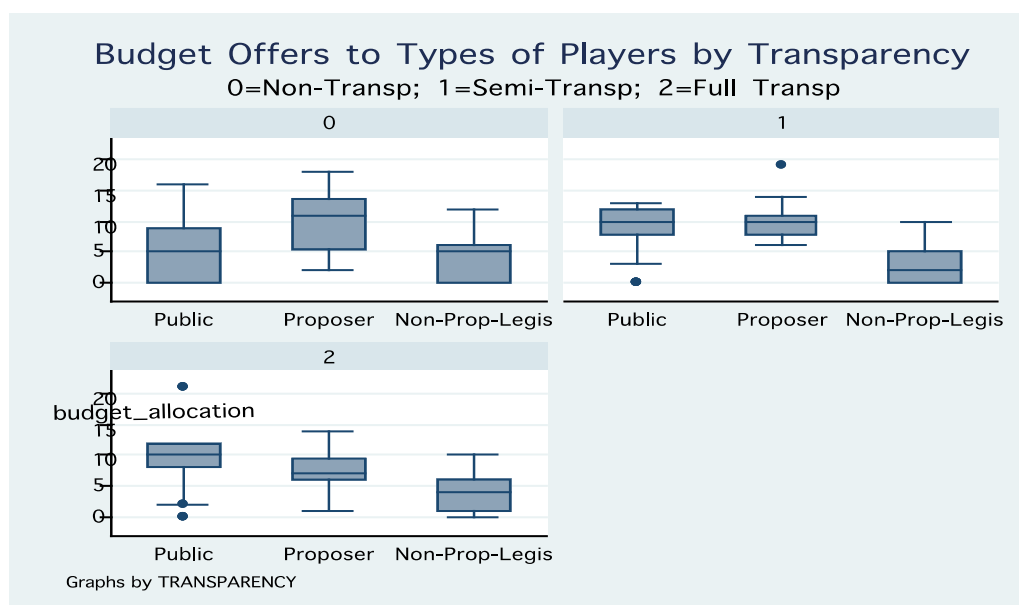
The central result of these experiments is that transparency matters to the relative distribution of the budget among players. Figure 6 illustrates the distribution of budget offers to the Public, the Proposer, and to non-Proposer Legislators, under each of the transparency conditions. The top panel separates out the POs, which are the main point of interest, and for which differences across transparency modes are most dramatic. The second panel includes offers to Proposers and non-Proposer Legislators as well.

Figure 6. *Distribution of offers to Public, Proposer, and non-Proposer Legislators, by Transparency*

Public



Public, Proposer, and Non-Proposers



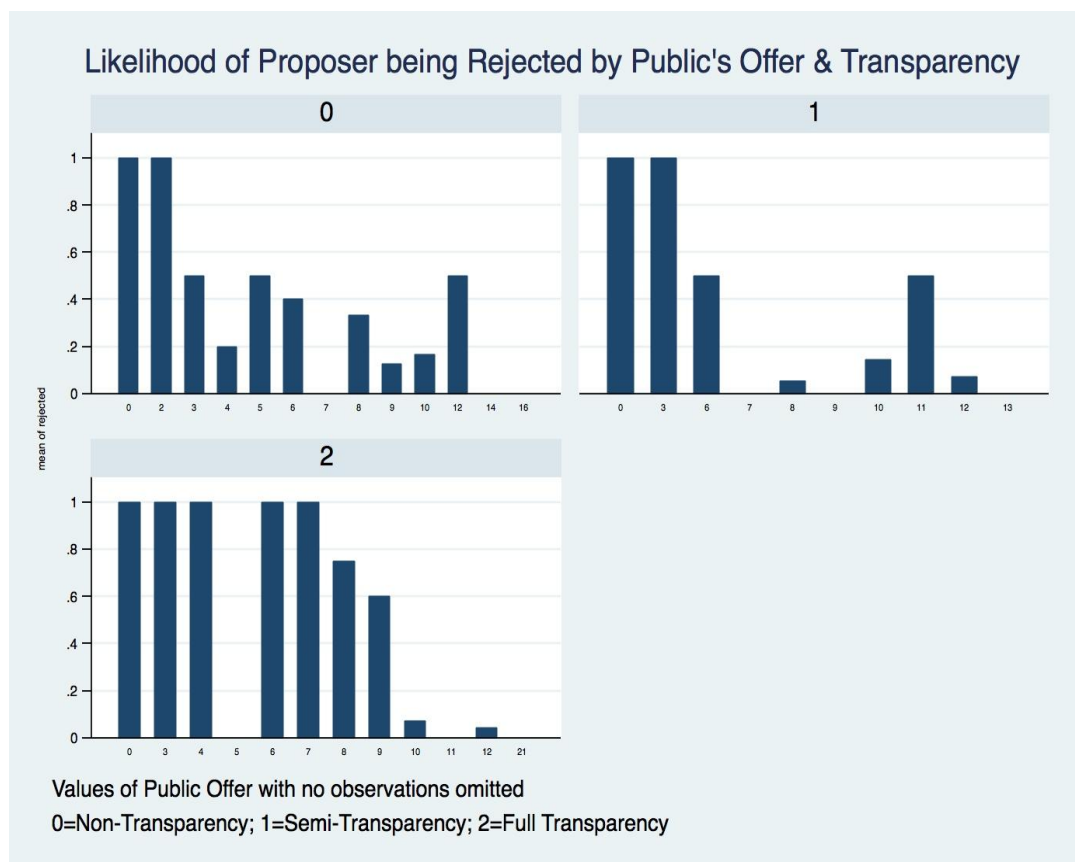


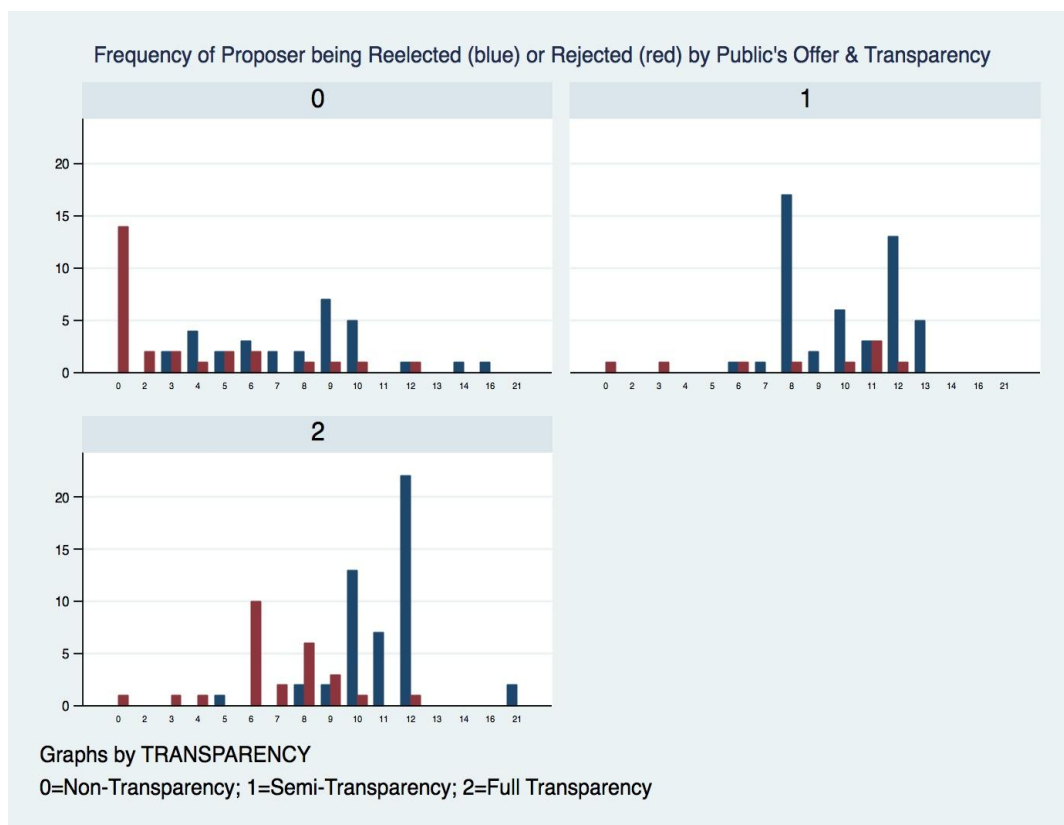
The first lesson is that, consistent with H1 and H2, transparency is the Public's friend. The mean PO is 5.2, 9.3, and 10.3 under NT, ST, and FT conditions, respectively. Conversely, transparency (or at least the full version) appears to work against Proposers. Mean Proposer's offers are 10.0, 9.7, and 7.5 under NT, ST, and FT, respectively. Non-proposer Legislators, do best under NT (mean high = 6.7, mean low = 2.2), then FT (high=4.5, low=1.8), and worst under ST (4.3 and 0.7).

VI. 5. First-order accountability: Proposers and bad budget offers

We have seen that Proposers pay an electoral price for offering the Public too little. Figure 7 shows that this relationship grows starker with transparency. The top panel shows the rates at which Proposers are thrown out of office, given their PO, under each transparency mode, whereas the bottom panel shows the frequency of reelection/rejection under each condition. (The frequency graphs are noisier, but convey information about the number of observations at each PO interval.)

Figure 7. *Rate of Proposers rejected, by Public Offer and Transparency*





Very low POs are a death wish for Proposers under all transparency modes, but under NT, Proposers do not appear to benefit electorally from generosity to the Public in the whole PO range from 3-12. This is likely because the Public cannot definitively identify the Proposer under NT, and Publics evidently showed occasional hesitation to fire all three Legislators even after receiving fairly low POs in some periods. By contrast, punishment of Proposers who low-balled the Public was more regular in both ST and FT modes, where the identity of the Proposer was revealed. That said, in ST and FT modes, low POs were rarely observed (bottom panel) as Proposers, anticipating punishment, offered far more Public-serving budgets.

VI. 6. Second-order accountability: Non-proposers and bad budgets

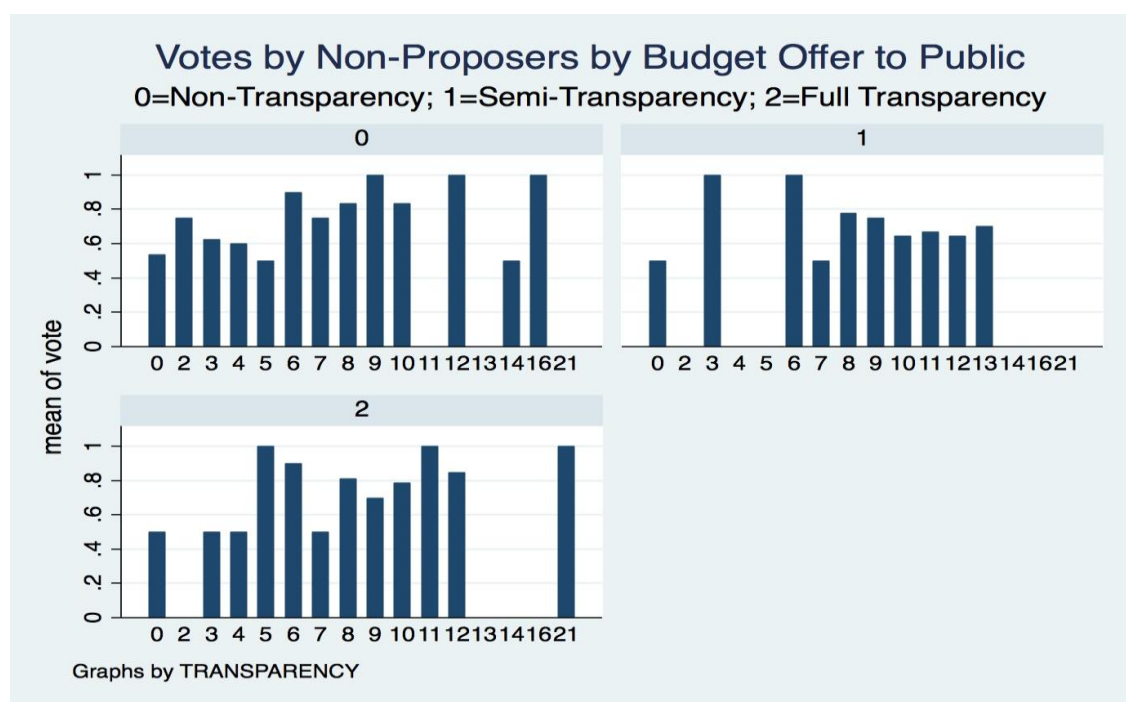
Proposers catered to the Public far more assiduously when they were visible. But what about non-Proposer Legislators? Part of the logic of the treatment conditions is to expose the non-Proposers to possible electoral sanction for voting for budgets that serve the Public poorly (or voting against ones that serve the Public well).



Under NT or ST, non-Proposers are anonymous, so we might expect their voting decisions to be driven exclusively by how well the budget offer treats them. Recall that if a proposed budget fails, all players receive nothing. Under NT, non-Proposers have no reason to vote against a budget that serves the Public poorly because even causing such a budget to fail delivers zero to the Public, while all legislators -- Proposer and non-Proposers alike -- are indistinguishable to the Public. Assuming the Public will punish a failed budget (and zero pay-off) by rejecting the team of legislators that engineered it, there is no reason for non-Proposers to vote against budgets under NT. Under ST, the Public can distinguish the non-Proposers from the Proposer, but does not see individual votes (or the offers, other than the PO), so has limited ability to reward good legislative behavior beyond the proposal.

FT, by contrast, is designed to confront non-Proposers facing budgets that serve the Public poorly (and in doing so, that may serve themselves well) with the dilemma that approving 'bad' budgets may invite electoral punishment. Is there evidence that such budgets put non-Proposers in a tough spot, or that the Public delivers punishment along these lines? Figure 8 shows the rate at which non-Proposers voted to approve proposed budgets, by the PO, with a separate graph for each transparency condition.

Figure 8. *Probability of non-Proposer approving a budget proposal, by Public's Offer and Transparency*





If FT exerts strong pressure on non-Proposers to guard the Public's interest, then we should observe an increasing probability of 'Aye' votes as we move from left to right across the FT (bottom)panel, but not in the NT or ST (top two) panels of the figure. This pattern is definitely more pronounced in FT than in ST, although the contrast is not so clear relative to NT. In any case, the raw rates of 'Aye' votes is a rough measure of accountability, both because we know the offers to the Legislators themselves also affect likelihood of voting 'Aye,' and because the number of budget proposals at each interval of PO varies.

A more precise estimate of the effect of transparency on non-Proposer votes follows from comparing logit regressions of:

$$\text{Pr}(\text{Vote}=1) = a(\text{Constant}) + b_1(\text{Legislator's Budget Offer}) + b_2(\text{PO}).$$

Under the various transparency conditions. Table 1 shows the coefficients and standard errors for the variables of interest in these three separate regressions, along with the estimated change in the likelihood of a Yes vote from shifting each independent variable from its 20th percentile value to its 80th percentile value, with other variables in the equation held constant at their mean values.⁸

Table 1. *Logistic regressions of votes of non-Proposer Legislators on proposed budgets, by their own budget offers, and POs, by transparency conditions. (N=114 in each case.)*

	Non-Transparency		Semi-Transparency		Full Transparency	
	Coefficient (Std. Error)	20th→80th	Coefficient (Std. Error)	20th→80th	Coefficient (Std.Error)	20th→80th
Legislator's Budget Offer	.72 (.13)	+72% (9%)	1.65 (.40)	+69% (7%)	.41 (.14)	+19% (6%)
Public's Offer	.30 (.09)	+39% (13%)	-.16 (.14)	-2% (3%)	.38 (.14)	+12% (5%)

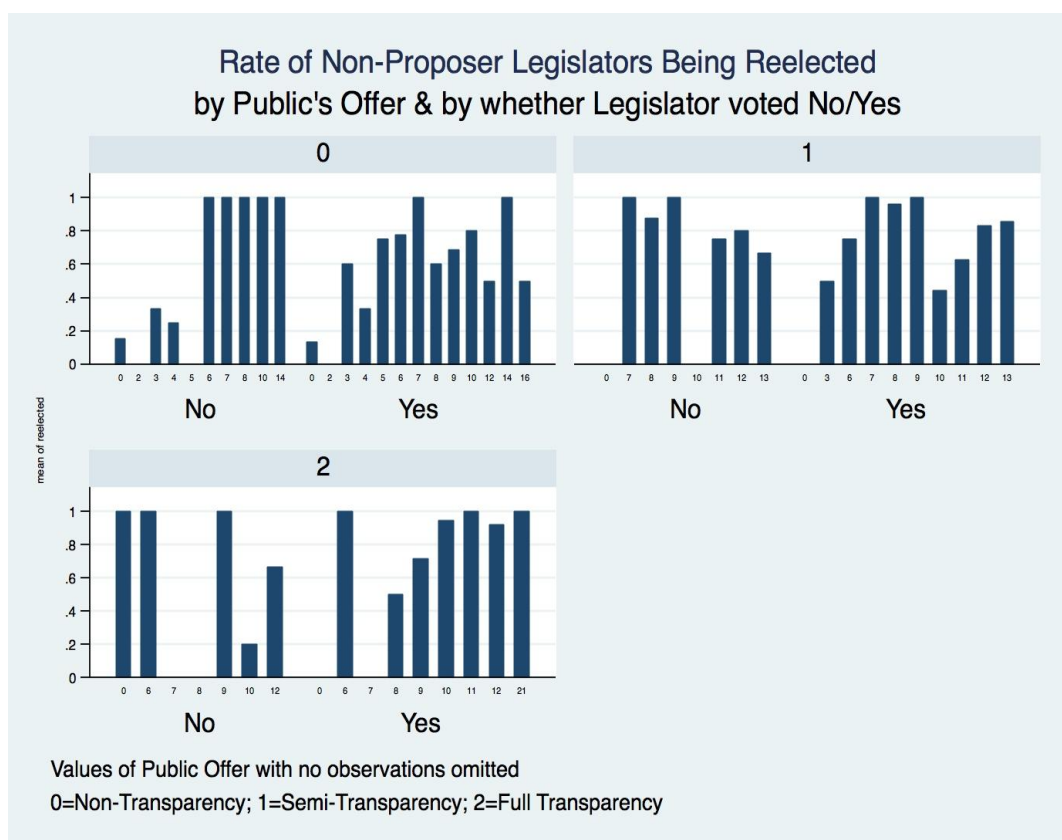
⁸ Budget votes from the last period of each 20-period experiment are dropped because no threat of electoral punishment exists in last periods. I discuss last-period effects below.

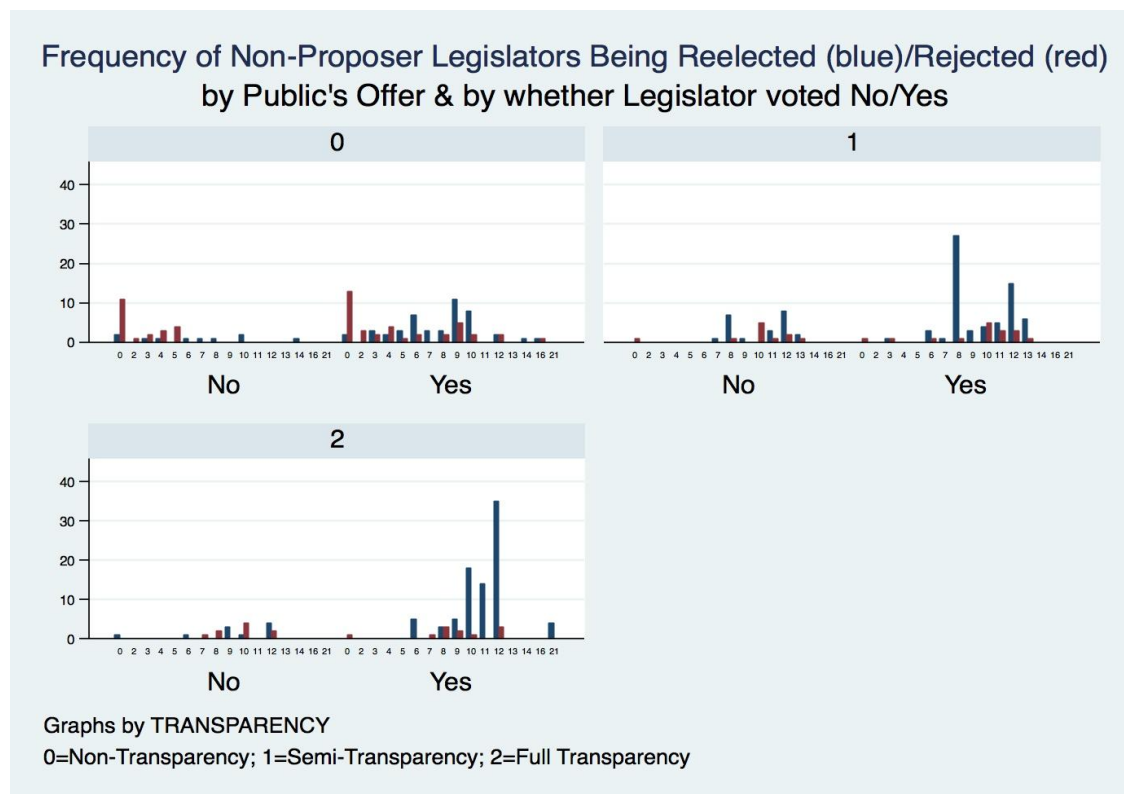


It comes as no surprise that raising a legislator's budget offer increases her propensity to support that budget under all transparency conditions. The effect is weakest by far, however, under FT. By contrast, raising the PO had no effect on a Legislator's likelihood of supporting the budget under ST, but raised it under both NT and FT. The FT result, and the corresponding non-effect of POs under ST, are consistent with H3 and with the idea of second-order accountability under FT. The estimated positive effect of the PO on Legislators' votes under NT, by contrast, is unexpected and puzzling. It may be an idiosyncrasy that would disappear with a larger subject pool and more repetitions of the experiment, but for now it remains unexplained.

Finally, Figure 9 presents data on whether the Public exacts retribution on non-Proposer Legislators according to their budget votes at various levels of PO. In each panel, there are three graphs (one for each transparency condition), each divided according to whether the Legislator voted No or Yes on the budget proposal. The POs are shown along the X-axes.

Figure 9. *Electoral punishment of non-Proposers by Public Offer, Vote, and Transparency*





The graphs in the top panel show the rate at which the Legislators were reelected in each contingency. If the Public is monitoring Legislators' votes and rewarding or punishing accordingly, then under FT, we should see:

- high reelection rates among Legislators who vote No on low-PO budgets;
- rates declining among No-voters as POs rise;
- low rates among Legislators who vote Yes on low-PO budgets; and
- rates rising among Yes-voters as POs rise.

We should not expect to see such patterns under NT and ST because individual Legislators votes are not visible to the Public.

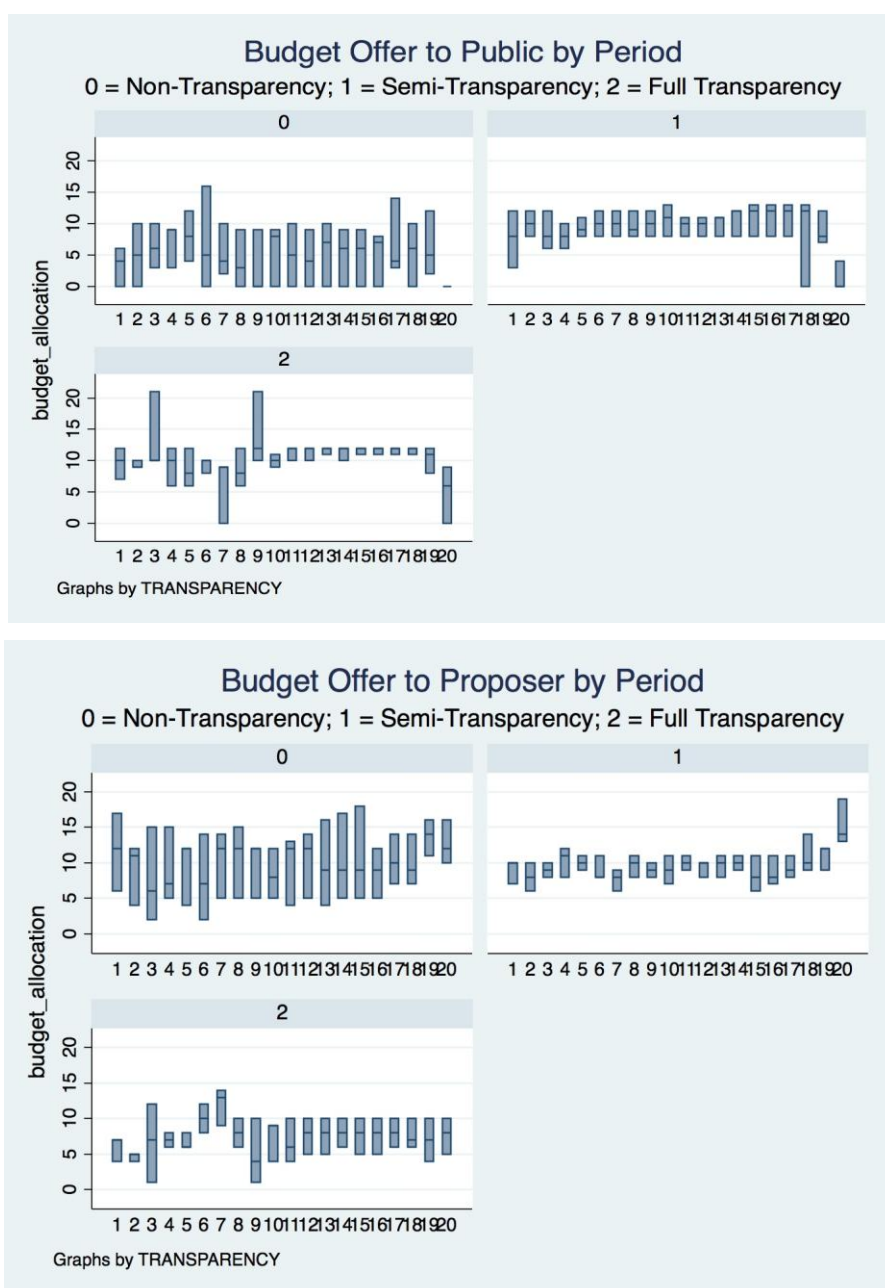
The results in the top panel of Figure 9 are suggestive, but far from determinative. A central obstacle to analysis is that the distributions of POs vary starkly across transparency modes, as one can see in the bottom panel, which shows the frequency of each contingency, rather than the rate of reelection at each. There are plenty of low POs in NT mode, but very few in FT -- precisely when they would present the greatest conundrum to non-Proposer Legislators.

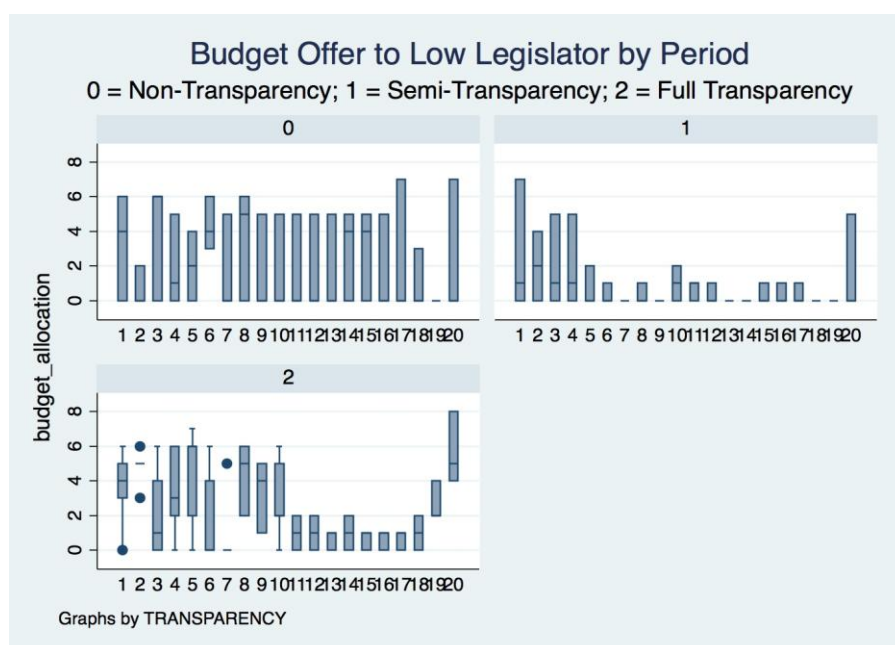
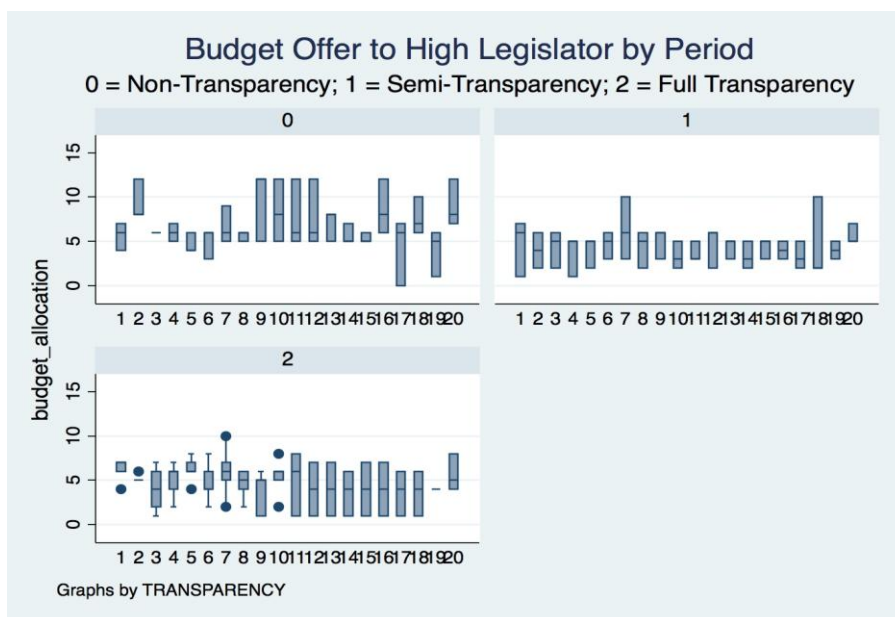


VI. 7. Patterns and learning across periods

Anticipation of electoral punishment by Proposers, encompassed in their offers, develops over periods of the game at different rates and to different levels, according to transparency. The boxplots in Figure 10 show the distribution of offers to the Public, Proposer, High, and Low Legislators, across all 20 periods of play, under NT, ST, and FT.

Figure 8. *Distribution of offers to Public, Proposer, High and Low Legislators, across periods, by transparency*





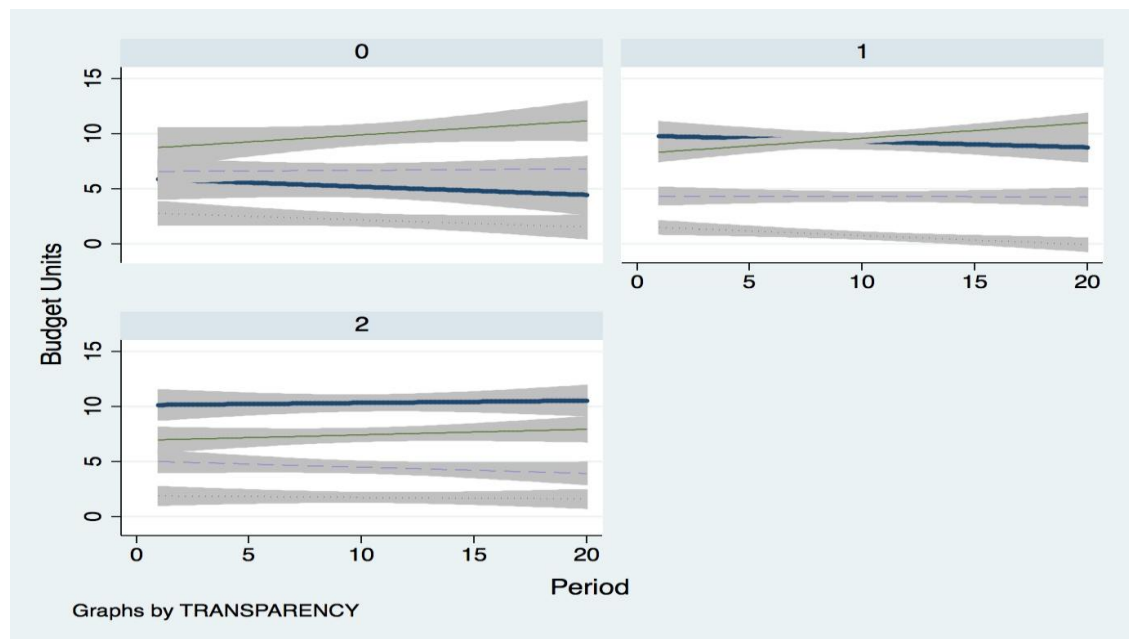
Note the more pronounced variance in offers under NT than under ST or FT. POs, for example, varied widely between zero and about 10, and the spread does not diminish as players proceed through the periods. Under ST and FT, by contrast, initial periods are marked by more varying POs than are later periods, where Proposers tended to settle into more stable patterns (until the final period, that is, where the prospect of electoral punishment disappears and POs drop off precipitously under all modes). Proposers' offers, similarly, vary much more widely under NT than ST or FT.

Figure 11 shows a linear estimation of expected offers to each of the four players across all 20 periods, with a separate graph for each transparency condition.



Figure 11. *Linear estimation (with 90% C.I.) of offers to each type of player across periods, by transparency*

Public: Thick Blue
 Proposer: Thin Green
 High Leg: Dashed
 Low Leg: Dotted



Under NT, the Proposer's expected offer is higher than the PO at the outset, and the expected offers diverge from there, with the Proposer's increasing across periods and the PO decreasing, finishing even below the high non-Proposer Legislator. Under ST, both the Proposer and Public do substantially better than the non-Proposer Legislators, but the trajectory of increasing Proposer offers and decreasing POs is similar to NT (although the confidence intervals overlap). By contrast, under FT, the PO starts higher than any other offers, by a statistically discernible amount, and it the Public maintains that advantage over time.

Transparency, in short, may be an even greater friend to the Public than the aggregate results from the 20-period game suggest, insofar as both the NT and ST graphs suggest that as time horizons stretch, the Proposer's expected share grows relative to the Public's, whereas under FT, the Public's initial advantage appears stable.



VI. 8. Minimum coalitions versus universalism

Beyond effects on the Public, Figure 11 (above) also suggests that the budgetary fates of non-Proposer Legislators differ across transparency modes, with the High Legislator doing best under NT and the Low Legislator doing worst under ST. Among the three legislators as a group, FT appears to minimize inequality. I measure the distributive effects among Legislators of transparency in two different ways:

- the incidence of minimum coalitions; and
- standard deviation of offers to (Proposer, High Legislator, Low Legislator) from each period.

The differences are summarized in Table 2.

Table 2. *Distribution of budget benefits across Legislators*

	Non- Transparency	Semi- Transparency	Full Transparency
% Minimum Coalitions	53	67	26
Variance Legislators' Offers	4.3	4.7	2.8

The proportion of minimum coalitions -- those that offer zero budget units to one legislator -- is more than double under NT and ST than under FT. Correspondingly, the average variance across Legislators' offers is substantially higher under NT and ST than under FT. Consistent with H4, when the details of budget offers are not visible to the Public, as under NT or ST, Proposers were far more inclined to form minimum coalitions, and were less egalitarian in their distributions across coalition partners, than when the details of budget offers were fully visible, under FT.

Proposers' reluctance to play budget hardball under FT is consistent with the proposition that the Public prefers universalism and will reward it (and punish minimal coalitions) when offers are visible. The data from these experiments, however, do not show the Public administering such electoral sanctions. Logit regression of:

$$\text{Pr(Reelected)} = a(\text{Constant}) + b_1(\text{PO}) + b_2(\text{Minimum Coalition})$$

For all Proposers in FT shows, as expected, that high POs are rewarded, but the estimated effect of minimum coalitions (or, alternatively, variance among Legislators's

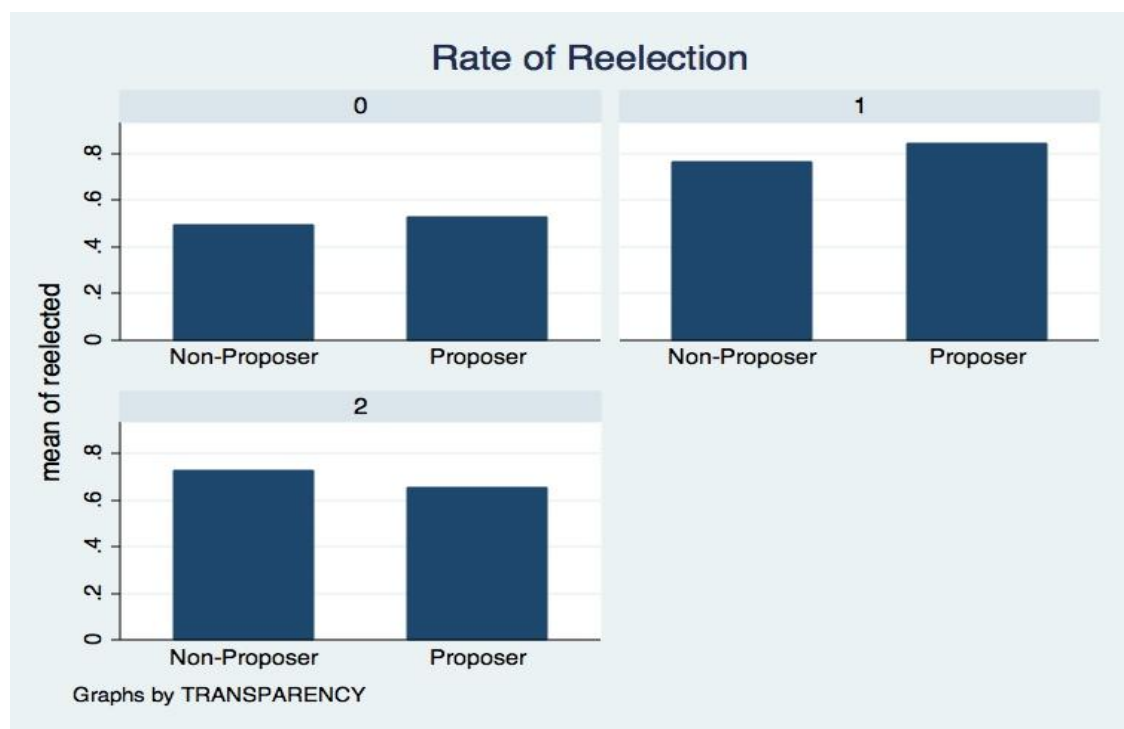


offers) is indistinguishable from zero. So Proposers appear to have anticipated Public sanction for self-serving offers under FT and adapted their behavior accordingly, but the results to date do not indicate whether these anticipations were warranted.

VI. 9. Reelection rates

We have seen (Figs. 4, 7, 9) data on the rates of reelection/rejection of Legislators by the Public contingent on POs and Legislators' votes. We also know that the distributions of POs and Legislators votes depend on transparency conditions. The product, illustrated in Figure 12, is that overall rates of reelection, for Proposers and for non-Proposer Legislators alike, vary substantially by transparency mode.

Figure 9. *Reelection rates among Proposers and non-Proposer Legislators, by Transparency*



The most striking difference is the lower reelection rates in both categories under NT than under ST or FT. Both Proposers and non-Proposers are thrown out of office more than twice as frequently under NT than under either ST or FT. The experiment establishes electoral sanction as the Public's only tool for eliciting good behavior among Legislators, and the Public demonstrably uses this tool much more often under NT than in the other modes, but to far less effect, judging from the Public's budget shares under each mode.



Transparency makes electoral sanction is more effective, which in turn minimizes the need for it to be exercised, consistent with the general results from formal models of transparency and legislative responsiveness (Ting and Snyder 2005; Humphreys and Weinstein 2008), but contrary to conventional wisdom that often equates high rates of reelection with insulation of legislators from public sentiment (cites).

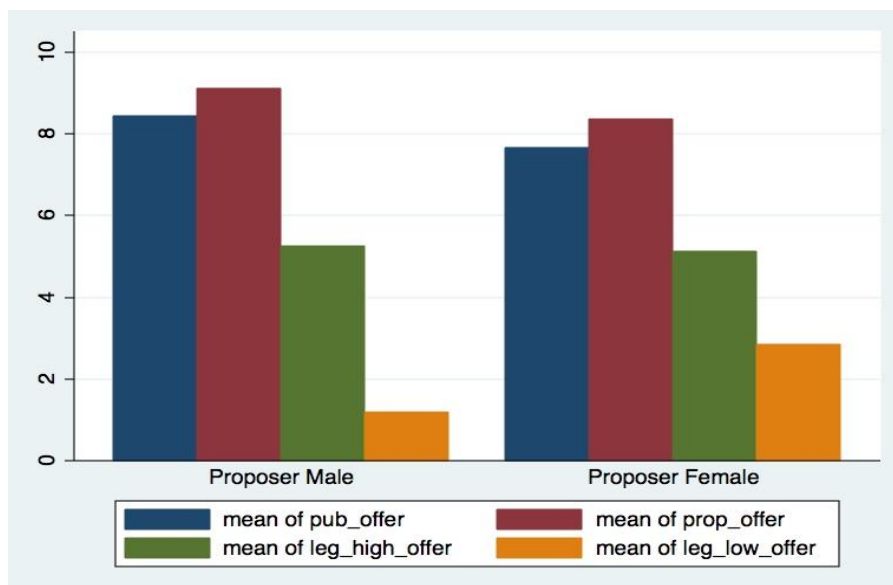
VII. Characteristics of Proposers

Experiment participants filled in brief surveys that provide at least three pieces of personal information potentially relevant to their behavior: sex, citizenship, and (given that the participants in this preliminary set of experiments were overwhelmingly undergraduate students) academic discipline. Although the analysis up to now has not explored the effects of these characteristics, I summarize here a few differences -- and non-differences -- by demographics.

VII. 1. Sex

Male and female Proposers are about the same in their offers to the Public, but female proposers are more universalistic in their budget offers among Legislators. Figure 13 shows mean budget offers to each type of participant, by Proposer sex.

Figure 10. *Mean budget offers to each type of player, by Proposer's sex*





Budget proposals were far more equitable among legislators under female than male Proposers. Male proposers were almost twice as likely as females (51% to 27%) to propose minimal coalitions. The sex effect appears to be even stronger than the effect of transparency. Logit regression of:

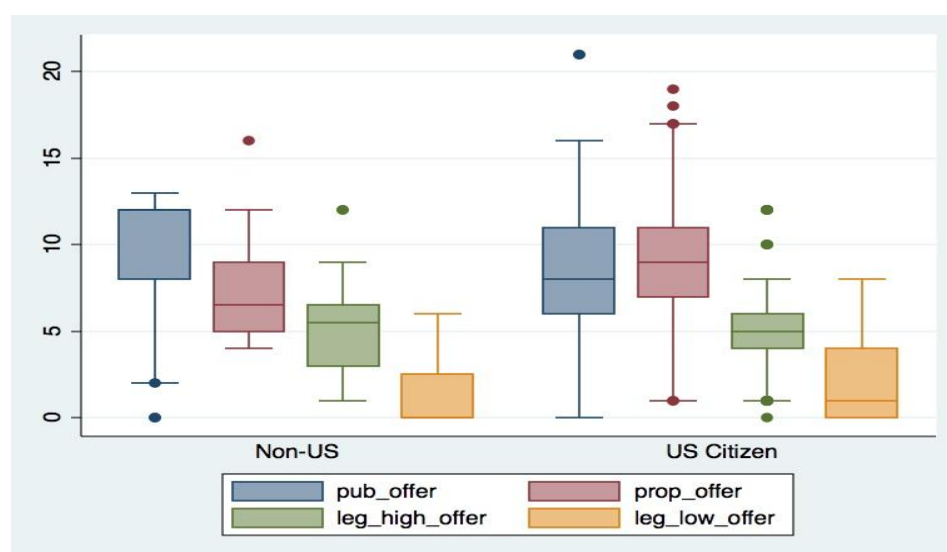
$$\Pr(\text{Minimum Coalition}) = a(\text{Constant}) + b_1(\text{Transparency}) + b_2(\text{Proposer Sex})$$

Shows both conditions to have strong estimated effects on the probability of minimum coalition offers. Holding other conditions at median values, shifting from ST to FT (the key jump in transparency) decreases the probability of a minimum coalition offer by 10%, whereas shifting from a male to female proposer drops the probability by 25%.

VII. 2. Citizenship

Fifteen percent of participants -- and thirteen percent of Proposers -- were non-US citizens. Given that this research was initially motivated by cross-national variations in legislative transparency, and the intuition that accountability follows from transparency, the experiment may ultimately provide insight as to whether participant country of citizenship conditions expectations about legislative behavior and electoral sanction. For now, it is worth noting that non-US Proposers appeared to be more Public-serving in their budget offers than did US citizen Proposers, as illustrated in Figure 14.⁹

Figure 114. *Boxplot of budget offers to each type of player, by Proposer's citizenship*



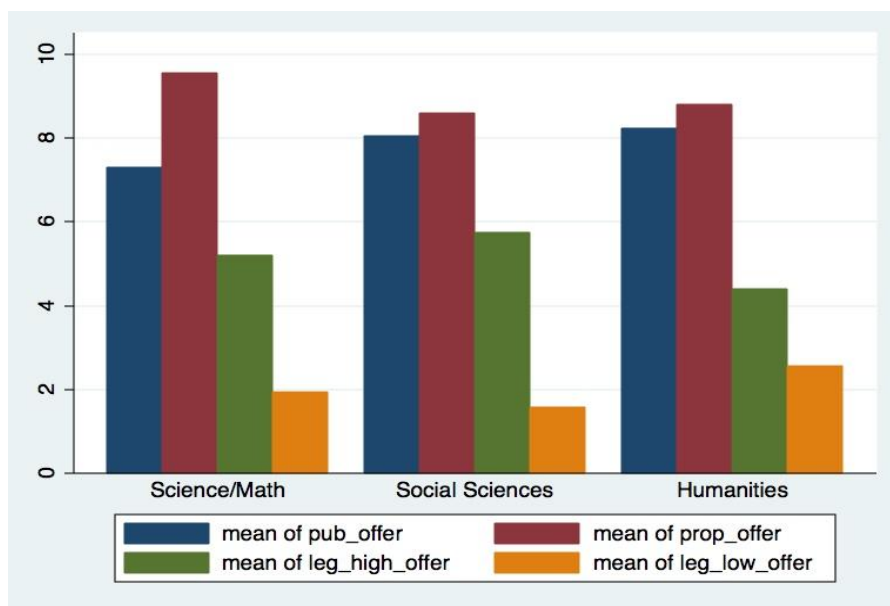
⁹ Patterns are slightly more difficult to discern using the boxplot than just a summary statistic (like mean offer), but given the imbalance in the numbers of US and non-US citizens, variances in the offer distributions might be expected to differ between the types.



VII. 3. Academic divisions

Student participants were asked to identify their field of academic concentration. I then divided the students, by their primary concentration, into the following divisions: humanities, social sciences, and science/math. Figure 15 shows little difference by participants academic predispositions.

Figure 12. *Mean budget offers to each type of player, by Proposer's academic division*



Those heavily invested in disciplinary stereotypes might also note that neither Economics nor Government (a.k.a. Political Science) majors were markedly different from other participants in their budget proposals, although Economics majors were slightly more inclined to minimal coalitions, and favored themselves as Proposers slightly more, and the Public slightly less, than other participants.

VIII. Preliminary Conclusions

Any conclusions from the results to date have to be consumed with caution owing to pilot nature of the experiments, which provide a limited number of observations, an extremely homogenous and non-representative participant pool, and a rudimentary game structure. This section focuses mainly on the shortcomings of the experiment so



far and speculation about how to improve it, but I begin by rehearsing some (admittedly preliminary) conclusions.

First, transparency is good for the Public. Consistent with the first two hypotheses, the greater the transparency, the higher the Public's budget shares (H1) and POs (H2). The direction of the effect is not particularly surprising, but the scope of the difference is impressive. Second, transparency appears to foster high rates of reelection by enabling Legislators to demonstrate unambiguously their fidelity to the Public's interest. Third, transparency appears to foster universalism among Legislators (H4), reducing the number of minimum coalitions (although not as much as having female Proposers does) and diminishing the spread between the lowest and highest Legislators' offers.

The results from these first experiments make it difficult to evaluate H3, that transparency non-Proposer Legislators would embrace Public-serving budgets, and reject Public-denying ones. There is some evidence that this is the case, but the strategic behavior of experimental participants -- avoiding Public-denying POs under FT mode -- leaves us with thin evidence on this count. Indeed, the success of these preliminary experiments in eliciting strategic behavior (and the avoidance of certain actions) is also a liability -- and I focus the rest of this discussion on the liabilities, some speculation about how to remedy them, and an open invitation for advice and suggestions.

IX. Next Steps

IX. 1. Solving the game

A principal shortcoming of the project to date is the absence of a formal solution to the game participants play. This is a direct product (or non-product) of the skill set of the researcher, which doesn't include formal modeling, so will require collaboration to remedy, but the payoff from solving the game should lead to more refined, and more fully justified, hypotheses. It might also point toward ways of recalibrating the experiment so as to increase the empirical leverage it provides.



IX. 2. Absence of failed budgets

Following directly on the above, in retrospect, I suspect that the near-total absence of failed budgets would not have taken me by surprise had a formal solution of the game been available. Intuitively, it seems clear that voting Yes on budget proposals is weakly dominant under NT, where any failed budget can be expected to yield wholesale electoral punishment from the Public. Under ST, where individual non-Proposers cannot be identified and individual votes are not visible, the incentives to vote No are not much greater. FT mode, by contrast, was designed to elicit what I call second-order accountability, which I expected to yield the rejection of Public-denying budgets. Yet Proposers, anticipating this, rarely floated low POs under FT -- an pattern that likely to be flagged by a formal solution, given my starting assumptions, and the design of the game.

At any rate, the experiment could be improved if it provided more leverage on whether and how second-order (or non-Proposer) accountability operates. The answer to that question is essential to determining whether voting transparency in legislatures matters to the quality of representation.

IX. 3. Mixing scripted and live players

One possible remedy here would be to run versions of the experiment in which participants are *told* they are playing with live participants when in reality they are playing with a script that follows certain prescribed actions -- for example, a Proposer that low-balls the PO even under FT. The votes on these POs by live-participant non-Proposers would constitute a test of second-order accountability, and the political relevance of visible voting. More generally, the use of experimental scripts would allow me to test for behaviors off the equilibrium paths onto which live participants tend to flow.

IX. 4. Altering punishments and payoffs

The current structure of the game limits the type and severity of the punishment the Public can mete out to Legislators. Consider that the game, as is, requires 10 players, 6 of whom are non-active at any given time (and, in cases of sustained reelection among active Legislators, possibly all the way through). The pool of non-active Legislators is



necessary as long as reelection is the currency by which the Public rewards/punishes Legislators.

Alternatively, however, the Public might be allowed to reward/punish with the currency of the experiment itself. Rather than a reelection round, the Public might be prompted to allocate some share of her profits from the prior round(s) to reward good legislative behavior. The Public could also be allowed to pay some premium in order to *strip* a Legislator of *his* profits as punishment for bad behavior.

This alteration would complicate the game modestly by making reward/punishment less of a blunt instrument, but it would radically simplify it logistically by reducing the number of participants, and eliminating the thorn in the side of many -- non-activity. It would also directly reveal the *relative* extent to which the Public values different behaviors -- good Proposing versus good voting, for example.

IX. 5. Web-based environment: Expanding the participant base

A variant of the game that eliminates non-active Legislators would also open up the prospect of moving the experiment out of a lab with networked computers and into a web-based environment in which participants interact with each other through a website connected to a common server.¹⁰ Indeed, moving out of the lab to a web-based environment could improve the experiment in much more important ways as well. It would reinforce anonymity among players. More importantly, a web-based environment would open participation to a far wider pool of players, including players in different countries, who may bring different norms and strategic expectations, based on their experiences with legislative representation and transparency, to the table.

IX. 6. Wild speculation: A social media app

Beyond a web-based experiment, it may also be possible to design a variant of the game as a social media app for computers or wireless devices, which participants could play not for cash but to accumulate points. Removing cash payoffs obviously alters incentive structures, but would also radically reduce the cost of conducting the experiment. If

¹⁰ Keeping non-active Legislators engaged is sufficiently challenging in the lab environment, and would present larger problems with participants playing in disparate locations.



participants could be attracted, and if the game could induce genuine competition over the fixed budget, this approach might generate abundant data, which in turn would allow for multiple refinements, variations, and extensions of the game itself.

IX. 7. Mixing transparency conditions across periods

The preliminary experiments set the transparency mode as constant across all 20 periods of play for a given group. Players learned the game and, in ST and FT modes in particular, tended to settle into stable patterns of behavior. In most real legislatures, by contrast, transparency varies across different legislative proposals, and strategic behavior might reasonably be expected to adapt as well. An obvious extension of the game (facilitated by cheap iterations, particularly in the social media app world) would be to allow for transparency to vary across periods and measure how the behavior of a stable set of participants is affected.

IX. 8. Multiple Publics with corresponding Legislators

One final variant -- facilitated both by increasing the number of iterations, and by reducing the number of participants (by eliminating non-active legislators) -- would be to allow for a separate Public corresponding to each Legislator.¹¹ Reward/punishment would then be focused on one's own unique representative, as in single-member district electoral systems. This variant would allow variation of transparency *across Legislators* in the same chamber (and even on the same vote!). It would allow measurement of how different (say, male versus female) Publics react to the same behaviors by their representatives. It would also allow estimation of how much Publics value (or object to) legislative logrolls.

In closing, the pilot effort of programming and running the experiment was moderately successful. Further progress will depend on securing grant funding to improve the experiment and run it, or variants of it, with a broader participant pool. Suggestions as to how to make these improvements (or how and where to secure grant support) are most welcome.

¹¹ Thanks to Simon Hix for this suggestion.



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APPENDIX: DOCUMENTS FOR EXPERIMENT PARTICIPANTS

Legislative Budgeting Experiment Instructions

Experiment ID# _____

This experiment is part of a study of decision making in legislatures. As a participant, you stand to make a substantial amount of money, which will be paid *in cash* at the end of the experiment. We expect your full participation in the experiment will take about 1 hour.

Materials. You have 4 types of handouts -- all stapled together (for now).

1. A copy of these instructions which you can look at anytime during the experiment. You will see your ID# for the experiment at the top of these instructions.
2. Two copies of a Consent Form on the experiment that you must sign in our presence. You keep one copy; the other stays with us.
3. Your receipt for payment in the experiment. Do not fill in the receipt now. At the end of the experiment we will tell you how to fill in the receipt.
4. A brief questionnaire on your individual characteristics.

No talking or communicating. One important rule of this experiment is that once we begin, no one is allowed to talk or communicate in any way with anyone else. *If you talk or communicate to someone else, you lose your right to payment.*

How will you be paid? Your payment depends partly on your decisions, partly on the decisions of others, and partly on chance. The payoffs are not necessarily fair, and we cannot guarantee that you will earn any specified amount beyond a minimum of \$10 that everyone will receive for participating. However, most participants can expect to make substantially more. The experiment consists of a series of group decision-making periods in which you will participate with others in deciding how to divide **24 budget units**. *In this experiment, each budget unit equals 50 cents (\$0.50).* At the end of the experiment, you will be paid in cash what you earned in those periods, plus \$10.

How does the experiment work? This experiment is conducted using the networked computers in the Carson Computer Lab. There are 10 participants, and the experiment will take place in a series of 20 periods.

Before the first period begins, here is what will happen:

- 1 of the 10 participants will be chosen at random to play the part of the **Public**. The other 9 will be **Legislators**.
- Of the 9 Legislators, 3 will be chosen at random by the computer to be active for the first period. The other 6 will initially be non-active, but remain standing by.
- All participants will be informed whether the experiment will be conducted under conditions of **Transparency** or **Non-Transparency**, which refers to



how much information the Public receives about the Legislators' actions. (The details of Transparency and Non-Transparency are explained further below.) Once the condition is assigned, all periods will be played under that condition.

In each period, here is what will happen:

- Of the 3 active Legislators, the computer will choose one at random to be the **Proposer** for that period.
- The Proposer will be prompted to divide a budget, however she or he wants, among the 4 active players -- the Public and the 3 active Legislators (one of whom is the Proposer). The available budget in every round is 24 units. Units may not be divided; proposals must be made in full units. The Proposer may give some part of the budget to every player, but is not required to do so.
- All Legislators see the full proposal -- that is, how many budget units the Proposer suggests for each active Legislator, and for the Public.
- Each active Legislator is prompted to vote either to Approve or Reject the proposed budget. [Note that the Proposer is an active Legislator, so the Proposer will have 1 of the 3 votes. Note also that the Public does *not* vote on whether the budget passes.]
 - If a majority (2 or 3) of the Legislators votes to Approve, then the budget passes, and players receive payoffs according to the proposal.
 - If less than a majority (0 or 1) of the Legislators votes to Approve, then the budget is rejected, and all players get zero payoff for that period.

Transparency Condition

- The Public is informed of:
 - the identity of the Proposer;
 - how much the proposed budget offered to each of the Legislators, as well as the Public;
 - how each Legislator voted (Approve or Reject) on the budget proposal;
 - whether the budget was approved or rejected.

Semi-Transparency Condition

- The Public is informed of:
 - the identity of the Proposer;
 - whether the budget was approved or rejected;

Non-Transparency Condition

- The Public is informed only of:
 - whether the budget was approved or rejected.

Note: Under Non-Transparency, the Public receives no information about the Proposer, what each legislator was offered under the proposed budget, or how Legislators voted.

- Each player (the Public and the 3 active Legislators) is informed of her/his



payoff for that period -- that is, how much, if anything, s/he will receive as a result of the budget outcome -- and what her/his current total profit is from all decision periods up to now.

- For each active Legislator, the Public is given the option to Approve or Reject that Legislator for "reelection" to participate in the next decision period.
 - If an active Legislator is approved, s/he will continue as active in the next period.
 - If an active Legislator is rejected, s/he will be sent to the pool of non-active Legislators.
 - Note: The Public does not vote to Approve/Reject Legislators in the last period of the experiment.

In between each period, here is what will happen:

- Any Legislator(s) from the previous period who were rejected are replaced by previously non-active Legislator(s), chosen at random by the computer.
- Note: A rejected Legislator is not eligible to be selected for the period immediately following her/his rejection. In future periods, the Legislator is eligible to be drawn at random again.
- Each of the 9 Legislators is informed whether s/he will play in the next period.

After all 20 periods are over:

- Each participant will be informed by the computer of her/his total payoff from the experiment. Participants should stay at their computer screens while a member of the experiment staff comes around to help fill in the receipt form. You may also fill out the participant information questionnaire at this time.
- The staff and participant will both confirm that the amount is correct, will fill in the amount on the receipt, and each will sign the receipt to confirm the amount.
- The participant may then take her/his receipt and questionnaire to the experiment cashier, who will make payment in cash. The participant will sign once more to confirm receipt, and the cashier will collect the receipt.



Consent Letter for Carey Legislative Budgeting Experiment

You will participate in a series of simulated negotiations over a budget. The experiment examines how information and voting affect bargaining outcomes. The experiment will take place on computer terminals. Before the experiment you will be given an identification number. Throughout the experiment you will only be identified through this number. As such, any decisions you make will be anonymous. Also in any future reporting of the results, your identity will remain confidential.

The experiment will last approximately one hour. For your participation you will be paid a guaranteed base fee of \$10. You may have the opportunity to make more than this, depending both on chance and on the decisions you make. Each subject may be paid a different amount depending on these factors. You will be paid in cash after the experiment has ended.

You will be allowed to terminate your participation in the experiment at any time without any penalty to you. After the series of experiments is completed you may contact Professor John Carey (603 646 1130, john.carey@dartmouth.edu) for the results of the study. Also, if you have any further questions about this study please contact Professor Carey, or the Committee for the Protection of Human Subjects at 603 646 6482.

I voluntarily consent to participate in the experiment described above:

Full name (printed) _____

Signature _____

Date

Phone contact information _____

E-mail contact information



Legislative Budgeting Experiment Receipt

Experiment ID# _____

Guaranteed Participation Fee: \$10

Total Profit from budget experiment: _____

TOTAL PAYMENT DUE: _____

I confirm that the amount above is the full and correct amount due from participation in this experiment.

Experiment Participant Signature

Experiment Staff Signature

Date

I confirm receipt of my total payment due.

Experiment Participant Signature

Experiment Staff Signature

Date



instituto de iberoamérica
universidad de salamanca

Documentos de Trabajo

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