The Effects of Identities, Incentives, and Information on Voting[1]

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Abstract

We report on majority voting experiments where subjects are randomly assigned identities in common with a candidate. However, subjects sometimes receive a financial incentive from voting contrary to their identity. We vary the size of the incentive as well as information voters have about the advantage of the incentive. We find that subjects are influenced by their assigned identities and the effect is stronger when voters have less information. Nevertheless, financial incentives reduce this influence. Our results suggest that identity may have an important affect on voter choices in elections where incentives and information are low.

What motivates voters in large elections? Although the literature on this question in political science, as well as social science more generally, is lengthy and extensive, much disagreement exists over which answer best explains voter behavior. Pure rational choice based theories contend that voters choose to achieve an electoral outcome closer to their preferences–that is, they have instrumental or investment motivations. These theories have difficulty explaining why voters may be motivated to vote at all since the expected benefits depend on the probability that a single vote is pivotal and given the small size of this probability in a large election, these expected benefits are likely to be substantially lower than the costs of participation.[1]

One proposed solution is to incorporate into the analysis group leaders, or in some perspectives, party leaders, who motivate voters to turnout in elections via selective, individualized incentives which may be social in nature. For example, precinct captains may promise to help voters with securing public services if they participate or union leaders may provide members with rides to the polls and election-related social events.[2] Much detailed qualitative evidence exists that parties and other groups engage in mobilization tactics using selective incentives.[3] Furthermore, large scale empirical studies of aggregate voter behavior based on group models have supported theoretical predictions of the models.[4]

However, given that ballots are secret, selective incentives alone cannot explain how voters choose once in the ballot booth and how groups might influence these choices since there are no legal credible mechanisms by which groups can verify voters' choices.[5] There are three possible explanations. The first simply assumes that individuals' preferences are equivalent to the group that has mobilized them. Given that there is some probability that an individual's vote is pivotal in deciding the outcome (even though that probability may be infinitesimal) the individual votes to maximize those preferences. A second related approach is the ethical voter theory of Feddersen and Sandroni (2006a,b,c) and Coate and Conlin (2004). They present an alternative to the group mobilization theory wth the same predicted turnout behavior. They show that if we assume that voters' have ethical preferences (in the version of Coate and Conlin care about

the welfare of the group) this can endogenously lead to apparent group benefit maximizing turnout and vote choices without group leaders explicitly mobilizing voters. In their theory group identities and the small probability that a vote is pivotal lead to voters participating without explicit mobilization efforts as well as influencing their choices in the ballot booth such they vote to benefit their social group. Feddersen, Gailmard, and Sandroni (2008) present experimental evidence in support of the ethical voter theory.

The third plausible explanation is psychological. That is, individuals might choose according to their group identities because they psychologically identify with the group that mobilizes them independent of the probability of being pivotal or ethical concerns. Under this explanation, selective incentives may get individuals into the voting booth, but once inside, the voters identify with their mobilizers and make choices influenced by that identification.[6] The experimental psychology literature on minimal group effects has shown that just assigning subjects randomly to group identities, even when subjects know the assignments are random, results in subjects making choices that are influenced by their group identity.[7]

The three explanations have different views of how individuals choose once in the ballot booth. The individualistic rational choice theory predicts that voters will choose to maximize their expected payoff from the election outcome assuming that there is some positive probability of being pivotal. The ethical voter theory predicts that voters will choose to maximize the social welfare of their group or voters in general, depending on assumptions. The psychological approach predicts that voters will make choices that reflect their group identities and these choices may or may not maximize their personal expected payoffs or even the group's expected benefits.

The secret ballot makes it difficult to evaluate which of these theories of how voters choose once in the ballot booth best explains behavior. First, we need situations where we can clearly distinguish between choices that are identity influenced from those that maximize expected payoffs from an election for either the group or the individual. We have two main sources of

data on voters' choices–self-reports in surveys and ballot images. Survey data is useful when we have other information on the respondents that may reflect mobilization efforts by groups or group identities which can be used to determine the effects of these efforts or identities on voter choices. Yet, survey data has problems. Although we can to some extent verify turnout decisions of surveyed voters, we cannot verify their choices once in the ballot booth. Moreover, the information we have on mobilization efforts is also often self-reported and it is difficult to measure voters' personal expected payoffs from the election.

In contrast, ballot image data allows researchers to know precisely how voters choose on a set of contests on the same ballot and, using sophisticated techniques, can be used to estimate voters' ideal points given specific assumptions about their utilities from voting. Yet, we do not have individualized mobilization information or other individualistic information besides vote choices and we thus cannot determine how the individual voters' choices may be affected by group identities or their personal expected payoffs.

An alternative data source is the choices of participants in laboratory experimental voting games. A growing body of work has used laboratory voting games to evaluate theories of voting where subjects are given monetary incentives to induce them to have preferences over outcomes as in the evaluated theory. For example, Levine and Palfrey (2006) consider how abstention choices change as the number of voters increases in an evaluation of the pivotal voter theory of turnout. The subjects are paid based on the final outcome of the voting game and the relationship between the payoffs and the outcomes are held constant as the number of voters are increased. Similarly, Morton and Williams (1999) and Battaglini, Morton, and Palfrey (2007) compare voter choices under simultaneous and sequential voting games also holding the relationship between payoffs and outcomes constant.

In experiments such as Gerber, Morton, and Rietz (1998), Morton and Williams (1999), and Bassi (2006), voters are randomly assigned "types" with different outcome payoffs schedules by type. For instance, in the three choice voting game of Gerber, Morton, and Rietz (1998), the

choices are labeled Green, Blue, and Orange and the voters are assigned to either Green, Blue, or Orange types. Green voters have a different payoff schedule from Blue voters such that Green voters are paid most when Green wins; Blue voters are paid most when Blue wins; and Orange voters are paid most when Orange wins. Green voters are also paid more when Orange wins than when Blue wins (although less than they are paid when Green wins) and Orange voters are paid more with Green wins than Blue wins (although again less than they are paid when Orange wins). Blue voters are paid the same win either Orange or Green wins.

The goal of assigning voters to these types and giving them differing payoffs depending on which option wins is to induce voters to have preferences over the outcomes. Thus, if the subjects are maximizing their financial incentives, then Green voters will have a first preference for Green, a second preference for Orange, and a third preference for Blue. Orange voters will have a first preference for Orange, a second preference for Green, and a third preference for Blue as well. Blue voters will have a first preference for Blue and will be indifferent between Green and Orange as their second and least preferred option. Assuming that subjects are maximizing financial incentives, the authors then investigate how different voting rules affect the subjects' choices, determining when voters vote sincerely for the option that gives them the highest payoff or strategically for the option that gives them their second highest payoff.

By keeping the relationship between election outcomes and payments constant across different institutions, the researcher can then compare institutions. Causal inferences such as these can often be impossible using non-experimental data because of the difficulties in making cross-country and cross-time comparisons given the co-variation in other relevant variables. The control allows researchers to disentangle specific causal effects that are predicted by the theory. These studies provide much insight into how different institutional setups influence actual subject behavior given preferences as assumed in the theory.[8]

But we can also think of the assigned types of the subjects as reflecting the identities of a group or party that mobilized voters to turnout using selective incentives. The minimal group

literature suggests that these voters' choices may be influenced by their assigned types even when they do not receive payoffs that depend on which candidates win. Does this result from the minimal group literature generalize to explain how voters choose in elections when assigned types? A laboratory voting game where subjects are assigned to group identities as in the minimal group literature but are not given payoffs that depend on the election outcome can help answer this question.

Furthermore, if we do observe that group identities in the absence of election payoffs influence subjects' votes, in order to determine the size of this influence, it is useful to have subjects participate in a voting game in which they receive a financial incentive to deviate from their assigned types. If subjects value financial incentives over the benefits of their assigned identity, then they will vote against their group identity. The extent that voters do so can be a measure of the strength of the assigned identities. Similarly, to determine if subjects are influenced by these assigned identities then the experiment should also be designed such that ethical motivations for voting one's identity are also not relevant.

Varying the size of the financial incentive and the information subjects have about other voters can also determine the strength of the group identity effect. That is, if the type assignment effect is significant, then increasing financial incentives that work against the assigned identity should lead to further reductions in the effect. If the effect of the assigned identity is small, increasing financial incentives should have little effect. The anticipated effect of varying how much information subjects have about other voters is ambiguous. One might think that in a complex voting game with incomplete information, group identities will be more salient than in a less complex one and that subjects would be more likely to rely on identities. However, uncertainty about the distribution of types in the voting game may dilute the effects of assigned identities if voters think there is a high probability that there are few other voters like them in the game.

Suprisingly, although a large literature exists on the effects of financial incentives on subjects'

choices in a sizeable number of decision making contexts, a study of the effects of assigned types in the absence of financial incentives in laboratory voting games has not been previously conducted.[9] In this paper we provide such a study. In our experiments we not only consider how subjects with randomly chosen group identities choose in the absence of payoffs based on the outcome of the voting, but also how they choose when given varying financial incentives to deviate from their identities and incomplete information about the distribution of other voter types.

The Experimental Design

The Voting Game

General Experimental Procedures

Subjects were recruited from the undergraduate population at a large public university and had no prior experience with our experiment. Upon arrival, subjects were seated at computer terminals. The computer terminals were placed throughout the laboratory so that subjects could not see each others' displays. A monitor was present to answer questions, to ensure that subjects did not communicate with each other, and to pay subjects after the experiment ended. When a subject entered the laboratory, she was given a card with a unique subject number, which identified the subject during the experiment. Although each subject obviously knew her own subject number, she did not know the subject numbers assigned to others.

The experimental program displayed the instructions to each subject. Subjects read them at their leisure and were permitted to ask questions about the procedures. The instructions took between five to ten minutes to read. Afterward, each subject took an online quiz. Once all subjects passed the quiz, the experiment began and it lasted approximately an hour. At the end of the experiment subjects were paid privately in cash. The average payment was 22 dollars per subject.

Subjects were told that they would participate in a series of elections and that the elections would be decided by majority rule. They were not told how many elections would take place.

On each subject's display for each period appeared a payoff schedule, which we describe below, that showed a subject how much she would earn if she voted for an alternative and it won a majority rule election, and how much she would earn if she voted for an alternative and it lost. Subjects were also given information about the payoff schedules of other voters as described below.

Voter Payoffs

Subjects were divided into groups of 5 voters. Subjects chose whether to vote for one of two options, labeled green or red, which we denote as G and R, respectively (abstention was not allowed). We used a minimal group setup where subjects were assigned in each period to two identities: g for green or r for red.[10] Subjects were told that each subject's type was a random, independent draw. However, draws were not purely random as the computer program's draws were designed to ensure that in each period at least one subject was of each type [that is, the possible combinations were either 4 green and 1 red, 3 green and 2 red 2 green and 3 red, or 1 green and 4 red].[11]

In our experiments, when we used payoffs based on election outcomes, we used the payment schedule presented in Table 1 below where $x \geq y \geq 0.5x \geq 0$:

Table 1: Payoff Schedule

	Green Voters' Individual Payoffs	
Green Voter's Vote Choice	Green Wins	Red Wins
Green	x	$x - y$
Red	0	y
	Red Voters' Individual Payoffs	
Red Voter's Vote Choice	Green Wins	Red Wins
Green	y	0
Red	$x - y$	x

As can be seen, when subjects were paid based on election outcomes, their expected payoffs depended not only on who won but on how they voted independent of the effect of their vote on the outcome of the election. Suppose that $x > y > 0.5x > 0$. If G won, a g subject received her highest payoff, x, if she voted for G, but 0 if she voted for R. If R won a g subject received $y \leq x$

if she voted for R, but she received $x - y \leq y$ if she voted for G. As a consequence, subjects who expected the candidate who would give them the highest payoff to lose had a financial incentive to vote against their assigned identities for the other candidate. Note also that in this situation subjects had no ethical motivation for voting their identity as their votes were not pivotal and thus only their private payoff was affected by their votes.

Voting against the subjects' assigned identities in this experiment is different from strategic voting in most voting games with three or more choices as in the game studied by Gerber, Morton, and Rietz (1998) described above. That is, in the Gerber, Morton, and Rietz game there were 4 Green voters, 4 Orange voters, and 6 Blue voters. Green voters could vote strategically for Orange if they believed Green had little chance and the contest was between Orange and Blue or Orange voters could vote strategically for Green if they believed Orange had little chance and the contest was between Green and Blue. But this strategic voting was successful (yielded a higher payoff) only if at least two other voters of the same type also vote strategically (if everyone else is voting sincerely, the optimal response for an Orange or Green voter is to vote sincerely in those voting games). In our experiment, when subjects received financial incentives they have a positive incentive to vote against their identity when they are in the minority if the majority is voting their identity regardless of how many other voters of their type are voting against their identity. Thus these incentives to vote contrary to identity did not depend on coordination with other voters of their own type. Furthermore, the incentives were individualistic; they only benefitted the voter, not a group of voters or overall voter social welfare.

We investigated three payoff treatments:

1. No payment treatment where $x = y = 0$ and subjects were paid a flat fee for participation of \$22.

2. Low payment treatment where $x = \$1.5$ and $y = \$1$ which on average yielded the subjects approximately \$22.

3. High payment treatment where $x = \$3$ and $y = \$2$ which on average yielded the subjects approximately \$44.

The payoffs were presented to the subjects in a table form. In the no payment treatment subjects were told to make choices "as if" they were maximizing the payoffs in the low payment treatment and shown the low payment payoff table. Thus, in this treatment, although voters were encouraged to think of the payoffs as what they were maximizing, they were given no financial incentive to do so and thus received no explicit financial benefit from deviating from their assigned identity if they anticipated that their type would lose (for example, if they were in the minority and the majority voters were voting sincerely). In the low payment treatment subjects received a \$0.50 incentive to deviate from their assigned identity if they anticipated that their type would lose and in the high payment treatment subjects received a \$1.00 incentive to deviate from their assigned identity if they anticipated that their type would lose. Again, note that these benefits from deviation did not depend on any coordination with other voters of the same type, only on the presumption that voters in the majority would vote sincerely.

Voter Information and Treatment Assignments

We also varied how much information subjects had about the distribution of subject types in their groups. In the complete information treatment, subjects were told in each period the complete distribution of voter types (although subjects were always anonymous) while in the incomplete information treatment in each period each subject was told his or her own type as well as the types of two other randomly drawn subjects. In each period the information revealed about other subjects were new random draws. As noted above, the anticipated effects of incomplete information are ambiguous. On the one hand, we might expect that subjects will be more likely to vote their identities under incomplete information because the game is more complex. But on the other hand, subjects may be less likely to vote their identities if they are uncertain about the distribution of other voter types and the effects of identity is diluted.

We utilized both within and between-subjects designs across treatments. That is, in some

groups subjects participated in more than one payment or information treatment and in others they participated in only one of the payment and/or information treatments. If subjects only participated in the no payment treatment, they received a fixed payment of $22 for their participation in the experiment as well as the show-up fee received by all subjects across payment treatments. Table 2 presents a summary of how payment and information treatments were distributed across voting groups in the experiment. Note that sessions ranged from 16 to 24 periods. In total we observed 1,080 voting decisions. Furthermore, we have no observations where partial information treatments followed full information ones because in such cases subjects might suspect, given their experience under full information, that the types of other subjects were not purely random [in the partial information treatments subjects were never revealed the ex post distributions of types in a particular period, only the winner of the election in that period, so such updating was not possible].

Table 2: Payoff & Information Treatment Distributions

	Periods		
Group	**1-8**	**9-16**	**17-24**
1	No Pay/Comp. Infor.	Low Pay/Comp.Infor.	High Pay/Comp. Infor.
2	High Pay/Comp. Infor.	Low Pay/Comp. Infor.	No Pay/Comp. Infor.
3	No Pay/Incomp. Infor.	Low Pay/Incomp. Infor.	High Pay/Incomp. Infor.
4	High Pay/Incomp. Infor.	Low Pay/Incomp. Infor.	No Pay/Incomp. Infor.
5	Low Pay/Incomp. Infor.	No Pay/Incomp. Infor.	High Pay/Incomp. Infor.
6	High Pay/Incomp. Infor.	No Pay/Incomp. Infor.	Low Pay/Incomp. Infor.
7	No Pay/Comp. Infor.		
8	Low Pay/Comp. Infor.		
9	High Pay/Comp. Infor.		
10	No Pay/Incomp. Infor.	No Pay/Comp. Infor.	
11	Low Pay/Incomp. Infor.	Low Pay/Comp. Infor.	
12	High Pay/Incomp. Infor.	High Pay/Comp. Infor.	

Predictions

Predictions When Voters are Uninfluenced by Identity

Complete Information Voting Game

As noted in the Introduction, the rational choice and psychological approaches make different predictions about how subjects will vote. We will first discuss the rational choice predictions

when subjects have complete information over the distribution of types in the electorate, assuming that subjects in the low and high payment treatments maximize their monetary gains and subjects in the no payment treatment follow the instructions to maximize payment amounts in the table they are shown.

As in many other similar voting games, there are multiple equilibria. In order to narrow down our equilibrium predictions we first assume that voters use symmetric strategies; that is, voters of the same types in the same information set are assumed to use the same strategies. Nevertheless, multiple equilibria also exist with symmetric strategies. For example, suppose that there are three green voters and two red voters. One Nash equilibrium is for all to vote green, while another is for all to vote red. In fact, both of these equilibria in pure strategies can be easily shown to exist regardless of the distribution of voting types; even when all voters are green (red) a Nash equilibrium exists where all vote red (green).

However, such equilibria where all vote for the candidate who gives the minority of voters the highest payoff are not coalition-proof. Moreover, it seems natural that the equilibrium where everyone votes for the candidate who gives the majority of voters the highest payoff would be focal. Thus we use the following as our benchmark for the Nash equilibrium payoff maximizing behavior:

Predicted Nash Behavior in the Complete Information Voting Game: *Subjects vote sincerely for the candidate who gives them the highest payoff when in the majority and strategically for the other candidate when in the minority.*

The Nash prediction assumes that the subjects are fully rational, maximize the payoffs they are assigned, and make no errors. However, previous research suggests that financial rewards affect the cognitive attention of subjects to the tasks and we might expect that subjects make fewer errors as financial rewards increase. To consider this possibility we assume that voters' perception of their payoffs are subject to random disturbances which are related to financial incentives. Specifically, define σ as a mixed strategy profile for voters in the game, $\pi_{ii}(\sigma)$ as

the expected payoff to a voter of type i from voting for a candidate of type i (that is voting his or her identity) given the other players follow σ_{-i}, and $\pi_{ij}(\sigma)$ as the expected payoff to a voter of type i from voting for a candidate of type j (that is voting contrary to his or her identity) given the other players follow σ_{-i}. Following Goeree, Holt, and Palfrey (2005) we assume that there is are two additional privately observed payoff disturbances, ε_{ii} and ε_{ij} such that a voter of type i's disturbed payoff is given by:

equation (1) $\quad \widehat{\pi}_{ii}(\sigma) = \pi_{ii}(\sigma) + \mu_i \varepsilon_{ii}$ and $\widehat{\pi}_{ij}(\sigma) = \pi_{ij}(\sigma) + \mu_i \varepsilon_{ij}$

where the error rate μ_i is a strictly positive real number. For each voter, the payoff disturbances are assumed to have a joint distribution which can be represented by a density function with marginal densities that exist for each distrubrance. The disturbances are assumed to be independent across voters (but not necessarily across strategies) and unbiased.

Voters are assumed then to choose strategies to maximized their disturbed payoffs given others' choices as in a Nash equilibrium. We solve for the fixed point of this iterative process using the logit specification, where the quantal response functions are logit curves. We assume that for all voters $\mu_i = \left(\frac{1}{\lambda}\right)$ and we estimate λ as the response parameter. This yields the quantal response equilibrium (QRE) predictions.[12] When $\lambda = 0$, the response curves are flat and the voters randomize between voting sincerely and strategically. This is the case where the subjects completely ignore their assigned payoffs and choose randomly. As λ approaches ∞, the logit response curves converge to the best response curves. Hence, the Nash equilibrium predictions correspond to a boundary case of the QRE model.

However, as discussed in Goeree, Holt, and Palfrey (2005), the additive disturbance in equation (1) puts some restrictions on the choice probabilities: "Translation Invariance" (adding a constant to all payoffs does not change the choice probabilities); "Symmetry" (the effect of a change in the payoffs of strategy A on the choice probability of strategy B is the same as the effect of a change in the payoffs of strategy B on the choice probability of strategy A); and "Strong Substitutability" (if the payoffs of one strategy increases (decreases), then the choice

probabilities of all the other strategies decrease (increase)).

These latter restrictions may not translate in plausible restrictions in certain empirical contexts. For instance the 'Translation Invariance' condition is not plausible in settings where the magnitudes of perception errors depend on the magnitudes of expected payoffs: for instance in a bargaining game a $1 error would be unlikely for games where the pie sums to $1, but it would very common where the pie has a value of $100.

Since our experiment involves large changes in payoffs scaled across different incentive treatments, we use the "Regular QRE" refinement that, allowing for a multiplicative error structure, has been shown to provide a better fit to laboratory choice data.

We model scale-dependent shocks by re-scaling the payoffs in a way that the errors in the different games always have mean 1. In this way, the errors are linearly scale-dependent, but the choice probabilities are invariant.

We thus use the following functional form for estimating λ for the different payment treatments (where $\sigma_{i,i}$ is the equilibrium probability that voter i votes for candidate i and n is the scaling parameter):

$$\sigma_{i,i} = \frac{\exp\{\pi_{i,i}(\sigma)\left(\frac{\lambda}{n}\right)\}}{\exp\{\pi_{i,j}(\sigma)\left(\frac{\lambda}{n}\right)\} + \exp\{\pi_{i,i}(\sigma)\left(\frac{\lambda}{n}\right)\}}$$

In our experiment since the payoffs in the high payment treatment are double the payoffs in the low and no payment treatment, $n = 2$. We use our estimates of these response parameters to evaluate the effects of financial incentives on convergence to the Nash equilibrium.

Incomplete Information Voting Game

Solving for equilibria in the incomplete information voting game when subjects maximize expected payoffs is more complicated as subjects must not only consider how others will vote but also the information that others may or may not have when voting. Subjects are potentially in three different information sets which we label as follows:

1. Two other subjects of the five are the same as the voter. Thus, if the subject is green, the possible distributions are 5 green and 0 red, 4 green and 1 red, or 3 green and 2 red.

2. One subject is the same as the voter and one subject is different. Hence, if the subject is green, the possible distributions are 4 green and 1 red, 3 green and 2 red, or 2 green and 3 red.

3. Two other subjects are different from the voter. Thus, if the subject is green, the possible distributions are 3 green and 2 red, 2 green and 3 red, or 1 green and 4 red.

As in the complete information game there are multiple equilibria. We focus on the coalition-proof equilibrium that we believe is focal and "natural" in the same way that voting for the candidate favored by the majority is focal and "natural." That is, the equilibrium that is more likely to lead to wins by the candidate favored by the majority. We determined this equilibrium by calculating the probabilities of each of the possible distributions occurring in each information set, the associated probabilities of the information known by the other voters, and assuming that subjects' maximize expected payoffs accordingly.[13] We summarize the predicted behavior below:

Predicted Bayesian-Nash Behavior in the Incomplete Information Voting Game: *Subjects vote sincerely for the candidate that yields them the highest payoff when they either learn that at least one other voter is the same as themselves (information sets 1 and 2) and strategically for the other candidate when they learn that at least two other voters are different from themselves (information set 3).*

Although the calculations behind these predictions are tedious, the intuition behind them is relatively simple. When voters observe that at least one other voter is the same as themselves they know that there is a greater than 50% probability that they are in the majority and that there is a higher than 50% probability that other voters also observe that their type is in the majority. When voters observe that at least two other voters are different from themselves the

opposite is true. If all voters adopt the Bayesian-Nash predictions of voting sincerely in the first case and strategically in the second, then expected utility is maximized for all, given rational expectations on the choices of the other voters' given their expected information.

As with the complete information case, we expect that subjects might make errors, even if they are maximing their payoffs. Hence, we solve for the QRE predictions as above. Values of the response parameters can then be used as described above to determine the effects of varying financial incentives and complexity

Predictions When Voters are Influenced by Identity

The predictions above assume that voters are not influenced by their assigned identities. We assume that the disturbances to voters' payoffs are unbiased as noted above. To determine whether subjects are influenced by their assigned identity, we modify equation (1) above as follows:

equation (2) $\quad \widehat{\pi}_{ii}(\sigma) = \pi_{ii}(\sigma) + k + \mu_i \varepsilon_{ii}$ and $\widehat{\pi}_{ij}(\sigma) = \pi_{ij}(\sigma) + \mu_i \varepsilon_{ij}$

where k is a parameter which represents the additional utility a voter of type i receives from voting for candidate of type i. Note that we assume that this additional utility is independent of the choices of other voters' choices and thus is not a function of σ.

To determine if voters receive intrinsic utility from voting their identities we estimate λ and k simultaneously in using the following functional form for the zero and low payment treatments:

$$\sigma_{i,i} = \frac{\exp\{(\pi_{i,i}(\sigma) + k)\lambda\}}{\exp\{(\pi_{i,j}(\sigma))\lambda\} + \exp\{(\pi_{i,i}(\sigma) + k)\lambda\}}$$

and for the high payment treatment:

$$\sigma_{i,i} = \frac{\exp\{(\pi_{i,i}(\sigma) + k)\frac{\lambda}{n}\}}{\exp\{(\pi_{i,j}(\sigma))\frac{\lambda}{n}\} + \exp\{(\pi_{i,i}(\sigma) + k)\frac{\lambda}{n}\}}$$

Experimental Results

Complete Information Treatments

Financial Incentives and Voting Behavior

The voting behavior in the complete information treatments is reported in Table 3 below. In the complete information voting games we find support for the coalition-proof Nash equilibrium prediction that voters will vote sincerely when they are in majority, regardless of whether they receive financial incentives and the size of the incentives if they are received. We find no significant differences between payment treatments for these voters.[14]

Table 3: Voter Behavior in the Complete Information Games

Voter Type	Payment Type	Sincere Vote	Strategic Vote	Obs.
Majority	None	96.88%	3.13%	96
	Low	97.92%	2.08%	96
	High	100%	0%	97
Minority	None	51.56%	48.44%	64
	Low	4.69%	95.31%	64
	High	3.17%	96.83%	63

However, when voters are in the minority, we find less support for the coalition-proof Nash equilibrium in the no payment treatment compared to the paid treatments. We find that voters are significantly more likely to vote sincerely when they are in the minority in the no payment treatment compared with the low and high payment treatments combined. That is, in the no payment treatment approximately 52% of the voters in the minority vote sincerely, while in the low payment treatment only 5% do and in the high payment treatment only 3% vote sincerely [t statisic = 7.29 for the comparison between the unpaid and paid treatments]. As noted above, this could reflect an intrinsic motivation of subjects to vote sincerely their assigned identity.

The tendency to vote sincerely for voters in the minority may also be a rational decision if majority voters make errors. That is, suppose that there are three green voters and two red. If a red voter thinks that there is a probability that green voters might make a mistake and vote red, then they may find it optimal to sometimes vote red as well. Thus, the tendency of minority voters to vote sincerely may simply reflect an optimal response to majority voters

making errors. However, in the no payment treatment majority voters voted sincerely 96.88% of the time. Thus, it does not appear that the sincere voting observed in the no payment treatment is an equilibrium response to mistakes made by majority voters and does reflect an induced "identity" to their assigned type when in the no payment treatment. This result is similar to that found in the minimal group literature discussed above.

Although these significance tests are informative, a better evaluation of the closeness of behavior to the Nash prediction is afforded through our QRE estimation. Figure 1 shows the relationship between the predicted QRE probabilities of voting sincerely as a function of whether a voter is in the majority or minority and the corresponding equilibrium values of λ for the full information voting games with $k = 0$. The observed values are represented by the circles on the figures and the vertical lines represent the estimated values of λ. Table 4 presents the results of the estimation.

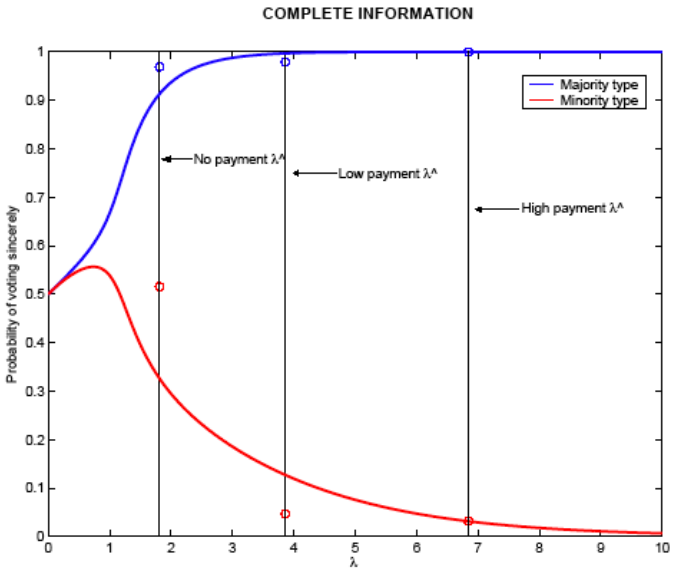

Figure 1: Complete Infor. QRE Est. with $k = 0$

Table 4: Complete Information QRE Estimations with $k = 0$					
	Payment Treatments				
Prob. Sincere Voting	No	Low	High	Combined	Combined Low & High
Majority Voters Obs.	0.97	0.98	1.00		
Majority Voters Est.	0.91	1.00	1.00		
Minority Voters Obs.	0.52	0.05	0.03		
Minority Voters Est.	0.33	0.13	0.03		
λ	1.81	3.86	6.85	2.81	4.79
log. likelihood	-65.00	-26.25	-8.87	-120.55	-37.51
χ^2 test statistic				-40.85	-4.79

What happens if we estimate both k and λ simultaneously? Figure 2 demonstrates the relationship between these two variables.

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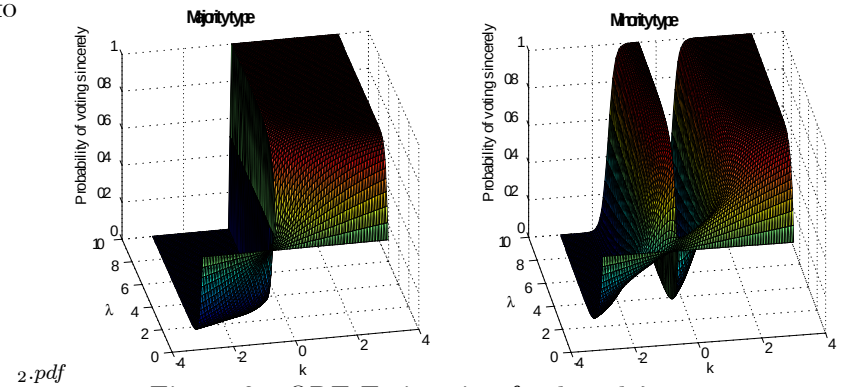

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Figure 2: QRE Estimation for k and λ.

To understand better the relationship, it is useful to cut the figures into slices for different values of k as in Figures 3 and 4 below.

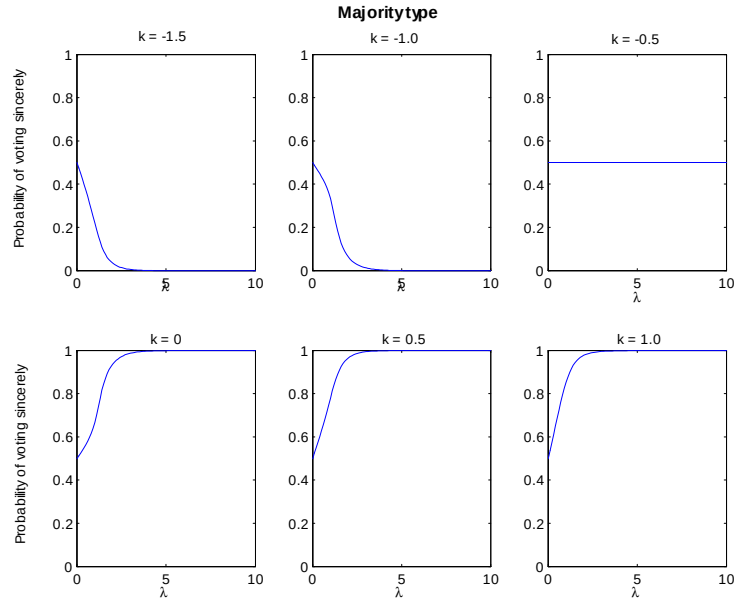

Figure 3: Slices for Majority Type

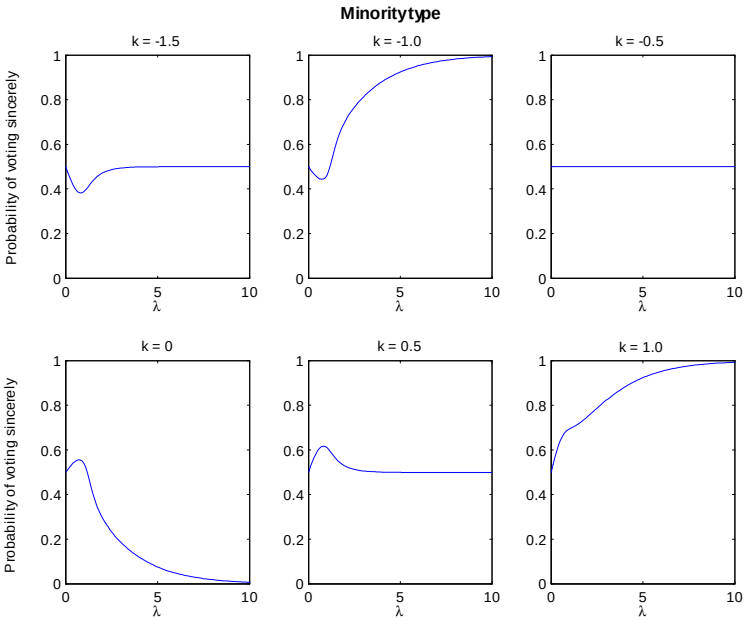

Figure 4: Slices for Minority Type

First, consider the choices of majority voters. When k has positive values, the players in the majority group will vote more and more sincerely as λ increases. When $k = -0.5$, the game is a version of a battle of the sexes game and players randomize with equal probability between voting red and green. When $k = -1.5$ voting strategically weakly dominates voting sincerely

and the players in the majority group will vote less and less sincerely as λ increases.

For values of k included in the interval $(-1.5, -0.5)$, voting strategically is still the Nash equilibrium strategy for majority voters, even if it's not weakly dominant as for $k = -1.5$, and majority voters will vote less and less sincerely as λ increases, as well but with a lower speed of convergence.

Figure 4 shows the probabilities associated with different levels of k for players in the minority. When k is greater than 0.5 (right plot in the lower part of the figure), the players in the minority group will vote more and more sincerely as λ increases. This is because when $k > 0.5$, voting sincerely strictly dominates voting strategically for the minority. When $k = 0.5$ (right plot in the lower part of the figure), voting sincerely weakly dominates voting strategically for the minority, but since the players in the majority group will vote sincerely more and more as λ increases, then the players in the minority will be indifferent between voting sincerely and strategically since they obtain the same utility (1). When k is included in the interval $(-0.5, 0.5)$, players in the minority group will vote more and more strategically as λ increases, since the players in the majority group will vote sincerely more and more as λ increases.

When $k = -0.5$, the game is again a version of a battle of the sexes game and players randomize with equal probability between voting red and green. When $k = -1.5$ (left plot in the upper part of the figure), voting strategically weakly dominates voting sincerely for minority voters, but since the players in the majority group will vote sincerely more and more as λ increases, then the players in the minority will be indifferent between voting sincerely and strategically since they obtain the same utility (0). For values of k included in the interval $(-1.5, -0.5)$, since the players in the majority group will vote sincerely less and less as λ increases, then players in the minority will be better off by voting sincerely.

Table 5 below presents our estimation results and statistical analysis when both k and λ are estimated.

Table 5: Complete Information QRE Estimations of k and λ					
	Payment Treatments				
Prob. Sincere Voting	No	Low	High	Combined	Combined Low & High
Majority Voters Obs.	0.97	0.98	1.00		
Majority Voters Est.	0.97	0.98	1.00		
Minority Voters Obs.	0.52	0.05	0.03		
Minority Voters Est.	0.52	0.05	0.03		
λ	2.02	3.43	9.80	2.93	3.94
k	0.48	-0.38	0.30	0.07	-0.41
log. likelihood	-57.69	-21.83	-8.87	-120.16	-32.35
χ^2 test statistic				-63.53	-3.29

In the QRE estimation both with constraining $k = 0$ and with k estimated with λ we find that we can reject the null hypothesis that voter behavior is unaffected by financial incentives at the 1% level of significance. And in the constrained estimation we can reject the null hypothesis of no difference between low and high payment treatments at the 5% level but not at the 1% level and with k estimated we can reject the null hypothesis of no difference between low and high payment treatments only at the 10% level. Thus, we find evidence that increasing financial incentives in the complete information case does not strongly affect behavior.

Our estimations which include k not surprisingly provide a better fit for the data than the case where $k = 0$, in the no and low payment treatments. That is, for the no and low payment treatments, the χ^2 comparison of the estimations where $k = 0$ with k estimated equal 14.63 and 8.83 which are significant at the 1% level, but in the high payment treatment this value equals 0.0068 which is not significant. This suggests that subjects did place an intrinsic value on voting their identities, but that this value was reduced when financial incentives were increased. Moreover, we find that higher financial incentives have a significant effect on the intrinsic value.

The Effect of Experience on Subjects' Behavior

Repetition within a Treatment In order to determine if experience within a particular payment treatment affected subject behavior we compared their choices in the first four periods with their behavior in the last four periods within each treatment (therefore if the treatment took place in periods 9-16 we compared periods 9-12 with periods 13-16). We find no significant evidence of learning in the treatments with financial incentives. We do find some evidence of

increased random behavior by subjects in the majority in the no payment treatment. The subjects in the first four periods of the treatment voted sincerely 100% of the time and 94% of the time in the last four periods which is significant at the 10% level [t-statistic = 1.77]. This effect is stronger when we restrict the analysis to the first eight periods of a session where subjects in the no payment treatment in the first half voted sincerely when in the majority 100% of the time compared to 88% of the time in the second half [t-statistic = 1.81].

These results suggest that when financial incentives were involved any learning that took place in a treatment took place early and the financial incentives that induced more strategic behavior of subjects in the minority were effective without much repetition or feedback. Furthermore, when financial incentives were not involved, subjects' behavior did not change much when in the minority, although there is evidence of some increase in random behavior, nonsincere voting, while in the majority.

Experience with Payments on Behavior in Unpaid Treatments We also consider the effects of experiencing payment treatments on behavior within the no payment treatment. We might imagine that subjects who have experienced a payment treatment would be more likely to have internalized the motivation given by the experimentor and continue to choose as they have in the payment treatment if the crowding out effect is permanent. On the otherhand, subjects who have experienced a payment treatment may return to their intrinsic motivations or resent not being paid, and make choices purposely at variant with what they perceive the experimentor prefers.

To determine if experience with payment results in unpaid subjects making choices similar to those paid, we compare the choices of unpaid subjects who have experienced payment treatments (subjects in group 2 in periods 17-24) with other subjects and themselves. We compare only their behavior when in the minority as there are no significant differences in voting choices when voters are in the majority across all treatments (they overwhelming vote sincerely). These subjects voted sincerely 38% of the time. We compare this percentage three ways:

1. Comparison with subjects in group 1 during periods 17-24 (subjects receiving high payment who have participated in the same number of elections): We find that when in the minority, these subjects vote sincerely 0% of the time. The difference is highly significant [t statistic = 3.00].

2. Comparison with subjects in groups 1 and 7 during periods 1-8 (unpaid subjects without experience with payments): These subjects voted sincerely 59% of the time,. The difference is insignificant [t statistic = 1.43].

3. Comparison with subjects in group 2 in earlier periods when they received payments: These subjects voted sincerely only 6% of the time. The difference is significant [t statistic = 2.36].

These results suggest that subjects tend to vote sincerely when in the minority that is crowded out by financial incentives, but re-emerges, although slightly less, when financial incentives are removed. The fact that paid subjects rarely voted sincerely when in the minority, suggests that those unpaid with payment experience cognitively understood the benefits of voting strategically, but chose not to do so. This could have been because they wished to vote sincerely or expressively, or because they wanted to thwart the experimentor's research, or they felt doing so would end the experiment earlier by not having to think about the distribution of voting types. Using only this data we cannot distinguish between these possible motivations.

Incomplete Information Treatments

Financial Incentives and Voting Behavior

Financial Incentives Versus No Incentives The voting behavior in the incomplete information treatments is presented in Table 6. First we find that voters who do not receive financial incentives vote sincerely 73-79% of the time regardless of the information they have on the other voters (subject behavior in the no payment treatment across information sets was not significantly different). Second, we find significant evidence that voters choose as predicted

by the coalition proof Bayesian Nash equilibrium when they receive financial incentives (subjects in information sets 1 and 2 are significantly more likely to vote sincerely than subjects in information set 3 in the low and high payment treatments).

Table 6: Voter Behavior in the Incomplete Information Games

Voter Information	Payment Type	Sincere Vote	Strategic Vote	Obs.
Two Same	None	74.07%	25.93%	27
	Low	86.36%	13.64%	22
	High	97.06%	2.94%	34
One Same	None	78.51%	21.49%	121
	Low	81.74%	18.26%	115
	High	88.42%	11.54%	104
Two Different	None	73.08%	26.92%	52
	Low	26.98%	73.02%	63
	High	22.58%	77.42%	62

Third, we find evidence that in the incomplete information voting games financial incentives increases the tendency to vote according to the coalition proof Bayesian Nash equilibrium prediction in information sets 1 and 3. Specifically, in the first information set when subjects should vote sincerely, we find that although a high percentage vote sincerely in the no payment treatment, 74%, in the low and high payment treatments combined subjects voted sincerely 93% of the time, a difference that is significant [t statistic = 2.03]. Similarly, in the third information set when subjects should vote strategically, we find that in the no payment treatment 73% vote sincerely, but in the low and high payment treatments combined only 25% vote sincerely [t statistic = 6.59]. However, in the second information set when subjects should also vote sincerely, we find no significant difference–in the no payment treatment 79% vote sincerely while in the low and high payment treatments combined 85% vote sincerely [t statistic = 1.44].

As in the complete information treatments, we compare voting behavior in the low and high payment treatments to determine if increasing financial incentives affects voter behavior. Although the likelihood of Bayesian-Nash predicted behavior increases with financial incentives, we find no significant difference in behavior by information set with comparing sincere voting in the low and high information treatments.[15]

As in the complete information game, a better evaluation of the behavior is afforded through the QRE estimation, particularly so in the case where voters are required to make inferences on limited information about the distribution of preferences. First we consider the QRE estimation when we constrain $k = 0$ (i.e. we assume that voters receive no intrinsic utility from voting their identity). Figure 5 and Table 7 present the results from this estimation.

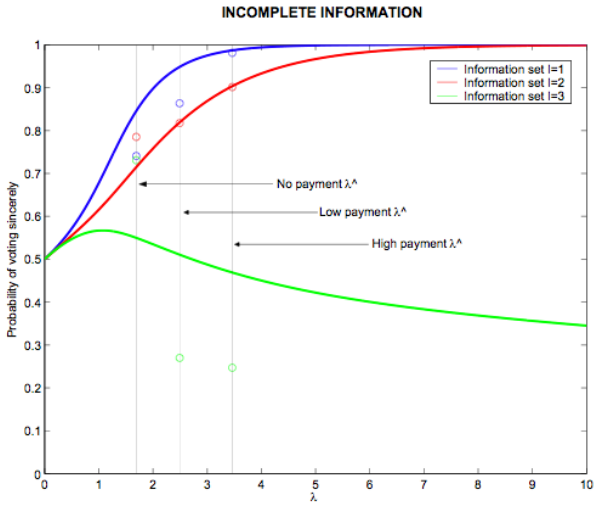

Figure 5: Incomplete Infor. QRE Est. with $k = 0$

Table 7: Incomplete Information QRE Estimations with $k = 0$

	Payment Treatments				
Prob. Sincere Voting	No	Low	High	Combined	Combined Low & High
Infor. Set 1 Obs.	0.74	0.86	0.97		
Infor. Set 1 Est.	0.85	0.95	0.99		
Infor. Set 2 Obs.	0.79	0.82	0.88		
Infor. Set 2 Est.	0.71	0.82	0.90		
Infor. Set 3 Obs.	0.73	0.27	0.23		
Infor. Set 3 Est.	0.55	0.51	0.47		
λ	1.69	2.49	3.46	2.39	2.90
log. likelihood	-114.86	-108.86	-83.15	-316.73	-194.27
χ^2 test statistic				-19.72	-4.52

Notice that in the QRE estimation in Information Set 3, voters who in the Bayesian-Nash equilibrium should vote strategically, actually are more likely to vote sincerely than strategically when the error rate for other voters is high. Nevertheless, in the no payment treatment these subjects vote sincerely at a higher rate than the estimated probability and in the low and high payment treatment they vote strategically at a higher rate than the estimated probabilities. As

in the case of the complete information treatment, we find that we can reject the null hypothesis that incentives have no effect on behavior at the 1% level. We can reject the null hypothesis that increasing payments from low to high has no effect at the 5% level, but not at the 1% level.

Figures 6, 7, 8, and 9 below present the QRE estimation with endogenous k as well as λ.

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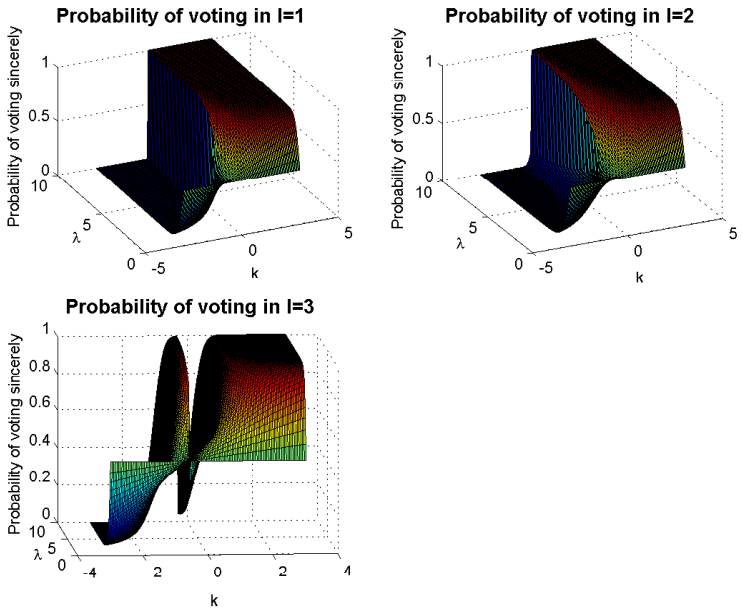

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Figure 6: Incomplete Infor. QRE Est. k and λ

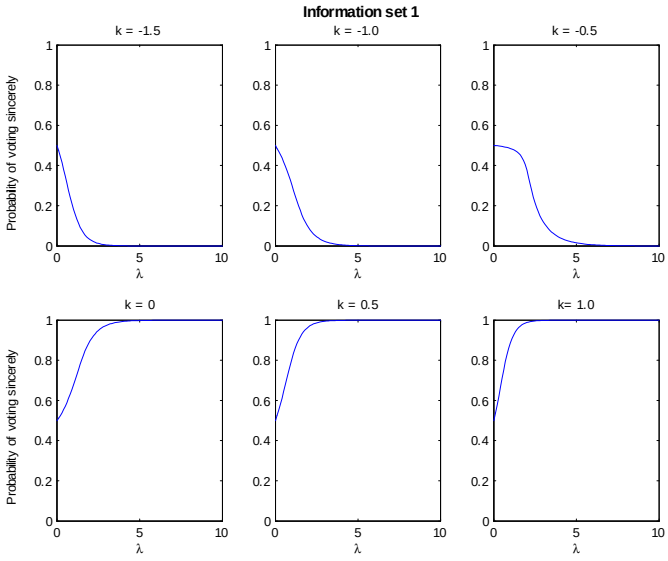

Figure 7: Infor. Set 1 Slices

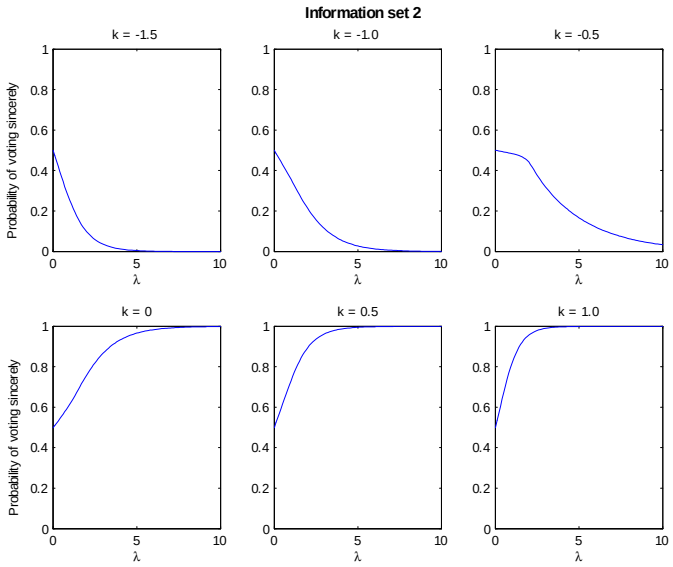

Figure 8: Infor. Set 2 Slices

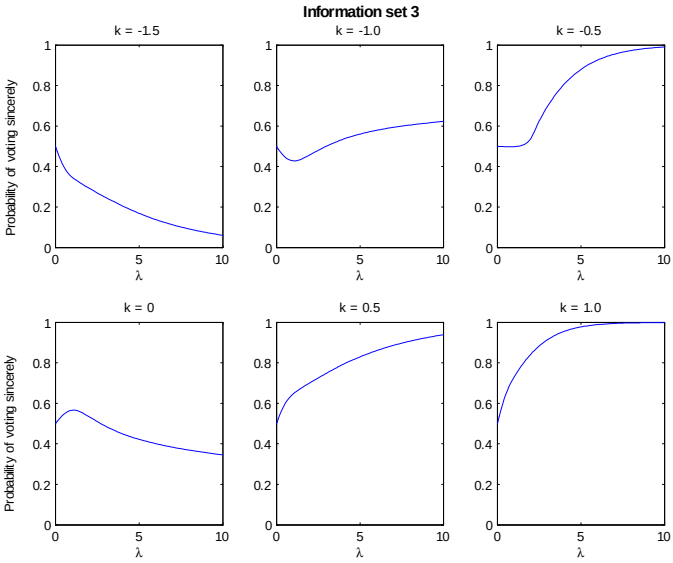

Figure 9: Infor. Set 3 Slices

As in the case of complete information, the game changes substantially as k changes leading to changes in strategies similar to those above. Table 8 summarizes the results of our empirical estimation and statistical analysis for the incomplete information game.

Table 8: Incomplete Information QRE Estimations of k and λ					
	Payment Treatments				
Prob. Sincere Voting	No	Low	High	Combined	Combined Low & High
Infor. Set 1 Obs.	0.74	0.86	0.97		
Infor. Set 1 Est.	0.78	0.96	1.00		
Infor. Set 2 Obs.	0.79	0.82	0.88		
Infor. Set 2 Est.	0.77	0.79	0.95		
Infor. Set 3 Obs.	0.73	0.27	0.23		
Infor. Set 3 Est.	0.75	0.29	0.43		
λ	0.18	3.64	4.55	2.85	3.94
k	6.08	-0.31	-0.28	-0.19	-0.35
log. likelihood	-109.01	-102.49	-75.30	-313.00	-179.73
χ^2 test statistic				-52.39	-3.89

In the QRE estimation with k estimated with λ we find that we can reject the null hypothesis that voter behavior is unaffected by financial incentives at the 1% level of significance and we can reject the null hypothesis of no difference between low and high payment treatments at the 5% level but not at the 1% level. Thus, we find evidence that increasing financial incentives in the incomplete information case does strongly affect behavior.

Our estimations which include k provide a better fit for the data than the case where $k = 0$, in all payment treatments. That is, the χ^2 comparison of the estimations where $k = 0$ with k estimated equal 11.69, 12.75, and 15.70 for the no, low, and high payment treatments respectively which are all significant at the 1% level. This suggests that subjects did place an intrinsic value on voting their identities, but that this value was reduced when financial incentives were increased. Moreover, we find that higher financial incentives have a significant effect on the intrinsic value.

The Effect of Experience on Subjects' Behavior

Repetition within a Treatment As with the complete information treatment, we divided each payment treatment into early and late halves and compared voting behavior for each information set in each payment treatment. First, we find no significant difference between the first and second halves of the high payment treatment in any of the information sets even when we restrict our analysis to the cases where subjects experienced the high payment treatment in

the first 8 periods.

Second, restricting our analysis to the low payment treatments that did not follow a high payment treatment, we find that in the low payment treatment, subjects in the second information set were more likely to vote as predicted in the second half of the treatment (75% in the first half and 88% in the second half, t statistic = 1.75), suggesting some learning. When we restrict our analysis to the groups who experienced the low payment treatment first, this difference is still there but no longer significant (75% of voters in this case voted as predicted in the first half and 93% in the second half, t statistic = 1.61). However, we find that these subjects who participate in the low payment treatment first demonstrate significant learning in the third information set (71% of voters voted as predicted in the first half of the treatment while 100% voted as prediced in the second half, t statistic = 2.28). Thus, repetition does appear to help subjects determine the optimal stategy in some cases when payment is at a typical level.

Third, in the no payment treatment we find no evidence of learning; we find no significant differences between the first and second halves of the treatments, even when we restrict our analysis to the first eight periods of a session (when subjects had no previous payment experience).

In summary, we find an apparent trade-off between size of payment and the benefit of repetition and feedback as well as some evidence of an interactive effect between payment and repetition. We find little change over time in subject behavior in the no payment treatment.

Experience with Payments on Behavior in Unpaid Treatments As in the complete information treatments, in some of the unpaid treatments subjects have experienced payments. Specifically, subjects in groups 4, 5, and 6 participated in paid treatments before participating in unpaid treatments.he subjects chose as predicted 62% by the coalition proof Bayesian Nash equilibrium 62% of the time in information set 1, 75% of the time in information set 2, and 15% of the time in information set 3. As above, to determine if experience with financial incentives affected their behavior we compare their choices to the choices of subjects who were unexperienced with payments, subjects who have participated in the same number of elections but were

paid, and their own choices in earlier paid treatments. Thus we conduct three comparisons:

1. We compare them with subjects who are in the same periods of the session but are paid. This involves two comparisons:

   (a) We compare group 5 with group 3 in periods 9-16 (that is, we compare subjects with low payment experience who are unpaid with subjects with unpaid experience who receive low payments). Unpaid experienced subjects in group 5 in these periods voted as predicted 100% of the time in information set 1, 92% of the time in information set 2, and 0% of the time in information set 3. These subjects thus tend to vote sincerely at high rates in information set 3 even though they have had some experience with financial incentives not to do so. We find that no significant difference between the choices of the paid subjects in the same periods in information sets 1 and 2. However, not surprisingly, we find that the paid subjects are significantly more likely to vote as predicted in information set 3. The paid subjects in these same periods voted as predicted 75% in information set 1 (t statistic = 1.00), 83% in information set 2 (t statistic = 0.95), and 92% in information set 3 (t statistic = 11.00).

   (b) We compare group 4 with groups 3, 5, and 6 in periods 17-24 (that is, we compare subjects who are unpaid in the last eight periods after having experienced payment with those who are paid in the last eight periods after having experienced both paid and unpaid treatments). In contrast to the unpaid experienced subjects in the middle periods, these unpaid experienced subjects in the last periods voted significantly less sincerely. They voted as predicted 29% of the time in information set 1, 42% in information set 2, and 57% in information set 3. This is also significantly different from the behavior of the paid subjects in the same periods in information sets 1 and 2, who voted as predicted 100% of the time in information set 1 (t statistic = 3.87), 89% of the time in information set 2 (t statistic = 4.37), and 89% of the time in information set 3 (t statistic = 1.55).

2. We compare them with unexperienced subjects in the no payment treatment (periods 1-8 in groups 3 and 4). We find that unpaid subjects who are experienced are *less* likely to choose as predicted by the coalition proof Bayesian Nash equilibrium than unpaid subjects who are unexperienced, although the difference is only significant for information set 3. Unexperienced subjects in the first information set who choose as predicted 86% of the time (t statistic = 1.42); unexperienced subjects in the second information set choose as predicted 83% of the time (t statistic = 1.07); and unexperienced subjects in the third information set choose as predicted 50% of the time (t statistic = 2.59).

3. Finally, we compare the experienced unpaid subjects' choices with their own choices in previous paid periods. This involves two comparisons:

   (a) We compare behavior in group 4 in periods 17-24 with their choices in periods 1-16 when they were paid. As noted these subjects voted as predicted 29% of the time in information set 1, 42% in information set 2, and 57% in information set 3 in periods 17-24. These choices are in sharp divergence from when these subjects were paid in earlier periods in the first two information sets. In the earlier paid periods, they voted as predicted 87% of the time in information set 1 (t statistic = 2.83), 78% of the time in information set 2 (t statistic = 2.95), and 68% of the time in information set 3 (t statistic = 1.13).

   (b) We compare behavior in groups 5 and 6 in periods 9-16 when they were unpaid with their choices in period 1-8 when they were paid. Subjects in groups 5 and 6 in the unpaid treatment chose as predicted 100% of the time in information set 1, 94% of the time in information set 2, and 4% of the time in information set 3. These choices are only significantly different from their choices in the previous paid periods for information set 3; in the earlier paid periods they chose as predicted 95% of the time in information set 1 (t statistic = 1.00), 85% of the time in information set 2 (t

statistic = 1.57), 90% of the time in information set 3 (t statistic = 16.03).

These results suggest that unpaid subjects with experience generally are more likely to vote sincerely than other subjects, especially in information set 3, except in the case where the unpaid treatment is the last treatment experienced. In this case the behavior of the subjects appears more random and unrelated to both previous behavior or financial incentives or sincerely expressing preferences.

Comparison Across Information Treatments

Our experimental design allows us to evaluate the effects of increasing complexity of the tasks before subjects on the effect of financial incentives. We classified subjects' vote choices as "rational" according to whether they followed the Bayesian-Nash predicted strategies for their information set in both the simple and complex games. A simple comparison shows not surprisingly that the percentage voting rationally across payment treatments in the complete information game, 91%, is significantly higher than the percentage voting rationally across payment treatments in the incomplete information game, 77% (t statistic = 6.57). We find similar significant differences when we compare by payment treatment.[16]

We also have within subjects comparisons of the effect of information for groups 10, 11, and 12. These subjects first experience the incomplete information game. We find similarly that they choose significantly more rationally in the complete information game overall (93% compared to 81%, t statistic = 2.93), although when we break down the comparisons by payment treatment, the difference is only significant for the low and high payment treatments.[17]

Tables 9 and 10 below presents the results of QRE estimation when we combine across information treatments. We find when we constrain $k = 0$ that the null hypothesis of no difference in the two information treatments cannot be rejected when there are no financial incentive payments, can be rejected at the 5% level in the low financial incentive treatment, and can be rejected at the 1% level in the high financial incentive treatment. This suggests that

the effects of financial incentives are stronger in the complete information treatment than in the incomplete information treatment.

When we estimate both k and λ simultaneously, we find that there is a significant difference at the 1% level in the zero payment treatment between the complete and incomplete information games FIX here. This last suggests that in the incomplete information game, subjects who receive no financial incentives are strongly intrinsically motivated to vote their identities, a tendency that quickly dissipates when financial incentives are introduced.

Table 9: Combined QRE Estimations with $k = 0$

	Payment Treatment				
Combined Infor.	None	Low	High	Comb.	Comb. Low & High
λ	1.77	2.87	3.46	2.56	3.31
Log Likelihood	-179.96	-137.76	-92.02	-438.64	-237.68
χ^2	-0.19	-5.32	-0.00	-63.30	-21.10

Table 10: Combined QRE Estimations of k and λ

	Payment Treatment				
Combined Infor.	None	Low	High	Comb.	Comb. Low & High
λ	1.61	3.54	4.61	2.63	3.94
k	0.49	-0.32	-0.54	-0.10	-0.35
Log Likelihood	-172.12	-124.48	-84.53	-436,56	-212.20
χ^2	-10.83	-0.31	-0.73	-122.74	-7.43

Concluding Remarks

Our experiments provide new evidence on the role of minimal group identities in influencing voter choices. We find that when voters have little at stake in the election (as in the case with zero financial incentives), identities can be a strong and significant influence on how they choose. However, financial incentives quickly reduce this effect and we find little evidence that voters are influenced by identities once they have a stake in the outcome of the election. This suggests that to the extent that voters who are mobilized in an election through group identities view their vote choice as inconsequential, then their vote choice, once in the ballot booth, may be highly influenced by their identity, even when encouraged to vote contrary to their identity.

We also find the effect of identity is related to the information that voters have about others preferences. When voters have incomplete information, coupled with little at stake, the influence

of identity is significantly stronger. This further suggests that voters who are less informed and mobilized to vote through group identity, may be even more likely to choose once in the ballot booth according to that identity. Our experiments thus provide strong support for identity based group voting in large elections.

Notes

[1]Early pure rational choice based theories were decision-theoretic and took the probability of being decisive as exogenous, see Riker and Ordeshook (1967). Later, game theoretic work, see Ledyard (1984) and Palfrey and Rosenthal (1983, 1985), show that it is possible for equilibria to exist where voting is positive in a purely rational choice model. However, as the electorate size increases, the pure rational choice based theories predict that turnout declines substantially. In a recent experimental test of the game theoretic approach, Levine and Palfrey (2007) demonstrate that the theory underpredicts turnout in large elections.

[2]See Morton (1987, 1991), Uhlaner (1989), and Schram (1991). Feddersen (2004) provides a recent review of the literature

[3]See Morton (2006, chapters 2 and 3) for a discussion of these efforts in recent U.S. elections.

[4]See Filer, Kenny, and Morton (1993), Shachar and Nalebuff (1999), and Coate and Conlin (2004).

[5]Of course, illegal methods exist of verifying and rewarding an individual's vote, particularly when voting is by mail or absentee. Our goal, though, is to explain the voting choices of the vast majority of participants in election who in large part do not vote by mail.

[6]Schuessler (2000) makes a related, although distinctive argument. He contends that voters choose to participate to express their preferences and choices and that candidates, parties, and interest groups use strategic tactics in their campaign messages to influence these preferences and thus voters' choices.

[7]See Tajfel (1970, 1981), Tajfel, Billig, and Bundy (1971), and Tajfel and Turner (1979).

[8]The argument that financial incentives can effectively induce subjects to be motivated as desired by the experimentor for theory evaluation is referred to as the labor theory of cognition [see Smith (1976, 1982) and Smith and Walker (1993)].

[9]Camerer and Hogarth (1999) and Hertwig and Ortmann (2001) review the literature on the effects of financial incentives in experiments generally. The only voting experiment that we know of in which financial incentives are compared with nonfinancial incentives is Kormendi and Plott (1982) who compare financial incentives with grade point incentives that varied with outcomes in a majority voting game with agenda setting. They find little difference between the two incentive mechanisms. They do not consider voter behavior in the absence of incentives, however.

[10]Subjects stayed within the same voting groups during a session, but were anonymous. That is, the experiment took place with a large number of subjects in the room and subjects did not know which subset were in their assigned groups.

[11]Although this was a slight deception, the probability that all five voters would be of the same type is equal to 0.031 and even in the longest sessions would be expected to occur on average once and unlikely at all in the shorter experimental sessions. We discuss how we deal with this issue in more detail in our discussion of voter information.

[12]See McKelvey and Palfrey (1995, 1996) and Goeree, Holt, and Palfrey (2005) for more information.

[13]We used Matlab to solve for these predictions. The code for the solutions is available from the authors.

[14]The t-statistic comparing sincere voting for voters in the majority in the no payment treatment with the low and high payment treatments combined is equal to 1.08 while the t-statistic comparing sincere voting for voters in the majority in the low payment treatment with the high payment treatment is equal to 1.42.

[15]The t-statistics for the comparisons of high and low payment sincere voting for information

sets 1, 2, and 3 are 1.33, 1.40, and 0.57 respectively.

[16]In the no payment treatment 78% vote rationally under complete information and 65% under incomplete information (t statistic = 2.74); in the low payment treatment 97% vote rationally under complete information and 80% under incomplete information (t statistic = 5.47); and in the high payment treatment 99% vote rationally under complete information and 87% under incomplete information (t statistic = 4.75).

[17]In the no payment treatment 80% vote rationally under complete information and 75% under incomplete information (t statistic = 0.53); in the low payment treatment 100% vote rationally under complete information and 85% under incomplete information (t statistic = 2.62); and in the high payment treatment 100% vote rationally under complete information and 83% under incomplete information (t statistic = 2.88).

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