THE EFFECT OF POLITICAL INFORMATION

ON DIRECT DEMOCRACY STRATEGIES AND OUTCOMES

Thesis by

Arthur William Lupia, Jr.

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DEDICATION

To my family,

Arthur, Judith, Salvatore, Veanne, William, Mae, Laura, Susan, Sara and Ramy

and in memory of

Frank and Josephine Lupia.

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ABSTRACT

The intent of the dissertation is to detail the effects of political information on participant strategies and outcomes in an electoral environment called "direct democracy." Direct democracy is a decision-making institution in which an agenda setter chooses an alternative to a pre-determined Status Quo and voters vote for either the Status Quo or the agenda setter's alternative. Through the use of a spatial election model, a survey of California insurance reform voters, and a series of laboratory experiments, I show how the direct democracy outcome corresponds to the underlying preferences of a majority of the electorate. The spatial model is used to establish that under conditions of incomplete information, the direct democracy outcome corresponds to the (full information) wishes of a majority of the electorate only when there are sufficient opportunities to cue off of the actions of other, credible, electoral participants. The empirical tools and experiments are used to examine electoral environments where different types of information are available. It is established that voters do not require full information in order to vote for their full information preferred alternative. It is also established that, in the absence of certain types of information, rational voters can cast votes for alternatives that lead to their least preferred outcome.

That voters do not require full information in order to vote for their full information preferred alternative suggests that voters do not necessarily need to understand an issue to vote in their own best interest. That rational voters can cast "*ex post* mistaken" votes under conditions of incomplete information implies that direct democracy outcomes can be manipulated by well-endowed interests. The dissertation details the conditions under which each of these outcomes is likely to occur.

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Introduction: The Electoral Subgame.

1.1 Purpose of the Dissertation.

The purpose of this dissertation is to explore some implications of the fact that elections are held under conditions of incomplete information. The fundamental idea is that the presence or absence of political information has an effect on voting behavior, the strategies of electoral contestants and electoral outcomes. I will employ both theoretical and empirical tools to show when, how and why information affects a particular class of elections that I call direct democracy.

In this dissertation, the term "direct democracy" corresponds to a situation where voters determine policy by voting for either a previously determined Status Quo or an alternative to the Status Quo proposed by either a legislative body or some other organized political entity. Note that the direct democracy election differs from the more commonly

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studied multi-candidate elections in that this election allows voters to choose among different policy alternatives as opposed to choosing individuals who will later negotiate a set of policy outcomes. The use of the term "direct democracy," in this paper, includes both the "referendum" and the "ballot initiative." The only distinction between these two election types is that "referenda" originate from within the government and "ballot initiatives" originate from outside the government. I use the general term in order to simplify exposition.

Those who argue in favor of direct democracy cite the fact that "decisions in which popular participation is unmediated ... produce more accurate expressions of will than do decisions in which they participate by electing others who make decisions for them [1]." Does this type of argument imply that the outcome of a direct democracy election will always correspond to the true preferences of a majority? Aside from problems in the definition of "majority preferences," answering this question in the affirmative must confront the fact that when issues are complex, voters must acquire information in order to understand the relationship between their preferences and possible direct democracy outcomes. The acquisition of information requires time and effort, both of which are scarce resources. This scarcity implies that voter participation in direct democracy is "mediated" by the cost of acquiring information. What does this imply about the correspondence between the "will of the majority" and direct democracy outcomes? It is my intent to establish and detail the effect that the existence of costly political information has on the strategies and outcomes that characterize policy making by direct democracy.

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[1] Butler and Ranney (1978), p. 24.

1.2 Information and Direct Democracy.

To better understand the relationship between direct democracy and the "will of the majority," let us now consider the effect of two important determinants of political outcomes – individual preferences and political information. Individual preferences are important determinants of voting behavior and electoral outcomes, but do not determine either in isolation. How a voter perceives the relationship between his preferred policy outcomes and possible electoral outcomes depends on certain characteristics of the political information he possesses. Consider the following informal example:

There exists a ballot measure that proposes to change the red stripes on the United States flag to green. Suppose, further, that the proposed change is not due to any underlying symbolism of the different colors - - rather, the change is reflective of mass boredom with a national symbol. To simplify the example, I assume that no one remembers the historical significance of the choice of the color RED or is particularly attached to notions of tradition, so that voters base their decisions only on their relative preference for the colors red and green. We can think of RED as the "Status Quo" and GREEN as an "alternative."

The effect of voter preferences on political strategies and outcomes, under full information, is singular and quite intuitive. In this example, if a voter likes red more than green, she votes for the SQ. If a voter likes green more than red, she votes for the alternative. In direct democracy, the vote is between "YES" and "NO" where:

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VOTE	Preference Indicated
Vote **YES**	Status Quo (SQ) preferred to Alternative (ALT)
Vote **NO**	Alternative (ALT) preferred to Status Quo (SQ)

The effect of political information on strategies and outcomes under full information is pluralistic and less intuitive, but at least as important, as the effect of individual preferences. To show the different effect that political information can have, let us assume that the "stripe" ballot measure is voted on by an incompletely informed electorate. In other words, the text of the measure is so complex, that voters are not certain which combination of colors ALT or SQ offer.

We first consider the effect of the *content* of information. If you are a voter whose favorite color is red, then the vote that you are more likely to cast upon hearing one of the following two statements from a single, truthful source may be different that the vote you are more likely to cast upon hearing the other.[2].

1. "The ALT will lead to a flag with *less* red in it than the SQ."

2. "The ALT will lead to a flag with *more* red in it than the SQ."

If you prefer red, then statement 1 may lead to an increased probability that you vote "NO," while statement 2 may lead to an increased probability that you vote "YES."

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[2]In this example, I assume that all information provided is truthful and costlessly verifiable. When either of these conditions are not met, the effect of information changes, as I show in Chapter 2, Section 7.1.

Content is not the only characteristic of information that can affect voting behavior. Consider the effect that the *amount* of information can have. Let's assume that you possess no information about the "stripe" ballot measure, or the Status Quo, and your priors lead you to believe that both alternatives are equally likely to result in a flag with more red in it. Now, on the way to the voting booth, you encounter ten of your friends, all of whom are equally credible. The following types of interaction may cause you to cast different votes.

- Five of your friends make statement 1 and five of your friends make statement 2.

- Nine of your friends make statement 1 and one of your friends make statement 2 (which should lead to an increase in the probability that you vote for the SQ).

- All ten of your friends make statement 2 (which should lead to an increase in the probability that you vote for the ALT).

Now, consider the effect that the *source* of information can have on voting behavior. The effect of the source of information is similar to the effect of partisan or ideological identification in multi-candidate elections. For instance, the information you can derive from a well known liberal's endorsement of a particular candidate is different from the information derived from an endorsement, of the same candidate, that comes from a well known conservative. A parallel, for our example, would be comparing what you could infer from statement 1 if it was made by the owner of a red ink factory with what you could infer from statement 1 if it was made by the owner of a green ink factory. In addition, the *distribution* of information within an electorate will affect the

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electoral outcomes. An electorate of fully informed voters can cast different votes than those with little or no information at all.

1.2.1 The Electoral Subgame.

Clearly, information is an important determinant of how direct democracy works. Since acquiring political information can be costly, some voters may choose to forego acquiring information in order to pursue other goals. In order to understand how direct democracy works under incomplete information, it might be helpful to think of this decision making process as an "electoral subgame," or a contest that is held as part of a larger contest. Voters allocate their resources to playing each subgame. For example, voters derive pleasure from home cooked meals, well-planned vacations, time with family, favorable electoral outcomes and many other things. Voters will choose to allocate their resources, physical and financial, to activities that they expect will improve their well being. That there exist limits on a voter's resources implies that some activities will not be executed thoroughly enough to yield theoretically most preferred outcomes.

Voters have low incentives to collect information since the probability that their vote is decisive approaches zero as the number of voters increases. That there are other entities in society who receive greater benefits from collecting and distributing information implies that the voter has even less of an incentive to obtain political information if he can "free ride" off of another person's information, thus transferring the costs of information acquisition away from himself. A vote for a particular alternative will lead to a voter's preferred outcome with certainty, only if the voter possesses full information about the relationship between his preferences and the possible outcomes. If the voter is uncertain about this relationship then he cannot ensure, *ex post*, that his vote will lead to a desired

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outcome. The more uncertain a voter is, the less likely it is that the voter's action will turn out to be correct.

What can we say about voters who vote against their own full information preferred alternative? We can say that casting a vote that leads *ex post* to a less preferred outcome does not necessarily imply that the voter is irrational and does imply that the voter should possibly have collected more information only if his vote was decisive. Only when we understand the circumstances under which voters will vote for their full information preferred alternatives, can we begin to say more about the necessary conditions for the casting of an *ex post* "correct" vote or can we evaluate the relationship between direct democracy outcomes and the "will of the majority."

1.3   A Research Agenda.

The dissertation is arranged as follows. In Chapter 2, I develop a spatial model of direct democracy. I then use the model to show the effects of different types of information on voter strategies, agenda setter strategies, and direct democracy outcomes. In the model, voters possess full information about the status quo and I vary the amount of information they have about the alternative. This model enables me to draw detailed, but generalizable conclusions about the relationship between political information and direct democracy strategies and outcomes.

To the extent that we can make generalizations through the use of spatial election models, we strengthen our claims of enhanced understanding when testing the model. In order to maximize the external validity of the model's implications, I test specific elements of it with empirical instruments. The findings of Chapter 2 are evaluated with the empirical explorations of Chapters 3 and 4. In Chapter 3, I describe the development, and present

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the results, of an exit poll designed to show how information affected California voters who were attempting to determine the future of insurance regulation in that state. This case study proves particularly valuable as it allows us to identify the distinct effects of different types of information. I find that the existence of multiple, credible and "interested" information providers is sufficient to allow incompletely informed voters to cast a vote for their full information preferred alternative. In Chapter 4, I describe the construction of, and present results from, a series of laboratory experiments that were designed to identify the effect of one particular type of information.

In at least one way, direct democracy provides us with a superior research tool for examining the interaction of voter preferences, political information and voting strategies. Voters in multi-candidate elections choose among potential office holders that later negotiate some uncertain set of policy outcomes. Direct democracy voters select directly among competing policy alternatives. Thus, all other factors held constant, direct democracy ballots ought to provide a clearer representation of an individual voter's preferences on a particular issue. If a voter's preferences affect voting differently than does a voter's political information, then our ability to identify the separate effects of preference and information, through both theoretical and empirical methods, will be enhanced by the presence of the relatively lucid direct democracy ballot. In fact, all of the empirical work included in the dissertation is based on the generation and examination of individual level direct democracy ballot data. This type of evidence provides a strong support for the external validity of the theoretical findings, which themselves are defined in terms of individual level behavior.

The fact that a direct democracy ballot is more representative of voter preferences over policy outcomes on a particular issue than are representative democracy ballots does not necessarily imply that the decision calculus underlying the direct democracy ballot is

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any easier to understand. The issues determined by direct democracy can be complex. Deciding among complex alternatives requires some amount of information. Political information can be a costly commodity and the incentives for individuals to collect political information can be quite small. If information can, in fact, affect voter behavior, agenda setter strategies and policy outcomes, then understanding the effect of information is an essential part of understanding direct democracy.

Bibliography

[1] Butler, David and Austin Ranney (1978). *Referendums: A Comparative Study of Practice and Theory*. Washington: American Enterprise Institute.

[2] Filimon, Radu, Thomas Romer and Howard Rosenthal (1982). "Asymmetric Information and Agenda Control: The Bases of Monopoly Power in Public Spending," *Journal of Public Economics*, 17, 51 - 70.

[3] Romer, Thomas and Howard Rosenthal (1978). "Political Resource Allocation, Controlled Agendas, and the Status Quo" *Public Choice*, Volume 33, 27 - 44.

[4] Romer, Thomas and Howard Rosenthal (1979a). "The Elusive Median Voter" *Journal of Public Economics*, Volume 7, 143 - 170.

[5] Romer, Thomas and Howard Rosenthal (1982a). "Median Voters or Budget Maximizers: Evidence from School Expenditure Referenda" *Economic Inquiry*, 20, 556 - 578.

[6] Rosenthal, Howard (1990). "The Setter Model" Mimeo, Carnegie-Mellon University.

Chapter 2

Direct Democracy, Political Information and "The Will of the Majority": A Spatial Model.

2.1 Introduction.

In this chapter, I develop a spatial election model of direct democracy in order to demonstrate the effect that different types of politically-generated information have on individual voter strategies, agenda setter strategies, and direct democracy outcomes. Supporters of direct democracy argue that direct democracy outcomes correspond to the "will of the majority".[1] Since direct democracy offers a binary choice to each voter, that the direct democracy outcome is the "stated preference" of a majority of voters is not in question. However, when voters are uncertain about the content of the electoral alternatives and,

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[1]Butler and Ranney (1978), Chapter 2.

therefore, uncertain about the relationship between their preferences and possible electoral outcomes, then the content, amount, source and distribution of political information will play an important role in determining the direct democracy outcome.

For instance, when voters possess incomplete information, they may vote for a different policy alternative than they would have if they were fully informed (and knew, with certainty, the outcomes related to each electoral alternative). I call such an action a "mistaken" vote. When a potentially decisive set of voters casts a set of "mistaken" votes, the direct democracy outcome may not be the *full information majority preferred alternative*[2] (i.e., the outcome, among those offered, that a majority of voters would have chosen if they were fully informed). When the full information majority preferred alternative is chosen, the median voter receives the maximum utility possible (given his or her choices). When the full information majority preferred alternative is not the direct democracy outcome, it is not clear that the "will of the majority" has been served. We must also consider the fact that policy agenda setters not only have their own preferences over outcomes but can also influence the political information that voters receive. If the agenda setter can influence voters' information and information affects voting behavior, then in order to better understand how direct democracy works, or to show the correspondence between the full information majority preferred alternative and the direct democracy outcome, it is necessary to understand how political information affects direct democracy.

The sequence of this chapter is as follows. Section 2 provides a review of relevant and influential literature. In Section 3, the foundations of the spatial model and preliminary results are established. In Section 4, electoral equilibria are found for six "game types" where each type is a variation of the general model that differs only in the information

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[2]Since the model is one-dimensional, the full information majority preferred alternative always exists (and, in fact is always the core or in the core).

that voters possess when it is their turn to vote. In Section 5, the effect of political information on direct democracy strategies and outcomes is discovered through the use of a comparative statics approach. Section 6 summarizes the findings, and Section 7 consists of a series of figures.

2.2   A Review of Why Information Matters.

Elections are used as instruments that convert individual preferences into policy outcomes. Elections that allow voters to choose among actual policy outcomes, as opposed to elections where voters choose legislators who negotiate policy outcomes, would seem to be a relatively straightforward method of converting preferences to outcomes. However, any such conversion is influenced by the procedure voters use to rank their electoral options. How a voter ranks a group of electoral alternatives depends on the information each voter possesses about the alternatives. Rankings can be influenced by the amount, content or source of a voter's information.[3] These characteristics of a voter's information will depend on the resources and incentives of those who are able to provide political information.

Direct democracy can be used to decide complex issues. Voters require information in order to evaluate complex issues. In large electorates, voters have little incentive to acquire political information. As established by Downs (1957) and detailed by Popkin, Gorman, Phillips and Smith (1976) political information is in many ways like a public good. The information that any single voter collects, and uses to choose a voting strategy, will affect everyone who is at all influenced by the electoral outcome. The public good quality of political information should, all other factors held constant, depress the expected value of information collection to each voter. In addition, the probability that a single voter can

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[3]For an example, see Chapter 1, Section 1.2.

affect the electoral outcome becomes quite small as the size of an electorate increases. This fact should cause an additional decrease in the expected value of information collection. As the expected value of information collection decreases, rational voters should either substitute other activities for information collection or attempt to decrease the cost of collection.

That voters may possess relatively small amounts of information does not imply that they cannot vote in their own best interests. McKelvey and Ordeshook (1984, 1985a, 1985b, 1986) devised two types of spatial two-candidate incomplete information models. In one model, voters possess retrospective and historical information about the candidates, know that there exists an issue space, and are provided with a truthful endorsement from an exogenous source. In a second model, voters are divided into subsets who either know, or do not know, the current policy positions of the candidates. Polls are administered and the uninformed voters are able to learn from the poll results. In both models, *incompletely informed voters are able to cue off of the low-cost information sources and can, in many cases, vote as if they possessed full information.* The direct democracy model developed in this chapter will provide roughly equivalent results even though the structure and intent of this model and the two-candidate models are quite different.

Voters can lower the cost of political information by relying on other entities who have a greater incentive to bear the cost of collecting information. While this reduces a voter's search costs, it also causes the usefulness of the low-cost information to be dependent on the voter's beliefs about the incentives of the information provider. When we consider the fact that the individuals or groups most affected by a particular direct democracy outcome have the greatest incentive to use their resources to influence the outcome, then understanding how the source of political information affects voting behavior becomes especially important. If the information that is made available by "interested" informa-

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tion providers affects how voters rank electoral alternatives, then those entities, which have both the incentive and the resources to influence the electoral outcome, will find it profitable to carefully select what type of information they provide.

Information providers, like car salesmen or courtroom attorneys, often have their own preferences over outcomes. The information that interested providers transmit should be selected to increase the likelihood that their own preferred alternative becomes the policy outcome. Milgrom and Roberts (1986) have studied the "information of interested parties" in a market setting. They show that when interested parties compete in the transmission of information, consumers are not necessarily required to acquire full information in order to make full information decisions.[4] That is, each interested party will reveal information that they believe will affect a consumer's priors. The information is selected to increase the consumer's estimate of the expected value of the information provider's product. In one-dimension, when multiple interested parties with conflicting incentives reveal all of the information that they expect will lead to their preferred outcome, all relevant information is revealed. Thus competition among information providers is sufficient to ensure that the consumer makes an *ex post* correct decision.

The extension of this result to electoral environments is quite straightforward.[5] If a "competition of political ideas" exists, the result should be better informed voters. In many electoral environments, however, the existence of either full information, or a "competition of ideas," can be easily challenged. The resource advantages of incumbents (campaign contributions, franking, relationships with elites, access to the media, etc.) in the United States are well documented.[6] Incumbents can use their resource advantage

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[4]For the dissertation, I define a "full information decision" as a decision that, given any additional information, the player would not choose to change.

[5]See Section 2.4.5 of this chapter.

[6]For instance see: Gary Jacobson, The Politics of Congressional Elections, (Boston: Little and Brown,

to influence the content of information that is available to voters who are looking for inexpensive cues. This influence is the greatest when the opponent has relatively small resources.

Following Olson (1965) we know that an organized special interest group will have an advantage in the ability to accumulate resources, which can be used for political purposes, over a diffuse and disorganized group. In the case of direct democracy, organizations that rally around a particular issue have an advantage over diffuse populations. The economies of scale that characterize collective action also can enhance an organization's attempts to extract benefits from the population. This advantage is particularly valuable if resources can affect certain characteristics of the available political information and that information, in turn, can affect direct democracy strategies and outcomes.

Asymmetric resources play an important role in direct democracy. Proposing and supporting a ballot initiative or referendum generally requires a substantial effort. Only those groups most affected by a particular issue should expect to receive a positive return from expending the resources necessary to propose and support an alternative to the status quo. Suppose that an individual, or group, has sufficient resources to either propose a ballot initiative or cause the proposal of a referendum. *If the same individual, or group, also has enough resources to influence the distribution of information to voters, then this individual, or group, could have a great influence on direct democracy outcomes, greater than the influence that is derived from agenda control or information provision alone.*

1983.), 25 - 37.

2.3   Foundations of a Direct Democracy Model.

In direct democracy, one of the electoral options, is selected by an endogenous entity, called the agenda setter. The effect of the agenda setter on policy outcomes is detailed in the "setter model" of Romer and Rosenthal (1978, 1979a, 1979b, 1982b). The Romer and Rosenthal model is a full information model that demonstrates when, why and how policy outcomes are affected by the presence of a monopoly agenda setter. In that model, the agenda setter has a utility function that is increasing in the size of a particular budget. The setter's preferences are common knowledge. The setter can propose different size budgets and voters can vote either "yes" or "no" on the proposal. If "no" receives more votes than "yes" then the budget size is determined by some pre-specified "reversion point." The resulting policy outcomes tend to be farther from the median voter's ideal point than is the case in the equivalent two-candidate competition model.[7]

The Romer and Rosenthal model is a full information model.[8] Note that the information asymmetries caused by the asymmetry in group resources cast doubt on the existence of a "competition of ideas" and full information. If information affects direct democracy, then the question "When do *majority preferred outcomes* result from the use of direct democracy?" cannot be answered completely using a full information model. That is why we offer an incomplete information model of direct democracy that not only shows how the presence of an agenda setter affects electoral outcomes, but also shows how information affects the process that I refer to as direct democracy, itself a more general concept than

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[7]Black (1958), Section 4.5.

[8]The setter model has been examined under different assumptions about the nature of incomplete information. In Romer and Rosenthal (1979b), the setter model is examined under conditions of uncertain turnout. In Morton (1988), voters condition their actions in the present period on anticipated setter actions in future periods.

the Romer and Rosenthal equivalent. While the structures of the models have many similarities, they are used to pursue different research agendas and differ in important ways. Unlike the Romer and Rosenthal model voters, in our model voters may not know the setter's preferences. Unlike the Romer and Rosenthal setter, this model's setter, in addition to his or her agenda setting powers, can determine, in part, the amount and content of the information that will be distributed to voters. While it is true that the original Romer and Rosenthal model is a special case of the model presented in this chapter, I should point out that my own research agenda is very different in intent and scope than Romer and Rosenthal's was. Thus, our model can both complement and broaden the relevance of that pioneering work.

2.3.1 Definition of the General Model.

I model direct democracy as a one period, multi-stage game of incomplete information. The object of the game is to choose one policy from a finite continuum of possible policy alternatives. One monopoly agenda setter, who is chosen at random from a population of potential agenda setters (and is, henceforth, referred to as "the setter"), can propose one alternative to a common knowledge status quo. The setter's willingness to propose an alternative is affected by an exogenously determined cost of contesting the election. After the setter moves, voters are then asked to vote for either the status quo, about which they are fully informed, or the setter's proposed alternative, about which they possess incomplete information. Some of the setter's actions, as well as changes in the underlying institutional structure, may provide additional information to voters about the alternative. I examine this model and find electoral equilibria under different assumptions about what information voters have and where that information comes from.

Consider the policy space $X \subseteq \Re$, a closed, convex interval. Let X be normalized so that we can represent the policy space by the interval $[0, 1]$:

$$X = [\ 0,\ 1\ ] \quad \text{normalized one-dimensional policy continuum}$$

In our model, there are $n + 1$ players where n of the players, $(N = \{1, \ldots, n\}$, n large, finite and odd), are called "voters" and one player, $J = \{0\}$, is called the "setter." The set of players in the model is, thus,

$$N' = N \cup J = \{0, 1, \ldots, n\}.$$

Nature draws player types from common knowledge distributions. We first denote the determination of the setter's type. Let $\chi_0 = [0, 1]$ be the set of possible setter types. Let $F : [0, 1] \rightarrow [0, 1]$, be the common knowledge cumulative distribution function of setter types, which has density f. That is, for any $X_0 \in \chi_0$,

$$F(X_0) = \int_0^{X_0} f(x)dx.$$

Nature draws once from this distribution. The draw determines $X_0 \in [0, 1]$, the agenda setter's type. In the model, the setter's type, X_0, is private information to her and the distribution F serves as the basis for all prior beliefs that voters have about the setter's type.[9] Since Nature draws only once from F, the distribution may not provide an accurate representation of the point, X_0.

We now denote the determination of voter types. Nature makes n independent draws from a single common knowledge distribution in order to determine each voter's type.

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[9]This representation of setter preferences allows a general representation of player prior beliefs. When F is uniformly distributed, voters will assume that all possible setter types can be drawn with equal probability. When F has all of its mass on one point, the voter's priors are fully informative (X_0 is common knowledge). A belief that referendum sponsors have a tendency towards extreme views can be represented by a density function $f(X_0)$ with two peaks, one near each endpoint of the policy space.

Let $\tau_i = [0,1]$ be the set of possible voter types. Let $G : [0,1] \to [0,1]$, be the common knowledge cumulative distribution function of setter types that have density g. That is, for any $T_i \in \tau_i$,

$$G(T_i) = \int_0^{T_i} g(t)dt.$$

$T_i, (i \in N)$, is voter i's type. While each voter's type, T_i, is private information to them, G is common knowledge. Thus, *all players know their own types* and *do not know any other voter's type*, but *do know the distribution from which other voter types are drawn.*

Nature simultaneously chooses the game type and the location of the "status quo" ($SQ \in [0,1]$) and announces them to all of the players. The game types that Nature can choose differ in either the actions that the setter and Nature are permitted to take or in the observations that voters can make. All players know the game type, with certainty, when it is their turn to choose a strategy.

After Nature determines player types and announces SQ and the game type, the setter chooses a strategy. The setter's strategy set, S_0, for each type of game follows.

Game Type	Setter Strategy Set
All	$S_0 = \{s_0 \mid \text{where } s_0 : \chi_0 \to \{0,1\} \times [0,1]\}$

The particular strategy chosen by the setter takes the form:

$$s_0(X_0) = (s_{01}(X_0), s_{02}(X_0)).$$

The setter's strategy, s_0, has two components. The first component of the strategy, $s_{01}(X_0)$, is whether or not to contest the election. In this model, the decision to contest the election is non-trivial because the setter will face a non-negative, common knowledge

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cost of entry, $K \in \Re^+$, if she decides to contest. We define the *setter's entry decision* as

$$s_{01}(X_0) \in \{0, 1\},$$

which equals 1 if the setter decides to contest the election, and equals 0 if the setter chooses not to contest the election. The second component of the setter's strategy, $s_{02}(X_0) \in [0, 1]$, is to choose a location for the "alternative to the status quo." If the setter decides not to contest the election, $(s_0(X_0) = (0, SQ))$, the game ends. For notational convenience, we denote $s_{02}(X_0) = SQ$, when $s_{01}(X_0) = 0$ (i.e. the setter chooses to accept SQ). Otherwise $s_{01}(X_0) = 1$, the setter enters and chooses $s_{02}(X_0)$.

After the setter moves, the voters choose a strategy. All actions taken by and all information obtained by voters are assumed to be costless to them. The voter strategy sets, $S_i (i \in N)$, in each type of game follow.

Game Type	Voter Strategy Set
NI, CE, EN_{ni}, EN_{ce}	$S_i := \{v_i \vert \text{where } v_i : \tau_i \times \{0, 1\} \times \{-1, 0, 1\} \quad \rightarrow \quad \{-1, 1\}\}$
LI, FI	$S_i := \{v_i \vert \text{where } v_i : \tau_i \times \{0, 1\} \times [0, 1] \quad\quad \rightarrow \quad \{-1, 1\}\}$

NI	No Information Transmitted
CE	Costly Setter Entry
EN_{ni}	Endorsement with costless entry
EN_{ce}	Endorsement with costly entry
LI	Learn Setter Ideal Point
FI	Full Information

In some of the game types, voters can condition their choice of strategy on information provided to them about $s_0(X_0)$. Let the space of possible messages be denoted as $\bar{M}$

where:

$$\bar{M} = \{0,1\} \times \{-1,0,1\} \quad \text{for NI, CE, EN}_{ni} \text{ and EN}_{ce}.$$

$$\bar{M} = \{0,1\} \times [0,1] \qquad \text{for LI and FI}.$$

For any $T_i \in \tau_i$, and $(M_1, M_2) \in \bar{M}$ the particular strategy chosen by voter i takes the form

$$v_i(T_i, M_1, M_2).$$

A voter's strategy is a binary decision, $v_i = \{-1, 1\}$, where $v_i = -1$ represents a vote for SQ and $v_i = 1$ represents a vote for $s_{02}(X_0)$. Voters observe the message $M(s_0, X_0) = (M_1(s_{01}(X_0)), M_2(s_{02}(X_0)))$. The value of $M(s_0, X_0)$ is revealed to voters after the setter chooses s_0 but before they vote. The first component of the message allows voters to observe whether or not the setter contests the election. For all game types: $M_1(s_{01}(X_0)) = s_{01}(X_0)$. The second component of the message allows voters to observe an *endorsement* and is defined as follows:

Game Type	$M_2(s_{02}(X_0)) =$
NI, CE	0
EN_{ni}, EN_{ce}	$\begin{cases} 1 & \text{if } SQ < s_{02}(X_0) \\ 0 & \text{if } SQ = s_{02}(X_0) \\ -1 & \text{if } s_{02}(X_0) < SQ \end{cases}$
LI	X_0
FI	$s_{02}(X_0)$

The endorsement, provided by Nature, gives voters additional information about the location of the alternative, $s_{02}(X_0)$. In EN$_{ni}$ and EN$_{ce}$ games, $M_2(s_{02}(X_0))$ tells voters

whether SQ or $s_{02}(X_0)$ is the left most alternative.[10] In the LI game, the endorsement allows us to simulate a situation where the voters know the setter's ideal point. In the FI game, the endorsement allows us to create a game of complete information that is consistent with the notation of incomplete information games. The endorsement is equivalent to the endorsement concept introduced in McKelvey and Ordeshook (1984, 1985b, 1986).

In all of the games, the winning outcome becomes the policy, where that outcome is determined as follows:

$$O : [0,1] \times \{-1,1\}^N \qquad \rightarrow \quad [0,1].$$

For any $x \in [0,1]$, $v_i \in \{-1,1\}$

$$o(x, v_1, \ldots, v_n) \quad = \quad x \qquad \text{if: } \sum_{i=1}^n v_i > 0$$

$$= \quad SQ \qquad \text{if: } \sum_{i=1}^n v_i \leq 0$$

The outcome $o(s_0, v_N(T_N, X_0))$ where

$$s_0 = \{s_{01}(X_0), s_{02}(X_0)\}, T_N = T_1, \ldots, T_N \text{ and } v_N = \{v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_1, M(s_0, X_0))\},$$

determines the payoffs to all players.[11] In this model, all players have symmetric and single peaked utility functions. The single peak in a player's utility function is called an "ideal point." The location of player ideal points on $[0,1]$ is a function of a player's type. In this paper, a player's type will only determine the location of their own ideal point.[12] Therefore, we denote $T_i \in [0,1]$ as voter $i's$ ideal point and $X_0 \in [0,1]$ as the setter's ideal

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[10]Since voters know the game type when it is their turn to vote, there is no confusion to them about the meaning of the message $M_2(s_{02}(X_0))$.

[11]We have assumed the SQ wins ties. This assumption is consistent with the tie-breaking rule used in all of the state and local level direct democracy electoral rules that the author is aware of.

[12]Thus, for this paper, voters are alike in every other way. Voter types will determine other parameters in extensions of this model.

point. Since a player's type is their own private information, then, so is the location of that player's ideal point. We define the *voter utility function*, $(U : \Re \times \tau_i \to \Re)$, for player $i \in N$ to be $\forall x \in [0,1]$, $\forall \ell \in (1, \inf)$ and $T_i \in \tau_i$.

$$U(x, T_i) = -(x - T_i)^\ell,$$

and the *setter utility function* to be

$$U(x, X_0) = -(x - X_0)^\ell.$$

Player *payoff functions* equal their utility minus any costs the players incur through their choice of strategy. Since all voter actions in this model are costless, the voter payoff and utility functions are equivalent. The setter's payoff function includes the cost of contesting the election. Cost $K \in \Re$ is incurred by the setter if and only if the setter decides to contest an election. The voter payoff function is:

$\phi_i(s_0, v_1, \ldots, v_n | X_0, T_1, \ldots, T_n) =$
$U_i[o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0))), T_i],$

and the setter payoff function is:

$\phi_i(s_0, v_1, \ldots, v_n | X_0, T_1, \ldots, T_n) =$
$U_0[o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0))), X_0] - K \times s_{01}(X_0).$

For voters, utility is solely a function of the distance between the location of the winning policy and their ideal point. Notice that the setter's utility function is not affected by winning or losing the election except for the influence that the electoral outcome has on the position of the winning policy. All utility functions have a lower bound over $[0, 1]$. In Table 1 is a summary of the sequence of events in the game. Table 2 provides a comparison of information parameters across game types.

Table 1 - The sequence of events in the game.

1. Nature determines the common knowledge: F, G, SQ and the game type.

2. Nature draws types: X_0 from F, and T_i from G, $\forall i \in N$.

3. All players observe their own types: 0 observes X_0, and $i \in N$ observes T_i.

4. 0 chooses $s_0(X_0)$.

5. All $i \in N$ observe $M(s_0, X_0)$.

6. Each $i \in N$ chooses $v_i(T_i, M(s_0, X_0))$.

7. $s_0, v_1, \ldots, v_N$ determine $o(s_{02}(X_0), v_N(T_N, X_0))$.

8. Players get payoffs: Voters receive $U_i(o(s_{02}(X_0), v_N(T_N, X_0)))$. and the setter receives $U_0(o(s_{02}(X_0), v_N(T_N, X_0))) - (K \times s_{01}(X_0))$.

9. The game ends.

Table 2 - Information Parameters

TYPE	Symbol	$K > 0$	Endorsement	Voters See	
				X_0	$s_{02}(X_0)$
No Information	NI	N	N	N	N
Costly Entry	CE	Y	N	N	N
Endorsement	EN_{ni}	N	Y	N	N
Cost & Endor.	EN_{ce}	Y	Y	N	N
Learn SIP*	LI	N	Y	Y	N
Full Information**	FI	N	Y	Y	Y

Y	is a characteristic of the game type
N	is not a characteristic of the game type
	application of Milgrom and Roberts (1987)
*	similar to Romer and Rosenthal (1978, 1979)

2.3.2 The Definition of the Equilibrium.

To characterize voter strategies, setter strategies, and the direct democracy outcome, I utilize a Bayesian type equilibrium concept. We will define the equilibrium by stating the Bayes-Nash equilibrium for this game and then incorporating the assumptions of this

model into the Bayes-Nash statement. $\forall (k,j) \in \bar{M}$, let

$$A(k,j) = \{X_0 : s_{01}(X_0) = k, \text{ and } M_2(s_{02}(X_0)) = j\}$$

be the set of all setter types that send message $M(s_0, X_0) = (k,j)$.

In a Bayes-Nash equilibrium, $\forall X_0 \in \chi_0$, the setter chooses $s_0(X_0) \in \{0,1\} \times [0,1]$ to maximize:

$$\int \phi_0(s_0, v_1, \ldots, v_n | X_0, T_1, \ldots, T_n) dG(T_1) \ldots dG(T_n),$$

and each voter, $i \in N$ and $T_i \in \tau_i$, i chooses $v_i(T_i)$ to maximize:

$$\int \phi_i(s_0, v_i, v_{-i} | X_0, T_1, T_{-i}) dF(X_0) dG(T_{-i}).$$

The first difference between our equilibrium concept and Bayes-Nash is that we assume voters always vote as if they are the pivotal voter (i.e., they adopt strategies that are weakly dominant with respect to the strategies of other voters.) That is, $v_i^* \in S_i$ is weakly dominant if $\forall v_i \in S_i, v_{-i} \in S_{-i}, s_0 \in S_0, T_i \in \tau_i$ and $T_{-i} \in \tau_{-i}$

$$\int \phi_i(s_0, v_i^*, v_{-i} | X_0, T_i, T_{-i}) dF(X_0) \geq \int \phi_i(s_0, v_i, v_{-i} | X_0, T_i, T_{-i}) dF(X_0),$$

with strict inequality for some T_i, T_{-i}, v_{-i}, and s_0. If v_I^* is dominant, it must be the case that

$$\int U_i(o(s_{02}(X_0), v_i^*(T_i, M(s_0, X_0)), v_{-i}(T_{-i}, M(s_0, X_0))), T_i) dF(X_0)$$

$$\geq \int U_i(o(s_{02}(X_0), v_i(T_i, M(s_0, X_0)), v_{-i}(T_{-i}, M(s_0, X_0))), T_i) dF(X_0)$$

with sometimes strict inequality, which implies:

$$\sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i(o(s_{02}(X_0), v_i^*(T_i, j, k), v_{-i}(T_{-i}, j, k)), T_i) dF(X_0)$$

$$\geq \sum_{(j,k) \in \bar{M}} \int_{A(j,k)} U_i(o(s_{02}(X_0), v_i(T_i, j, k), v_{-i}(T_{-i}, j, k)), T_i) dF(X_0)$$

Note that for all $v_{-i} \in S_{-i}$ and $T_{-i} \in \tau_{-i}$, i can only affect the outcome of the election if:

$$\sum_{i' \in (N-i)} v_{i'}(T_{i'}, (j,k)) = 0.$$

In this case:

$$o(s_0(X_0), v_i(T_i, M(j,k))) = \begin{cases} s_{02}(X_0) & \text{if } v_i = 1 \\ SQ & \text{if } v_i = -1. \end{cases}$$

So, $v_i = \begin{cases} 1 & \text{if } \int_{A(j,k)} U_i(s_{02}(X_0), T_i)dF(X_0) > \int_{A(j,k)} U_i(SQ, T_i)dF(X_0) \\ -1 & \text{if } \int_{A(j,k)} U_i(s_{02}(X_0), T_i)dF(X_0) \le \int_{A(j,k)} U_i(SQ, T_i)dF(X_0). \end{cases}$

is a dominant strategy for voter i. But v_i can be rewritten as:

$$v_i = \begin{cases} 1 & \text{if } \int_{A(j,k)} U_i(s_0(X_0), T_i)dF(X_0) > U_i(SQ, T_i) \int_{A(j,k)} dF(X_0) \\ -1 & \text{if } \int_{A(j,k)} U_i(s_0(X_0), T_i)dF(X_0) \le U_i(SQ, T_i) \int_{A(j,k)} dF(X_0) \end{cases}$$

$$v_i = \begin{cases} 1 & \text{if } \int_0^1 U_i(s_0(X_0), T_i)dF(X_0|j,k) > U_i(SQ, T_i) \\ -1 & \text{if } \int_0^1 U_i(s_0(X_0), T_i)dF(X_0|j,k) \le U_i(SQ, T_i), \end{cases}$$

where $f(X_0|k,j)) = \begin{cases} \frac{f(x)}{pr(k,j)} & \text{if } x \in A(k,j) \\ 0 & \text{otherwise} \end{cases}$

We can therefore restate the equilibrium concept for the direct democracy model, which is now more similar to the sequential equilibrium concept of Kreps and Wilson (1982) than Bayes-Nash, as a set of strategies $s_0 \in S_0, v_i \in S_i$, and voter beliefs $f(X_0|k,j)$, such that for each $(k,j) \in \bar{M}$:

Setter:	$\forall X_0$, $s_0(X_0) = (s_{01}(X_0), s_{02}(X_0))$ satisfies: $\max_{s_0 \in \{0,1\} \times [0,1]}$ $$\int [U_0(o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0)), X_0) - (K \times s_{01}(X_0))]$$ $$dG(T_1), \cdots, dG(T_n)$$
Voters:	$\forall T_i$, $(i \in N)$, and $\forall (k,j) \in \bar{M}$, $v_i(T_i, k, j)$ satisfies: $$v_i = 1 \text{ if } \int_0^1 U_i(s_{02}(X_0), T_i) dF(X_0 | k, j) > U_i(SQ, T_i)$$ $$v_i = -1 \text{ otherwise}$$
Beliefs:	$\forall (k,j) \in \bar{M} : f(X|k,j)) = \begin{cases} \frac{f(x)}{pr(k,j)} & \text{if } x \in A(k,j) \\ 0 & \text{otherwise} \end{cases}$ where $pr(k,j) = \int_{A_{(k,j)}} F(x) dx$.

We have assumed that N is large, finite and odd. If we allow N to be infinite, a good approximation of N large and finite, then we can redefine and simplify the setter's optimization problem in the following manner. In a Bayes-Nash equilibrium, $\forall X_0 \in \chi_0$, the setter chooses $s_0(X_0) \in \{0,1\} \times [0,1]$ to maximize:

$$\int [U_0(o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0)), X_0) - (K \times s_{01}(X_0))]$$

$$dG(T_1), \cdots, dG(T_n)$$

$$= \int_{\{(T_1,\ldots,T_n):\sum v_i(T_i, M(s_0, X_0))>0\}} [U_0(s_{02}(X_0), X_0) - (K \times s_{01}(X_0))] \, dG(T_1), \cdots, dG(T_n)$$

$$+ \int_{\{(T_1,\ldots,T_n):\sum v_i(T_i, M(s_0, X_0))\leq 0\}} [U_0(SQ, X_0) - (K \times s_{01}(X_0))] \, dG(T_1), \cdots, dG(T_n)$$

$$= [U_0(s_{02}(X_0), X_0) - (K \times s_{01}(X_0))] \int_{\{(T_1,\ldots,T_n):\sum v_i(T_i, M(s_0, X_0))>0\}} dG(T_1), \cdots, dG(T_n)$$

$$+ [U_0(SQ, X_0) - (K \times s_{01}(X_0))] \int_{\{(T_1,\ldots,T_n):\sum v_i(T_i, M(s_0, X_0))\leq 0\}} dG(T_1), \cdots, dG(T_n)$$

Now, $\forall M(s_0, X_0) \in \bar{M}$ and $s_0 \in S_0$, let:

$$C(SQ, M(s_0, X_0)) = \{T_i \in [0, 1] :$$

$$\int_0^1 U_i(s_{02}(X_0), T_i) dF(X_0 | M(s_0, X_0)) \leq U_i(SQ, T_i)\}, \text{ and,}$$

$$C(s_{02}(X_0), M(s_0, X_0)) = [0, 1] - C(SQ, M(s_0, X_0)).$$

$C(SQ, M(s_0, X_0))$ is the set of voter types that receive expected utility from the SQ that is greater than or equal to the expected utility from the lottery of setter types sending message $M(s_0, X_0)$.[13] $C(s_{02}(X_0), M(s_0, X_0))$ is the set of voter types that receive higher expected utility from the lottery of setter types sending message $M(s_0, X_0)$ than from SQ.

Then,

$$pr[v_i(T_i, M(s_0, X_0))] > 0 = pr[\int_0^1 U_i(s_{02}(X_0), T_i) dF(X_0 | M(s_0, X_0)) > U_i(SQ, T_i)]$$

$$= pr[T_i \in C(s_{02}(X_0), M(s_0, X_0))]$$

$$= \int_{C(SQ, M(s_0, X_0))} dG(T)$$

Since $\forall i, v_i(T_i, M(s_0, X_0))$ are independent and identically distributed, then $\forall i \in N$:

$$v_i = \begin{cases} 1 & \text{with probability } pr[T_i \in C(s_{02}(X_0), M(s_0, X_0))] = p \\ -1 & \text{with probability } pr[T_i \in C(s_{02}(X_0), M(s_0, X_0))] = (1-p) \end{cases}$$

So, by the law of large numbers, as n increases:

$$\sum_{i=1}^n v_i(T_i, M(s_0, X_0)) \to p + (1-p) = 2p - 1.$$

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[13]The set of voters who are indifferent is, theoretically, of measure zero, but is included in the set for notational consistency.

Hence,

$$pr[\sum_{i=1}^{n} v_i(T_i, M(s_0, X_0) > 0] \quad \rightarrow \quad 1 \text{ if } p > \frac{1}{2}$$

$$pr[\sum_{i=1}^{n} v_i(T_i, M(s_0, X_0) = 0] \quad \rightarrow \quad 1 \text{ if } p = \frac{1}{2}$$

$$pr[\sum_{i=1}^{n} v_i(T_i, M(s_0, X_0) < 0] \quad \rightarrow \quad 1 \text{ if } p < \frac{1}{2}.$$

We can, for any $X_0 \in \chi_0$, redefine the setter's optimization problem as follows. *Choose*

$s_0(X_0) = (s_{01}(X_0), s_{02}(X_0))$ *to maximize:*

$$\Phi_0(s_0, M(s_0, X_0)|X_0) = \begin{cases} U_0(SQ, X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) < \frac{1}{2} \end{cases}$$

The equilibrium concept used in this paper can now be defined as as a set of strategies

$s_0 \in S_0, v_i \in S_i$, and voter beliefs $f(X_0|k, j)$, such that for each $(k, j) \in \bar{M}$:

Setter: $\quad \forall X_0, s_0(X_0) = (s_{01}(X_0), s_{02}(X_0))$ satisfies: $\max_{s_0 \in \{0,1\} \times [0,1]}$

$$\Phi_0(s_0, M(s_0, X_0)|X_0) = \begin{cases} U_0(SQ, X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) < \frac{1}{2} \end{cases}$$

Voters: $\quad \forall T_i, (i \in N)$, and $\forall (k, j) \in \bar{M}, v_i(T_i, k, j)$ satisfies:

$v_i = 1$ if $\int_0^1 U_i(s_{02}(X_0), T_i) dF(X_0|k, j) > U_i(SQ, T_i)$

$v_i = -1$ otherwise

Beliefs:[14] $\quad \forall (k, j) \in \bar{M} : f(X|k, j)) = \begin{cases} \frac{f(x)}{pr(k,j)} & \text{if } x \in A(k, j) \\ 0 & \text{otherwise} \end{cases}$

where $pr(k, j) = \int_{A_{(k,j)}} F(x) dx.$

Having defined what an equilibrium to this game is, we now establish that the following

are equilibrium strategies for all of the $(II = \{NI, CE, EN_{ni}, EN_{ce}, LI\})$ incomplete

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information game types:

1. **The setter maximizes her payoff by contesting an election only when she expects a positive return from doing so.**

2. **If voters are uncertain about the location of $s_{02}(X_0)$ when it is their turn to vote, the setter's equilibrium strategy is to choose her ideal point as the alternative.**

3. **Voters cast votes that maximize *ex ante* expected utility.**

We first establish the setter's equilibrium entry decision. The setter will condition her decision to enter on both the benefit of contesting the election, in terms of increased utility, and the probability of winning the election. Lemma 1 establishes that the setter contests an election if and only if she expects to win and the benefit from an election victory is greater than the cost of contesting the election.

Lemma 1 *In all game types of this chapter,*

$$\forall X_0 \in \chi_0 : s_0(X_0) = (1, s_{02}(X_0)) \ dominates \ s_0'(X_0) = (0, s_{02}(X_0))$$

$$\iff \Phi_0(s_0, M(s_0, X_0)|X_0) \geq \Phi_0(s_0', M(s_0', X_0)|X_0).$$

Proof:

By the fact that $s_{01}(X_0) = 0 \implies s_{02}(X_0) = SQ$, we have

$$\Phi_0(s_0', M(s_0', X_0)|X_0) = U_0(SQ, X_0).$$

Thus, when $\Phi_0(s_0, M(s_0, X_0)|X_0) \geq U_0(SQ, X_0)$, $s_0(X_0) = (1, s_{02}(X_0))$ dominates $s_0'(X_0) = (0, s_{02}(X_0)) = (0, SQ)$. From the definition of $\Phi_0(s_0, M(s_0, X_0)|X_0)$, we know that if

$s_0(X_0) = (1, s_{02}(X_0))$ dominates $s_0'(X_0) = (0, s_{02}(X_0))$, then it must be the case that $\Phi_0(s_0, M(s_0, X_0)|X_0) \geq \Phi_0(s_0', M(s_0', X_0)|X_0)$.

QED.

From Lemma 1, we know that the setter chooses and the voters observe the following values:

Setter Entry Rule ($\forall X_0 \in \chi_0, s_0 \in S_0, M(s_0, X_0) \in \bar{M}$):

If $\Phi_0(s_0, M(s_0, X_0)|X_0) \geq U_0(SQ, X_0) \implies s_{01}(X_0) = 1$ contest the election

If $\Phi_0(s_0, M(s_0, X_0)|X_0) < U_0(SQ, X_0) \implies s_{01}(X_0) = 0$ do not contest the election

---

We now establish the setter's equilibrium location strategy for the II (Incomplete Information) games. Lemma 2 establishes that if voters are uncertain about the location of the alternative when it is time for them to vote, then a dominant strategy for the setter is to choose her ideal point as the location of the alternative.

Lemma 2 *In the class of II (Incomplete Information) games, a weakly dominant location strategy for the setter is $s_{02}(X_0) = X_0$.*

Proof:

The setter's choice of strategy relays a message to voters. Voters condition their choice on the message $M(s_0, X_0) \in \bar{M}$, $M(s_0, X_0) = (s_{01}(X_0), M_2(s_{02}(X_0)))$. We now establish the dominance of the strategy $s_{02}(X_0) = X_0$ in each II game type. Consider the following five cases.

1. From the definition of the NI game and Lemma 1, the setter sends only one type of message, $M(s_0, X_0) = (1, 0)$. (The setter always (costlessly) enters and Nature does

not provide an endorsement.) In this case, where $K = 0$, the setter chooses $s_0(X_0)$ to maximize:

$$\Phi_0(s_0, M(s_0, X_0)|X_0) = \Phi_0((1, s_{02}), (1, 0)|X_0) = \begin{cases} U_0(SQ, X_0) & \text{if } \int_{C(SQ,1,0)} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) & \text{if } \int_{C(SQ,1,0)} dG(T) < \frac{1}{2} \end{cases}$$

If $\int_{C(SQ,1,0)} dG(T) \geq \frac{1}{2}$, then $\Phi_0((1, s_{02}), (1, 0)|X_0) = U_0(SQ, X_0)$, independent of $s_{02}(X_0)$. If $\int_{C(SQ,1,0)} dG(T) < \frac{1}{2}$, then, $\Phi_0((1, s_{02}), (1, 0)|X_0)$ is maximized when $s_{02}(X_0) = X_0$. Therefore, since U_0 is maximized at $s_{02}(X_0) = X_0$ independent of the value of $\int_{C(SQ,1,0)} dG(T)$, this strategy is weakly dominant for the setter in the NI game.

2. In the CE game, the setter can send one of two messages, $M(s_0, X_0) \in \{(0, 0), (1, 0)\}$. (The setter either enters or does not and Nature does not provide an endorsement.) If $M(s_0, X_0) = (1, 0)$, (i.e., $s_{01}(X_0) = 1$), then $\Phi_0((1, s_{02}), (1, 0)|X_0)$ is maximized by $s_{02}(X_0) = X_0$, as was shown in case 1 of this proof. Note that the value of $\Phi_0((0, s_{02}), (0, 0)|X_0)$, the setter's payoff when the election is not contested, is not affected by $s_{02}(X_0)$.

$$\Phi_0((0, s_{02}), (0, 0)|X_0) = U_0(SQ, X_0) - (K \times 0).$$

Therefore, $s_{02}(X_0) = X_0$ is weakly dominant for the setter in the CE game.

3. From the definition of the EN_{ni} game and Lemma 1, the setter can send one of three messages, $M(s_0, X_0) \in \{(1, -1), (1, 0), (1, 1)\}$. (The setter always (costlessly) enters and Nature provides an endorsement.) The setter chooses $s_0(X_0)$ to maximize (where $K = 0$):

$$\Phi_0(s_0, M(s_0, X_0)|X_0) = \begin{cases} \Phi_0((1, s_{02}), (1, 1)|X_0) & \text{if } SQ < s_{02}(X_0) \\ \Phi_0((1, s_{02}), (1, 0)|X_0) & \text{if } SQ = s_{02}(X_0) \\ \Phi_0((1, s_{02}), (1, -1)|X_0) & \text{if } s_{02}(X_0) < SQ \end{cases}$$

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$$\Phi_0((1, s_{02}), (1,1)|X_0) = \begin{cases} U_0(SQ, X_0) & \text{if } \int_{C(SQ,1,1)} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) & \text{if } \int_{C(SQ,1,1)} dG(t) < \frac{1}{2} \end{cases}$$

$$\Phi_0((1, s_{02}), (1,0)|X_0) = U_0(SQ, X_0)$$

$$\Phi_0((1, s_{02}), (1,-1)|X_0) = \begin{cases} U_0(SQ, X_0) & \text{if } \int_{C(SQ,1,-1)} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) & \text{if } \int_{C(SQ,1,-1)} dG(t) < \frac{1}{2} \end{cases}$$

Consider the following two subcases:

(a) $s'_{02}(X_0) \neq X_0$ and $s_{02}(X_0) = X_0$, where $s'_0 = (s_{01}(X_0), s_{02}(X_0))$ and $s_0 = (s_{01}(X_0), X_0)$, and $M(s'_0, X_0) = M(s_0, X_0)$. If $s'_{02}(X_0) \neq X_0$ then $U_0(X_0, X_0) > U_0(s'_{02}(X_0), X_0)$ which implies

$$\Phi_0(s_0, M(s_0, X_0)|X_0) \geq \Phi_0(s'_0, M(s'_0, X_0)|X_0).$$

(That is, since $M_2(s_{02}(X_0) = X_0) = M_2(s_{02}(X_0) \neq X_0)$, voters cannot differentiate amongst the setter types that would send each message.) Thus, $s_{02}(X_0) = X_0$ is a weakly dominant setter location strategy for the NE_{ni} game when $M_2(s_{02}(X_0)) = M_2(s_{02}(X_0))$.

(b) $s_{02}(X_0) \neq X_0$ and $M_2(s_{02}(X_0)) \neq M_2(X_0)$. Thus, $s_{02}(X_0) \neq SQ$.

$$\text{Let } s'_{02}(X_0) = \frac{s_{02}(X_0) + SQ}{2}.$$

$M_2(s_{02}(X_0)) \neq M_2(X_0)$ implies that X_0 and $s_{02}(X_0)$ are on opposite sides of SQ. Thus, any $s'_{02}(X_0)$ that is closer to SQ gives higher utility to the setter: $U_0(s'_{02}(X_0), X_0) > U_0(s_{02}(X_0), X_0)$. So, changing from $s_{02}(X_0)$ to $s'_{02}(X_0)$ gives the setter a higher payoff.

$$\Phi_0(s_0, M(s_0, X_0)|X_0) \geq \Phi_0(s'_0, M(s'_0, X_0)|X_0).$$

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Thus, $s_{02}(X_0)$ cannot be an equilibrium partial strategy.

From Case A and Case B, we have established that $s_{02}(X_0) = X_0$ is a weakly dominant location strategy for the setter in the EN_{ni} game.

4. In the EN_{ce} case, the setter can send one of six messages,

$$M(s_0, X_0) \in \{(0, -1), (0, 0), (0, 1), (1, -1), (1, 0), (1, 1)\}.$$

(The setter either enters or does not and Nature provides an endorsement.) Notice that $\Phi_0((0, s_{02}), (0, -1)|X_0) = \Phi_0((0, s_{02}), (0, 0)|X_0) = \Phi_0((0, s_{02}), (0, 1)|X_0) = \Phi_0((1, s_{02}), (1, 0)|X_0) = \Phi_0((0, s_{02}), (0, 0)|X_0)$, $[s_{01}(X_0) = 0 \implies o(s_{02}(X_0), v_N) = -1$ (SQ wins)]. Since $s_{02}(X_0) = X_0$ has previously been established as providing the highest payoff for $\Phi_0((0, s_{02}), (0, 0)|X_0)$, $\Phi_0((1, s_{02}), (1, -1)|X_0)$ and $\Phi_0((1, s_{02}), (1, 1)|X_0)$, then $s_{02}(X_0) = X_0$ is a weakly dominant location strategy for the setter in the EN_{ce} game.

5. In the LI game, the definition of the endorsement changes. $\bar{M} = \{0, 1\} \times [0, 1]$ is the space of LI game messages. $M_2(s_{02}(X_0)) = X_0$ is the LI endorsement. It is assumed that $K = 0$ for the LI game.[15] Define $\forall s_0 \in S_0$:

$$C'(SQ, M(s_0, X_0)) = \{T_i \in [0, 1] : U_i(s_{02}(X_0), T_i) \leq U_i(SQ, T_i)\}, \text{and},$$

$$C'(s_{02}(X_0), M(s_0, X_0)) = [0, 1] - C'(SQ, M(s_0, X_0)).$$

Then we can define the setter's objective function for the LI game as:

$$\Phi_0'(s_0, M(s_0, X_0)|X_0) = \begin{cases} U_0(SQ, X_0) & \text{if } \int_{C'(SQ, M(s_0, X_0))} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) & \text{if } \int_{C'(SQ, M(s_0, X_0))} dG(T) < \frac{1}{2} \end{cases}$$

---

[15]The information provided to voters by $K > 0$ in the previous game types is superfluous in this game type.

The setter of type X_0 can send one of two messages in the LI game, $M' \in \{(0, X_0), (1, X_0)\}$. The setter's chooses s_0 to maximize $\Phi'_0(s_0, M(s_0, X_0)|X_0)$, where

$$\Phi'_0((0, s_{02}), (0, X_0)|X_0) = U_0(SQ, X_0).$$

$$\Phi'_0((1, s_{02}), (1, X_0)|X_0) = \begin{cases} U_0(SQ, X_0) & \text{if } \int_{C'(SQ,1,X_0)} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) & \text{if } \int_{C'(SQ,1,X_0)} dG(T) < \frac{1}{2} \end{cases}$$

Note first, that the value of $\Phi'_0((0, s_{02}), (0, X_0)|X_0)$ is not affected by the setter's choice of $s_{02}(X_0)$. If $M(s_0, X_0) = (1, X_0)$, then $\Phi_0((1, X_0)|X_0)$ is maximized by $s_{02}(X_0) = X_0$, as was shown in case 1 of this proof (the only difference between this objective function and that objective function is a constant). Thus, $s_{02}(X_0) = X_0$ is a weakly dominant location strategy for the LI game and $s_{02}(X_0) = X_0$ is a dominant partial strategy for all II games.

QED.

One implication of Lemma 2 is that when voters cannot learn the exact location of X_0, the setter can exact rents from her superior information. That is, *in a case where the setter's preference over outcomes is in conflict with the preferences of any decisive set of voters, the setter can ignore voter preferences when choosing $s_{02}(X_0)$. Only when voters have enough information to reward or punish the setter for her choice of $s_{02}(X_0)$ might we begin to observe any convergence of $s_{02}(X_0)$ to the median voter's ideal point.* For notational convenience in describing equilibria, we will, henceforth, refer to the cumulative distribution function of alternatives as $F(X_0)$, and the corresponding density function as $f(X_0)$.

From Lemmas 1 and 2, we can now say that when $K = 0$, the setter should always enter.

Corollary 1 *When the cost of contesting the election is zero, it is a weakly dominant strategy for the setter to contest the election.*

$$\text{If } K = 0 \implies s_{01}(X_0) = 1.$$

Proof:

$\forall X_0 \in \chi_0$:

$$U_0(X_0, X_0) \geq U_0(SQ, X_0).$$

If $K = 0$, this implies that $\Phi_0(1, M_2(s_{02}(X_0))|X_0) \geq \Phi_0(0, M_2(s_{02}(X_0))|X_0)$. (That is, when there is no cost to proposing an alternative, the setter cannot be any worse off by proposing one. In the extreme case, she chooses $s_{02}(X_0) = SQ$.)

QED.

We now establish an undominated (*ex ante* utility maximizing) strategy for voters in the II games.[16] From the common knowledge, voters know the location of SQ and the value of $U_i(SQ, T_i)$. Voters do not know the location of the alternative, but they do know that the setter's dominant strategy, if she enters, is to choose $s_{02}(X_0) = X_0$. Voters may also have opportunities to learn about the location of X_0 through their observation of $M(s_0, X_0)$. Let $A \in \chi_0$ be the voter's (updated) beliefs concerning X_0.

Definition: [17] *For any $A \subseteq \chi_0$ and $h \in \Re$, we call h a decisive point if:*

$$\int_0^1 U_i(X_0, h)dF(X_0|A) = U_i(SQ, h).$$

[FIGURE 1 HERE]

---

[16]In all but the NI game there will be subsets of voters who will be able to maximize *ex post* expected utility. How the actions of these voters affect the equilibria will be detailed in the appropriate sections.

[17]The decisive point *(See Figure 1)* is equivalent to the "cutpoint" found in Morton (1988) and Alesina and Rosenthal (1989).

If a decisive point is unique, then we can use it to characterize the equilibrium strategies of all uncertain voters. The uniqueness of h is established with Lemma 3. The characterization of equilibrium voter strategies made possible by the uniqueness of h is given as Lemma 4.

Lemma 3 *If $\ell = 2$ (quadratic utility functions), then $\forall F$, any decisive point is unique.*

Proof:

$$\text{Let } H(T_i) = U_i(T_i, SQ) - \int_0^1 U_i(X_0, T_i)dF(X_0|A),$$

To prove uniqueness of the decisive point we must establish that there exists one and only one possible voter type (ideal point) for which $H(T_i) = 0$.

$$
\begin{aligned}
\text{Let } H(T_i) &= U_i(T_i, SQ) - \int_0^1 U_i(X_0, T_i)dF(X_0|A) \\
&= -|(SQ - T_i)^2| + \int_0^1 |(X_0 - T_i)^2| f(X_0|A)dX_0 \\
&= -(SQ - T_i)^2 + \int_0^1 (X_0 - T_i)^2 f(X_0|A)dX_0 \\
H'(T_i) &= 2(SQ - T_i) - 2\int_0^1 (X_0 - T_i)f(X_0|A)dX_0 \\
&= 2SQ - 2T_i - 2\int_0^1 X_0 f(X_0|A)dX_0 + 2T_i \int_0^1 f(X_0|A)dX_0 \\
&= 2SQ - 2T_i - 2\int_0^1 X_0 f(X_0|A)dX_0 + 2T_i \\
&= 2SQ - 2T_i - 2\overline{X_0} + 2T_i \\
&= 2SQ - 2\overline{X_0},
\end{aligned}
$$

where $\overline{X}$ is the mean of $F(X_0)$. So, for all $T_i \in [0,1]$, SQ and $\overline{X}$ are constants, which implies that $H'(T_i)$ is monotonic, $H(T_i) = 0$ for only one T_i, and h is unique in $[0, 1]$.

QED[18]

---

[18]Intuition suggests that uniqueness holds for a much larger range of utility functions and distribution

Lemma 4 *If a decisive point is unique, then we can characterize the voting behavior of "uncertain" voters by the following rule:* [19]

Decisive Point Voting Rule (DPVR)
If $(SQ - X_0) \times (h - T_i) > 0 \qquad \Longrightarrow v_i(T_i) = 1$
If $(SQ - X_0) \times (h - T_i) \leq 0 \qquad \Longrightarrow v_i(T_i) = -1$

Proof:

If $\int_0^1 U_i(X_0, T_i)dF(X_0|M(s_0, X_0)) > U_i(SQ, T_i)$, then $(SQ - X_0) \times (h - T_i) > 0$, and the voter maximizes the expectation of $\phi_i(s_0, v_1, \ldots, v_N|T_i)$ by choosing $v_i(T_i) = 1$. If $\int_0^1 U_i(X_0, T_i)dF(X_0|M(s_0, X_0)) < U_i(SQ, T_i)$, then $(SQ - X_0) \times (h - T_i)$ and the voter maximizes the expectation of $\phi_i(s_0, v_1, \ldots, v_N|T_i)$ by choosing $v_i(T_i) = -1$, and $v_i(T_i) = -1$ is a weakly dominant strategy. If $\int_0^1 U_i(X_0, T_i)dF(X_0|M(s_0, X_0)) = U_i(SQ, T_i)$, then any mixture of the strategies $v_i(T_i) = 1$ and $v_i(T_i) = -1$, provides the same expected utility as the choice of either strategy, exclusively.

QED. [20]

When there exists a unique $h \in [0, 1]$, then Lemmas 3 and 4 imply that the following characterization of voting behavior holds:

$$\text{Let } Z = \{T_i \in \tau_i : \int_0^1 U_i(X_0, T_i)dF(X_0|A) > U_i(SQ, T_i)\}$$

$$\text{Then } Z = \{T_i : T_i \leq h_A\} \text{ or } Z = \{T_i : T_i \geq h_A\},$$

of setter ideal points, however, proofs for many of these circumstances are substantially rather unwieldy.

[19] For notational simplicity, we have assigned the voter tie-breaking rule to be $v_i(T_i) = -1$. When the voter is indifferent between the lottery and SQ, any mixture of available voter strategies provides the same expected value. None of the results of the paper are conditional on this assumption.

[20] None of the results are dependent on the particular tie-breaking rule used. I have included this particular rule in DPVR for its notational simplicity and its consistency with the notion that the setter loses ties (i.e., SQ wins ties), a feature of most direct democracy systems.

where Z is the set of voters that prefer the lottery, $\int_0^1 U_i(X_0, T_i)dF(X_0|A)$, to SQ. From the definition of Z and $o(s_{02}(X_0), v_N)$, we know that if $\int_Z g(T)dT > \frac{1}{2}$, then $s_{02}(X_0)$ wins the election, otherwise SQ wins. We will employ Z, or its equivalent for each game type, to characterize equilibrium voter behavior.

2.3.3 How Voters Make "Mistakes."

What does the fact that voters maximize *ex ante* expected utility imply about *ex post* utility and the direct democracy outcome ? *Notice that the "full information minority-preferred alternative" is the direct democracy outcome if and only if a set of decisive voters makes a "mistaken" inference about the spatial relation of T_i, X_0 and SQ.* A voter makes a "mistaken" inference when:

$$\int_0^1 U_i(X_0, T_i)dF(X_0|M(s_0, X_0)) > U_i(SQ, T_i) > U_i(X_0, T_i).$$

That is, the *expected* utility of the setter's proposal is greater than the *known* utility from the SQ, while, in fact, the *known* utility from the SQ is greater than the *actual* utility a voter will receive from the true alternative, X_0. Until voters are fully informed, they can make this type of mistake with positive probability and the full-information *minority* preferred alternative can be the direct democracy outcome. When comparing the equilibria of the different game types in Section 5, our description of the set of "mistaken" voters will allow us to characterize the relationship between the "will of the majority" and the direct democracy outcome.

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2.4 Identifying the Effect of Information on Direct Democracy.

I now use different versions of this model to examine the effect of different types of political information on voting behavior, the setter's strategy and outcomes. Each successive game is a variation of the direct democracy model that allows voters to form a strategy after possessing different information than they did in the previous game. For each game type, I propose electoral equilibria and characterize player strategies and policy outcomes.

2.4.1 The "No Information Transmitted" Game.

In the NI game, $K = 0$, voters do not observe the setter's choice of $s_{02}(X_0)$ and there is no endorsement. From Lemma 1, Corollary 1 and Lemma 2, we know that the setter should choose $s_0(X_0) = (1, X_0)$ in equilibrium. So, $\forall s_0(X_0) : M(s_0, X_0) = (1, 0)$, which implies that $f(x_0|M(s_0, X_0)) = f(X_0)$. That is, since all setters choose the same strategy and voters do not observe $s_{02}(X_0)$, voters obtain no additional information about the setter's strategy during the game and, therefore, must condition their strategy exclusively on their prior beliefs. Equilibrium voting behavior can be characterized by the DPVR (Lemma 4).

Proposition NI:

The equilibrium of the NI game is:

$$\forall X_0 \in \chi_0 : \quad s_0(X_0) = (1, X_0)$$

$$\forall T_i \in \tau_i : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } \int_0^1 [U_i(X_0, T_i) f(X_0|M(s_0, X_0))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

Beliefs can be characterized by $f(X_0|M(s_0, X_0)) = f(X_0)$.

Proof:

The setter's equilibrium entry strategy is proven by Lemma 1 and Corollary 1. The setter's location strategy is proven by Lemma 2.

QED.

Proposition NI holds for all utility functions. For quadratic utility functions the voters' equilibrium strategies can be characterized by Lemma 3 and Lemma 4.

In the NI game, setter strategies are completely pooling (i.e. voters cannot distinguish among setter types through their knowledge of the setter's strategy). Recall that

$$Z = \{T_i \in \tau_i : \int_0^1 U_i(X_0, T_i) dF(X_0 | M(s_0, X_0)) > U_i(SQ, T_i)\}.$$

The NI outcome is $s_{02}(X_0)$ if $\int_Z g(T)dT > \frac{1}{2}$ and is SQ, otherwise. Thus, the NI outcome is determined by which of SQ and $\int_0^1 U_i(X_0, T_i)f(X_0)$ provides the median voter with the highest utility. Because the NI outcome *is not dependent* on $s_0(X_0)$, single peaked utility functions imply that the farther away SQ is from the median voter's ideal point, the more likely it is to lose, regardless of the setter's actual type. The NI equilibrium outcome also implies that the setter derives benefits from her superior information (about the location of $s_{02}(X_0)$), over, above and independent of the benefits that are derived from agenda control and that "rational" voters can cast "*ex post* mistaken" votes (see Section 4.3) in equilibrium. In fact, of all the game types we present, the *full information majority preferred alternative is least likely to be the outcome in the NI game type*. A more detailed analysis of the relevance of these results is reserved for the next section (i.e., after equilibria have been found for each game type).

2.4.2 The "Costly Entry" Game.

In the CE game, $K > 0$, voters do not observe $s_{02}(X_0)$, and there is no endorsement. The setter must decide whether or not to contest the election. The fact that the setter decides to enter sends a signal to the voters. The content of this signal is that the setter believes that she can at least recover the cost of contesting the election. For $K > 0$, the act of contesting the election, and the voter's knowledge of the setter's single-peaked utility function, imply that $s_{02}(X_0)$ is not within a well specified neighborhood of SQ, since policy outcomes near SQ will not provide enough extra utility, for a setter, to make contesting the election a profitable endeavor. The fact that the voters know the value of K and can observe $s_{01}(X_0)$ allows voters to update their prior beliefs based on which of the two messages, $M(s_0, X_0) \in \{(0,0),(1,0)\}$, they receive in the CE game. This updating lowers the probability that a voter casts a "mistaken" vote and increases the probability that the majority's full information preferred alternative is the direct democracy outcome.

Let $\epsilon(K)$ (henceforth referred to as ϵ) be a distance on the continuum which is an increasing function of K, the cost of contesting the election.[21] ϵ determines the size of a range (symmetric around SQ) of alternatives within which it will never be profitable for the setter to contest an election.

$$\epsilon = \text{dist}(SQ, X_0) \text{ such that } U_0(SQ, X_0) = U_0(X_0, X_0) - K.$$

Since K and the shape of the setter's utility function is known, the correspondence between K and ϵ is common knowledge, and so is the distance from SQ within which it is impossible for the setter to recover the cost of contesting the election. This "range of unprofitable alternatives" $[SQ - \epsilon, SQ + \epsilon]$ has length $2 \times \epsilon$. A sample "range" is displayed in Figure 2.

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[21]If the setter is risk averse then both $\frac{d\epsilon}{dK}$ and $\frac{d^2\epsilon}{dK^2}$ are positive. If the setter is risk neutral, the first derivative is positive while the second derivative equals zero.

[FIGURE 2 HERE]

Lemma 5 *If the setter's ideal point is located in the range of unprofitable alternatives, the setter should not contest the election. That is,*

$$X_0 \in [SQ - \epsilon, SQ + \epsilon] \implies s_{01}(X_0) = 0.$$

Proof:

If $K > 0$, then $\forall X_0 \in [SQ - \epsilon, SQ + \epsilon]$ it is the case that $\forall X \in [0, 1]$:

$$U_0(X, X_0) - K < U_0(SQ, X_0).$$

This implies that $\forall X_0 \in [SQ - \epsilon, SQ + \epsilon], \forall s_{02} \in S_0$:

$$\Phi_0((0, X_0), (0, M_2(s_{02}(X_0)))|X_0) > \Phi_0((1, X_0), (1, M_2(s_{02}(X_0)))|X_0).$$

Therefore, $\forall X_0 \in [SQ - \epsilon, SQ + \epsilon] : s_{01}(X_0) = 0$ is a dominant strategy. Therefore, $\forall X_0 \in [SQ - \epsilon, SQ + \epsilon] : s_{01}(X_0) = 0$ is an undominated strategy.

QED

Thus, for setters whose ideal points are located within the range $[SQ - \epsilon, SQ + \epsilon]$, there exist no policies which, given the cost of contesting the election K, will make the setter better off than costlessly accepting SQ. When the cost of contesting an election is sufficiently high, the SQ will go unchallenged and will be the direct democracy outcome. This result and Lemma 1 also imply that the higher the cost of contesting the election, the fewer setter types who will find it profitable to contest the election and the better protected SQ will be.[22]

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[22]This result has been produced in a direct democracy type experimental environment by Herzberg and Wilson (1990), Perhaps a differently focused model than this one could provide direct democracy

When $K > 0$ and $s_{01}(X_0) = 1$, voters know that $X_0 \notin [SQ - \epsilon, SQ + \epsilon]$ and that the distribution $F(X_0)$ has no support over this range.[23] This updating leads to a revised distribution of setter types $F(X_0|(1,0))$, which is related to $F(X_0)$ in the following way (and displayed in Figure 3):

$$f(X_0|(1,0)) = 0 \qquad\qquad\qquad [SQ - \epsilon, SQ + \epsilon] \in X$$

$$f(X_0|(1,0)) = f(X_0) \times \tfrac{1}{1-F(SQ+\epsilon)+F(SQ-\epsilon)} \quad [0, SQ - \epsilon), (SQ + \epsilon, 1] \in X$$

When voters observe no entry, they know that the SQ will be the outcome with certainty. Let $Q(SQ)$ be the distribution of SQ's. It is common knowledge that this distribution always has all of its mass at one point, SQ, therefore: $f(X_0|(0, M_2(s_{02}(X_0)))) = Q(SQ)$.

[FIGURE 3 HERE]

The cost of contesting the election K, determines the "range of unprofitable alternatives" $[SQ - \epsilon, SQ + \epsilon]$. The size and location of this range will determine the number of voters that are members of one of two mutually exclusive and collectively exhaustive subsets of the electorate. The members of one of the subsets are called *centrist voters* $\{i|T_i \in [SQ - \frac{\epsilon}{2}, SQ + \frac{\epsilon}{2}]\}$. The members of the other subset are called *non-centrist voters* if$\{i|T_i \notin [SQ - \frac{\epsilon}{2}, SQ + \frac{\epsilon}{2}]\}$. Because the setter knows $G(T_i)$, for n large, she also knows

participants with the opportunity to take actions that alter the underlying institution and raise or lower the cost of contesting SQ. This would provide another way for participants to protect, or destabilize, a SQ.

[23]Voters use Bayes' Rule to update their beliefs about the location of X_0.

$$p(X_0 = x \in [0, 1]|s_{01}(X_0) = 1) =$$

$$\frac{p(s_{01}(X_0) = 1|X_0 = x \in [0, 1]) \times p(X_0 = x \in [0, 1])}{[p(s_{01}(X_0) = 1|X_0 = x \in [0, 1]) \times p(X_0 = x \in [0,1])] + [p(s_{01}(X_0) = 0|X_0 = x \in [0, 1]) \times p(X_0 = x \in [0, 1])]}.$$

the exact number of voters in each subset.

Lemma 6 *"Vote for the SQ" ($v_i(T_i, M(s_0, X_0)) = $ -1) is a dominant strategy for all centrist voters.*

Proof: When $s_{01}(X_0) = 1[\Longrightarrow M(s_0, X_0) = (1, 0)]$ then Lemma 1, Lemma 2 and Lemma 5 imply:

$$s_{01}(X_0) \Longrightarrow \forall T_i \in (SQ - \frac{\epsilon}{2}, SQ + \frac{\epsilon}{2}), \ U_i(X_0, T_i) < U_i(SQ, T_i).$$

and voting to keep the policy outcome in the interval $[SQ - \epsilon, SQ + \epsilon]$ is a dominant strategy for centrist voters.[24]

QED.

In the CE equilibrium, $\forall X_0 \notin [SQ - \epsilon, SQ + \epsilon]$, $s_{01}(X_0)$ has the same value. All $X_0 \in [0, SQ - \epsilon), (SQ + \epsilon, 1]$ condition their choice of $s_{01}(X_0)$ on the number of voters in the set Z', where:

$$Z' = \{T_i \in [0, SQ - \frac{\epsilon}{2}), (SQ + \frac{\epsilon}{2}, 1] : \int_0^1 [U_i(X_0, T_i) f(X_0 | (1, 0))] > U_i(SQ, T_i)\}.$$

Proposition CE:

The equilibrium for the CE game is:

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[24]When $s_{01}(X_0) = 0[\Longrightarrow M(s_0, X_0) = (0, 0)]$ we assume throughout the paper that $(v_i(T_i, M(s_0, X_0)) = $ -1).

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$$\forall X_0 \in [SQ - \epsilon, SQ + \epsilon] \qquad s_{01}(X_0) = 0$$

$$\forall X_0 \in [0, SQ - \epsilon), (SQ + \epsilon, 1]: \quad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z'} g(T)dT > \frac{1}{2} \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0: \qquad\qquad s_{02}(X_0) = X_0$$

$$\forall T_i \in [0, SQ - \tfrac{\epsilon}{2}), (SQ + \tfrac{\epsilon}{2}, 1]:$$

$$v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } \int_0^1 [U_i(X_0, T_i)f(X_0|(1,0))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

Beliefs can be characterized by $f(X_0|(1,0))$ or $f(X_0|(0,0)) = Q(SQ)$, depending on the value of $s_{01}(X_0)$.

Proof:

The setter's equilibrium entry strategy is proven by Lemma 1 and Lemma 5. The setter's location strategy is proven by Lemma 2.

QED.

Non-centrist voter equilibrium strategies can be characterized by Lemma 3 and Lemma 4. Centrist voter equilibrium strategies can be characterized by Lemma 6.

The CE outcome is $s_{02}(X_0)$ if $\int_{Z'} g(T)dT > \frac{1}{2}$, and is SQ, otherwise. That is, the number of non-centrist voters receiving higher utility from the updated lottery than from SQ must make up a *majority of all voters* in order to make $s_{02}(X_0)$ the CE outcome. As was the case in the NI equilibrium, this outcome is *not dependent* on $s_{02}(X_0)$, which implies that the higher K is the more distant from the median voter's ideal point SQ must be in order to lose the election, regardless of the actual location of the alternative.[25] Thus,

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[25]The only difference between the CE game and the NI game is the value of K. Recall from the NI game, voters could not distinguish among setter types. For a given $F(X_0)$, setters knew the voters' prior

increased costs of contesting the election help to make SQ a more stable direct democracy outcome. The incompleteness of voter information that remains in the CE game helps all setters when SQ is relatively extreme, and hurts all setters when SQ is close to the median voter's ideal point. Notice also that "centrist" voters do not cast mistaken votes in equilibrium and that, all other factors held constant, "non-centrist" CE voters condition their strategies on more accurate prior beliefs than do their NI counterparts. Thus, in equilibrium, this type of information helps voters to cast fewer "mistaken votes" and leads to the *full information majority preferred alternative* becoming the direct democracy outcome more often. A discussion of the relevance of these results is reserved for the next (comparative statics) section.

2.4.3   The Endorsement Game with Costless Entry.

The endorsement, $M_2(s_{02}(X_0)) \in \{-1, 0, 1\}$, represents a costlessly verifiable, truthful opinion expressed by some individual or organization (not the setter)[26] about the relative

beliefs and there were two possible states of the world when it was the voters' turn to vote:

> Either all setter types choose to contest the election or all setter types choose not to
>
> contest the election.

In this game, there are are also two possible states of the world when it is the voters' turn to vote:

> Either all setter types outside of the "range of unprofitable alternatives" choose to contest
>
> the election or all setter types outside of the "range of unprofitable alternatives" choose not
>
> to contest the election. From Lemma 5 we know that setters who have ideal points within
>
> the "range of unprofitable alternatives" will not enter in either case.

---

[26] Another version of this model under development introduces endorsements that the setter can purchase. The act of purchasing an endorsement provides voters with information independent of the value of $M_2(s_{02}(X_0))$. Voters use the purchase information to update their beliefs in a manner similar to the updating process associated with the setter's decision to contest the election.

merits of SQ and $s_{02}(X_0)$. A voter may use the endorsement as a source of information when he believes that the information provider is well informed, and when he believes that he can relate the information provider's preferences to his own. Endorsements are distributed to the electorate by Nature and allow us to characterize the effect that the statements of well-known individuals or opinion leaders[27] have on individual level voting behavior.

In the EN_{ni} game, the choice of $s_0(X_0)$ determines which of three messages, $M(s_0, X_0) = (s_{01}(X_0), M_2(s_{02}(X_0))) \in \{(1,1),(1,0),(1,-1)\}$, will be sent to voters.[28] The content of the signal $M_2(s_{02}(X_0)) = 1$ is that SQ is to the left of $s_{02}(X_0)$, $M_2(s_{02}(X_0)) = -1$ implies that SQ is to the right of $s_{02}(X_0)$ and $M_2(s_{02}(X_0)) = 0$ implies that $SQ = s_{02}(X_0)$. Voters use Bayes Rule to incorporate this information into their beliefs about the location of (X_0). This updating leads to a revised distribution of setter types $F(X_0|(1,-1))$ and $F(X_0|(1,1))$, which are related to $F(X_0)$ in the following manner ($f(X_0|(1,-1))$ is displayed in Figure 4):

If $M(s_0, X_0) = (1,1)$		
$f(X_0|(1,1)) \quad =$	0	$\in [0, SQ)$
$f(X_0|(1,1)) \quad =$	$f(X_0) \times \frac{1}{1-F(SQ)}$	$\in (SQ, 1]$

If $M(s_0, X_0) = (1,-1)$		
$f(X_0|(1,-1)) \quad =$	$f(X_0) \times \frac{1}{F(SQ)}$	$\in [0, SQ)$
$f(X_0|(1,-1)) \quad =$	0	$\in (SQ, 1]$

---

[27]The use of this term in political science is due to Lazarsfeld, Berelson and Gaudet (1944) and Berelson, Lazarsfeld and McPhee in Voting (1954).

[28]Since K=0, from Corollary 1 we know that $s_{01}(X_0) = 1$.

and $F(X_0|(0, \{-1, 1\})) = Q(SQ)$.

[FIGURE 4 HERE]

The endorsement serves to divide the electorate into two mutually exclusive and exhaustive subsets. Let those voters whose ideal points are located in the range where $f(X_0|(1, 1)) = 0$ or $f(X_0|(1, -1)) = 0$ be called *opposite voters* ($\{i|T_i \in [0, SQ), \text{ if } M_2(s_{02}(X_0)) = -1\}, \{i|T_i \in (SQ, 1], \text{ if } M_2(s_{02}(X_0)) = 1\}$). Let all other voters be known as "non-opposite" voters. Opposite voters know that SQ provides them with *ex post* higher utilities than X_0.

Lemma 7 *"Vote for SQ" ($v_i(T_i, M(s_0, X_0)) = -1$) is a dominant strategy for all opposite voters.*

Proof:

If $M_2(s_{02}(X_0)) = 1$, then $\forall T_i \in [0, SQ)$:

$$\int_0^1 U_i(X_0, T_i) f(X_0|(1, -1)) = \int_{SQ}^1 U_i(X_0, T_i) f(X_0) < U_i(SQ, T_i).$$

The argument for $M_2(s_{02}(X_0)) = 1$ is symmetric, with respect to SQ, and follows straightforwardly.

QED.

Proposition EN_{ni}:

The equilibrium for the EN_{ni} game is:

$$\forall X_0 \in \chi_0 : \qquad s_{01}(X_0) = 1$$

$$\forall X_0 \in \chi_0 : \qquad s_{02}(X_0) = X_0$$

$$\forall T_i \in [0, SQ) : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } M_2(s_{02}(X_0)) = -1 \text{ and} \\ & \int_0^1 [U_i(X_0, T_i) f(X_0|(1,-1))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

$$\forall T_i \in (SQ, 1] : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } M_2(s_{02}(X_0)) = 1 \text{ and} \\ & \int_0^1 [U_i(X_0, T_i) f(X_0|(1,1))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

Beliefs can be characterized by $f(X_0|(1,-1))$

or $f(X_0|(1,1))$, depending on the value of $M_2(s_{02}(X_0))$.

Proof:

The setter's equilibrium entry strategy is proven by Lemma 1 and Corollary 1. The

setter's location strategy is proven by Lemma 2.

QED.

The non-opposite voter equilibrium strategies can be characterized by Lemma 3 and

Lemma 4. The opposite voter equilibrium strategies can be characterized by Lemma 7.

Let the set Z_{ni} be defined as follows:

If $M_2(s_{02}(X_0)) = -1$, then

$$Z_{ni} = \{T_i \in [0, SQ) : \int_0^1 [U_i(X_0, T_i) f(X_0|(1, \{-1, 1\}))] > U_i(SQ, T_i)\},$$

If $M_2(s_{02}(X_0)) = 1$; then

$$\{T_i \in (SQ, 1] : \int_0^1 [U_i(X_0, T_i) f(X_0|(1, \{-1, 1\}))] > U_i(SQ, T_i)\}.$$

The EN_{ni} outcome is $s_{02}(X_0)$ if $\int_{Z_{ni}} g(T)dT > \frac{1}{2}$, and is SQ, otherwise. That is, the number of non-opposite voters that receive higher utility from the updated lottery than from SQ must make up a *majority of all voters* in order for $s_{02}(X_0)$ to be the EN_{ni} outcome.[29]

Notice that "opposite" voters do not cast mistaken votes and "non-opposite" voters condition their strategies on more accurate priors than do their NI game counterparts, all other factors held constant. Thus, the presence of endorsements should cause a decrease in the number of mistaken votes cast and an increase in the probability that the *full information majority preferred alternative* is the outcome, relative to the NI game. A more detailed comparison of the equilibria is reserved for Section 5.

2.4.4 Endorsement Game with Costly Entry.

In an EN game with $K > 0$, voters receive two pieces of information, $s_{01}(X_0)$ and $M_2(s_{02}(X_0))$. Voters can use both signals to update their beliefs. For $K > 0$, the act of contesting the election implies that the alternative is not within a well specified neighborhood of SQ, since policy outcomes near SQ will not provide enough extra utility for a setter to make contesting the election a profitable endeavor. The value of the endorsement, $M_2(s_{02}(X_0)) \in \{-1, 0, 1\}$, implies that the alternative is either to the left or right, respectively, of SQ. The introduction of *different types* of information, each of which has a distinct effect, leads to a game where, in general, fewer voter mistakes are made, and the majority's full information preferred alternative is the direct democracy outcome more of the time, than in any of the previously presented game types.

---

[29]The endorsement prevents setters whose ideal points are on the opposite side of SQ as the median voter's ideal point from obtaining an outcome that they prefer to SQ.

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From the CE game, we know that setters whose ideal points are located in the "range of unprofitable alternatives" cannot profit by contesting the election (Lemma 5).

$$X_0 \in [SQ - \epsilon, SQ + \epsilon] \Rightarrow s_{01}(X_0) = 0.$$

Setters whose ideal points are outside of this range use the "Setter Entry Rule" (Lemma 1). Thus, the choice of $s_0(X_0)$ determines which of six messages, $M(s_0, X_0) \in \{(0,1),(0,0),(0,-1),(1,-1),(1,0),(1,1)\}$, will be sent to voters.

Consider the case where non-centrist voters are divided into two groups on opposite sides of the SQ (the case where all non-centrist voters have ideal points on the same side of the SQ follows straightforwardly). Let us refer to these two groups as *left voters* and *right voters*, depending on their relationship to SQ (see Figure 5). Depending on the value of $M_2(s_{02}(X_0))$, either right voters or left voters are "opposite voters."

[FIGURE 5 HERE]

In Figure 6, I consider the case where $M_2(s_{02}(X_0)) = -1$. In this case, right voters are opposite voters and, from Lemma 7, we know that they choose the strategy "vote for SQ." From Lemma 6, we know that centrist voters also "vote for SQ." Left voters know that X_0 is in the range $[0, SQ - \epsilon)$ but not its exact location within that range. The actions of these voters can be characterized by DPVR.

$F(X_0|(\{0,1\}, \{-1,0,1\}))$ is related to $F(X_0)$ in the following manner and displayed in Figure 6:

If $M(s_0, X_0) = (1,1)$		
$f(X_0|(1,1))\ =$	0	$\in [0, SQ + \epsilon)$
$f(X_0|(1,1))\ =$	$f(X_0) \times \frac{1}{1-F(SQ+\epsilon)}$	$\in (SQ + \epsilon, 1]$

If $M(s_0, X_0) = (1,-1)$		
$f(X_0|(1,-1))\ =$	$f(X_0) \times \frac{1}{F(SQ-\epsilon)}$	$\in [0, SQ - \epsilon)$
$f(X_0|(1,-1))\ =$	0	$\in (SQ - \epsilon, 1]$

and $F(X_0|(0, \{-1,0,1\})) = F(X_0|(\{0,1\}, 0)) = Q(SQ)$.

[FIGURE 5 HERE]

The existence of opposite and centrist voters affects the setter's entry decision. Since n is large, the setter knows the exact number of opposite and centrist voters and can condition her strategy on this information. Let the set of voters preferring the updated lottery be Z_{ce}, which is defined as follows:

If $M_2(s_{02}(X_0)) = -1$, then

$$Z_{ce} = \{T_i \in [0, SQ - \frac{\epsilon}{2}) : \int_0^1 [U_i(X_0, T_i)f(X_0|(1,-1))] > U_i(SQ, T_i)\},$$

If $M_2(s_{02}(X_0)) = 1$, then

$$Z_{ce} = \{T_i \in (SQ + \frac{\epsilon}{2}, 1] : \int_0^1 [U_i(X_0, T_i)f(X_0|(1,1))] > U_i(SQ, T_i)\}.$$

Proposition EN_{ce}:

The equilibrium for the EN_{ce} game is:

$$\forall X_0 \in \chi_0: \qquad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z_{ce}} g(T)dt > \frac{1}{2} \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0 \qquad s_{02}(X_0) = X_0$$

$$\forall T_i \in [0, SQ - \epsilon) \qquad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } M_2(s_{02}(X_0)) = -1 \text{ and} \\ & \int_0^1 [U_i(X_0, T_i) f(X_0|(1,1))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

$$\forall T_i \in (SQ + \epsilon, 1] \qquad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } M_2(s_{02}(X_0)) = 1 \text{ and} \\ & \int_0^1 [U_i(X_0, T_i) f(X_0|(1,1))] > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

$$\forall T_i \in (SQ - \epsilon, SQ + \epsilon) \quad v_i(T_i, M(s_0, X_0)) = -1$$

Beliefs are represented by $f(X_0|(1,-1))$, $f(X_0|(1,1))$, or

$$f(X_0|(0,0)) = f(X_0|(1,0)) = f(X_0|(0,-1)) = f(X_0|(0,1)) = Q(SQ),$$

depending on the value of $s_{01}(X_0)$ and $M_2(s_{02}(X_0))$.

Proof:

The setter's equilibrium entry strategy is proven by Lemma 1, and Lemma 5. The setter's location strategy is proven by Lemma 2.

QED.

The non-opposite, non-centrist voter equilibrium strategies can be characterized by Lemma 3 and Lemma 4. The opposite voter equilibrium strategies can be characterized by Lemma 7. The centrist voter strategy can be characterized by Lemma 6. The EN_{ce} outcome is $s_{02}(X_0)$ if $\int_{Z_{ce}} g(T)dT > \frac{1}{2}$, and is SQ, otherwise. In the EN_{ce} equilibrium, not only does the endorsement prevent setters whose ideal points are on the opposite side

of SQ as the median voter's ideal point from obtaining an outcome that they prefer to SQ, but the cost of entry also makes SQ more stable. These facts imply that the SQ will lose the election only if it is relatively extreme (or distant from the median voter's ideal point).

Notice that all opposite voters and all centrist voters vote for SQ. That is, the number of non-opposite, non-centrist voters that receive higher utility from the updated lottery than from SQ must make up a *majority of all voters* in order to render $s_{02}(X_0)$ the CE outcome. Because the range of alternatives eliminated from voter expectations by the observation of $s_{01}(X_0)$ and $M_2(s_{02}(X_0))$, (either $(SQ-\epsilon, 1]$ or $[0, SQ+\epsilon)$) is at least as large as the range eliminated by either type of information alone (either $(SQ-\epsilon, SQ+\epsilon), [0, SQ)$ or $(SQ, 1]$), the probability that voters cast mistaken votes is lower in this game than in any of the other types so far presented. This implies that in the EN_{ce} game, setters whose preferences are contrary to those of a majority of voters should be both less likely to contest the election, and less likely to win the election if she contests. Of all the games presented so far, it is in this game type that the FIMPA is the most likely to be the direct democracy outcome. A more complete discussion of the comparative statics are reserved for Section 5.

2.4.5 The Effect of Learning the Setter's Ideal Point.

In the LI (Learn Ideal Point) game, voters learn the location of the setter's ideal point. The LI equilibrium differs from the previous four in that the additional information causes the direct democracy outcome of the election to always be the *full-information majority preferred alternative*. That voters know X_0 when it is time for them to vote yields a game that is similar to the "One Seller and Sophisticated Buyer" model of Milgrom and Roberts

(1986).

For the LI game, we assume $K = 0$, since the information provided by setter entry is superfluous in the LI game. The setter types will pool in their choice of $s_{02}(X_0) = X_0$, as the conditions required for Lemma 2 to hold (voter ignorance of $s_{02}(X_0)$) do hold. Let $\bar{M} = \{0,1\} \times [0,1]$ be the space of LI game messages. $M_2(s_{02}(X_0)) = X_0$ is the LI endorsement, which reveals the setter's ideal point to voters. Let Z_{li} be the set of voters that prefer the setter's ideal point to SQ.

$$Z_{li} = \{T_i \in [0,1] : [U_i(X_0, T_i) > U_i(SQ, T_i)]\}.$$

We present the equilibrium for this game as Proposition LI (Milgrom and Roberts, Proposition 1.)

Proposition LI:

The equilibrium for the LI game is:

$$\forall X_0 \in \chi_0 : \quad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z_{li}} g(T)dT \geq \frac{1}{2} \\ \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0 : \quad s_{02}(X_0) = X_0$$

$$\forall T_i \in \tau_i : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } U_i(X_0, T_i) > U_i(SQ, T_i) \text{ and } M_1(s_{01}(X_0)) = 1 \\ \\ -1 & \text{if } U_i(X_0, T_i) < U_i(SQ, T_i) \end{cases}$$

Beliefs can be characterized by X_0.

Proof:

The setter's equilibrium entry strategy is proven by Lemma 1. The setter's location strategy is proven by Lemma 2.

QED.

Alternative Proof (due primarily to Milgrom and Roberts (Proposition 1)):

In this game, the median voter does not cast a "mistaken" vote. When voters learn the location of the setter's ideal point, they can do no worse than to assume that $X_0 = X_0$. If the voters do not observe the setter's ideal point, then an undominated strategy for the voters is to assume that X_0 is worse for them than SQ. This "skeptical" strategy induces the setter to reveal any information that he believes will benefit him. This information, in turn, benefits the voters by allowing them to make a more accurate comparison between the two alternatives.

QED.

The LI outcome is $s_{02}(X_0)$ if $\int_{Z_{li}} g(T)dT \geq \frac{1}{2}$, and is SQ, otherwise. The setter obtains her ideal point only if it is closer to the median voter's ideal point than SQ. In this game, voters possess enough information to allow them to pose a credible electoral threat to the setter. That is, if the setter does not reveal her ideal point, the voters vote against her. However, voters do not possess enough information to hold the setter to any implicit agreement that does not involve the setter choosing her own ideal point as $s_{02}(X_0)$. Thus, the setter obtains her ideal point when she enters, but enters the election only when a majority of voters prefer her ideal point to SQ.

2.4.6 The Full Information Game.

In the full information (FI) game, voters learn the location of $s_{02}(X_0)$. This game is essentially equivalent to the Romer and Rosenthal (1978, 1979a) monopoly agenda setter scenario to the extent that all voters know the utility function of the setter. Voters choose the alternative which maximizes their certain utility. The setter chooses an alternative that both she and the median voter (weakly) prefer to SQ. The fact that the setter must

condition her location strategy on voter preferences is unique to this game type. The definition of the endorsement in this game is different than that of previous games. Let $\bar{M} = \{0,1\} \times [0,1]$ be the space of FI game messages. $M_2(s_{02}(X_0)) = s_{02}(X_0)$ is the FI endorsement, which reveals the location of the alternative to voters. Let Z_{fi} be the set of voters that prefer the known alternative to SQ.

$$Z_{fi} = \{T_i \in [0,1] : [U_i(s_{02}(X_0), T_i) > U_i(SQ, T_i)\}.$$

We present the equilibrium for this game as Proposition FI (Romer and Rosenthal).

Proposition FI:

The equilibrium for the FI game is:

$$\forall X_0 \in \chi_0 : \quad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z_{fi}} g(T)dT > \frac{1}{2} \\ \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0 : \quad s_{02}(X_0) = \max_{s_{02}(X_0) \in [0,1]} U_0(\cdot),$$

such that $U_{MV}(T_{MV}, X_0) > U_{MV}(T_{MV}, SQ).$

$$\forall T_i \in \tau_i : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } U_i(s_{02}(X_0), T_i) > U_i(SQ, T_i) \\ & \text{and } M_1(s_{01}(X_0)) = 1 \\ -1 & \text{if } U_i(s_{02}(X_0), T_i) < U_i(SQ, T_i) \end{cases}$$

Beliefs can be characterized by $s_{02}(X_0)$.

Proof: (Interpretation of Romer and Rosenthal (1978), Proposition 1)

Voter actions follow from the Proof of Proposition LI. The shape of the setter's utility function implies that choosing $s_{02}(X_0)$ such that $U_0(s_{02}(X_0), X_0) > U_0(SQ, X_0)$ dominates alternative choices of $s_{02}(X_0)$. If the setter proposes an alternative that the median voter does not prefer to SQ, SQ will win the election. If the setter proposes an alternative that the median voter prefers to SQ, the alternative will win the election. Therefore choosing

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$s_{02}(X_0)$ such that $U_0(s_{02}(X_0) > U_0(SQ, X_0)$ $U_{MV}(s_{02}(X_0), T_{MV} > U_{MV}(SQ, T_{MV})$ dominates alternative strategies. Within the class of strategies that both the median voter and the setter prefer to SQ, choosing $s_{02}(X_0)$ is a best response for the setter.

QED

The setter should choose $s_{02}(X_0)$ to maximize her own utility while being preferred by the median voter to SQ. Note that $u_{MV}(\cdot)$ is estimated by the setter using $G(T_i)$. The result of full information is that the implicit contract between the setter and voters now becomes enforceable. Setters can still obtain their ideal point, but only when the median voter explicitly allows it.[30]

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[30]Consider three types of cases. From right to left on the continuum are: (X_{MV}^* is the median voter's ideal point)

Case 1: X_{MV}^* SQ X_0

Case 2: X_{MV}^* X_0 SQ

Case 3:   SQ X_{MV}^* X_0

In games with uncertain voters, the setter was free to place X_0 wherever she pleased, but always chose $s_{02}(X_0) = X_0$ since the voters could not identify the true location of X_0 and reward her for it. In Case 1, the setter's equilibrium strategy should be to not contest the election. In Case 2, the setter's equilibrium strategy should be to contest the election and choose $X_0 = X_0$.

To show the difference between this game and those that preceded it, suppose that $U_{MV}(T_{MV}, SQ) > U_{MV}(T_{MV}, X_0)$, but $\exists X_0'$ such that $U_{MV}(X_0') > U_{MV}(T_{MV}, SQ)$ and $U_j(X_0, X_0') > U_j(X_0, SQ)$. That is, there exists some alternative in the interval $[SQ, X_0]$, that simultaneously makes both the setter and median voter better off. In games with uncertain voters, this seemingly reasonable outcome cannot be achieved because voters would not be able to verify $s_{02}(X_0) = X_0'$ and the setter would have no incentive to choose this point. In game 6, the setter knows that the voters can find out the location of X_0 and is now forced to consider the preferences of the voters.

2.5 Comparative Statics and the Effect of Information.

In this section, we compare the equilibria of the six game types in order to emphasize important characteristics of the way in which politically-generated information affects player strategies, policy outcomes, and the relationship between the direct democracy outcome and the (FIMPA) *Full Information Majority Preferred Alternative*. Recall that the FIMPA refers to the full information preference of a majority of voters between SQ and $s_{02}(X_0)$. While there are a great many comparisons that could be discussed, we will focus our attention on four of the most descriptive comparisons. First, we will analyze the effect of the voters' observation of the setter's entry decision on direct democracy strategies and outcomes. Second, we will carry out the same type of analysis for the effect of endorsements. Third, we will examine how the direct democracy model is affected when the voters learn the setter's type. Finally, we will separate the effects of agenda control and incomplete information in order to show how each individually, and both together, affect direct democracy strategies and outcomes.

We first consider *the effect that the voters' observation of the agenda setter's entry decision has on direct democracy strategies*. To examine the effect of this type of information, we first compare the equilibria of the NI and CE games. Note that the only difference between these two game types is the existence of a positive cost of entry in the CE game. When $K = 0$, the observation of setter entry, $s_{01}(X_0) = 1$, provides no additional information to voters about the setter's type. The same observation when $K > 0$ allows voters to eliminate, from their beliefs, a range in which $s_{02}(X_0)$ cannot be, $[SQ - \epsilon, SQ + \epsilon]$. When the cost of entry is greater than zero, the fact that the setter has chosen to contest the election signals to voters that the setter believes she can recover the cost of contesting the election. This also implies that the setter prefers policy outcomes that are not within a

certain distance of SQ, since policy outcomes near SQ will not allow the setter to recover the cost of contesting the election. This additional information allows centrist voters to maximize *ex post* expected utility and assures that these voters will not cast mistaken votes in equilibrium. Non-centrist voters condition their strategies on a smaller set of contingent states when $K > 0$. Since the compliment of the smaller set of contingent states is a set of setter types that will not be realized in equilibrium, non-centrist voters are less likely to cast "mistaken votes" when $K > 0$ (in the CE game), than when $K = 0$ (in the NI game).

Thus, in Direct Democracy, voters can use their perception of the agenda setter's effort to infer the magnitude of the benefit that the setter expects to receive from the implementation of $s_{02}(X_0)$. This inference allows a voter to make a better estimate of the setter's preferences, preferences that the voter can then compare to his own in order to make inferences about the difference in utility offered by SQ and $s_{02}(X_0)$. When voters cast fewer mistaken votes, only setters whose policies would be more likely to win (obtain a majority of votes) under conditions of full information should be more likely to contest and/or win an election. Setters whose victories are the result of voter "mistakes" are less likely to win when voter mistakes decrease. Thus, when this type of information is introduced, (that is, when the electorate knows more about the alternatives due to knowledge of the setter's costs (effort)) the FIMPA is more likely to be the direct democracy outcome. In addition, the introduction of costly entry increases the probability that SQ is the direct democracy outcome by narrowing the set of setter types that will challenge it.

Let us now consider how *endorsements affect direct democracy outcomes*. In comparison to the NI game, the FIMPA is the more likely outcome of the EN_{ni} game, as a result of an expected decrease in the number of mistaken votes cast. To see this, note that

"opposite voters" do not cast mistaken votes in the EN_{ni} equilibrium. They always vote for SQ, and it always provides them with a higher payoff than $s_{02}(X_0)$, a fact known to opposite voters as a result of the endorsement. "Non-opposite voters" are also less likely to cast mistaken votes than their NI game counterparts since EN_{ni} voters condition their strategies on a smaller range of possible alternative locations in the EN_{ni} game than in the NI game. The difference in the ranges represents alternative locations that EN_{ni} voters know can occur with zero probability. NI voters do not have this information. Thus, in general, voters cast fewer "mistaken votes" and the probability that FIMPA is the direct democracy outcome should increase. That is, the presence of the endorsement (an increase in voter information), leads to outcomes that are more favorable for a majority of voters and less favorable to agenda setter types that prefer different outcomes than a decisive set of voters.[31]

In the EN_{ce} game, voters receive the information from their observation of costly setter entry and an endorsement. The range of alternatives eliminated from voter prior beliefs as a result of their observation of costly entry and the endorsement (either $(SQ - \epsilon, 1]$ or $[0, SQ + \epsilon))$ is at least as large as the range eliminated by either type of information alone (either $(SQ - \epsilon, SQ + \epsilon), [0, SQ)$ or $(SQ, 1]$). Thus, using the same reasoning as above, the probability that voters cast mistaken votes is lower in this game than in any of the other game types so far presented. Fewer mistaken votes lead to an increased probability that the FIMPA is the direct democracy outcome.

This relationship suggests that the voters' access to simple and publicly available sources of information, like the cost of contesting an election and endorsements, can be very informative to direct democracy voters. If obtaining these forms of information re-

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[31]How this outcome compares to the CE game depends entirely on the value of K and the range eliminated by the value of m.

quires less effort than obtaining information about the true location of an alternative, then comparative statics suggest that there exist circumstances where voters can cast a "correct" vote while possessing very little information.[32] This suggests that where both types of information are available, the ability to answer survey questions about the issues is not a necessary condition for casting a correct vote.

When voters can learn the setter's preferences, as is the case in the LI game type, they possess enough information so that "mistaken" votes are never cast in equilibrium. LI voters possess enough information to allow them to pose a credible electoral threat to the setter. That is, if the setter does not reveal her ideal point, the voters vote against her. However, voters do not possess enough information to hold the setter to any implicit agreement that does not involve the setter choosing her own ideal point as $s_{02}(X_0)$. Thus, the setter obtains her ideal point when she enters, but enters the election only when a majority of voters prefer her ideal point to SQ. This implies that the FIMPA is always the direct democracy outcome.

A comparison of the equilibrium outcome of the LI game with that of previous games allows us to see not only the effect of political information on voter strategies, setter strategies, and outcomes, but also allows us to gain some insight into the value of information. It is clear that a voter's ability to obtain preferred outcomes is increasing in the quality and quantity of political information he possesses relative to the setter. It is also clear that a setter's ability to obtain preferred outcomes depends not only upon agenda control, but also upon the existence of information asymmetries between herself and the voters.

We now attempt to separate the effects of agenda control on policy outcomes from the

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[32] From the model, we can conjecture that these circumstances are characterized by the presence of credible endorsements and the ability of voters to observe campaign expenditures, in terms of both human and capital resources.

effect of asymmetric information. We do so by comparing the NI equilibrium outcome, the FI equilibrium outcome [(which is similar to Romer and Rosenthal (1978, 1979a, 1979b)] and the equilibrium outcome of an equivalent full-information, two-candidate election [Black (1958)].

In the full-information, two-candidate equilibrium, both candidates care only about winning and promise to implement the median voter's ideal point, $(o(s_0, v_N) = T_{MV})$. The median voter's ideal point is also the winning outcome if the candidates only care about the location of policy and have ideal points that are on opposite sides of the median voter's ideal point. If both candidates have ideal points that are not separated by the median voter's ideal point, then the candidate whose ideal point is closest to the median voter's ideal point wins the election, by choosing his own ideal point. In the FI game, the setter cares only about the location of the policy outcome and chooses the policy that simultaneously maximizes his utility and is, at least, weakly preferred by the median voter to the SQ

$$o(s_0, v_N) = \{SQ, X' = max_{X' \in [0,1]} U_0(\cdot), \text{ (such that } U_{MV}(X_0, T_{MV}) > U_{MV}(SQ, T_{MV})).\}$$

The FI outcome is either the point chosen by the setter, or the SQ (if there does not exist a point that both the setter and the median voter prefer to the SQ). For all setter types, the difference in utility from the equivalent full-information, two-candidate game (where either candidates care only about winning or candidates care only about policy and have ideal points located on either side of the median voter's ideal point) and the full information direct democracy game is non-negative and equals

$$U_0(\{X_0', SQ\}, X_0) - U_0(T_{MV}, X_0) \geq 0. \tag{2.1}$$

for all Equation 1 shows the gain in utility to the setter of agenda control, alone.

It remains to show the effect of information, alone, on direct democracy. To do this we

compare the FI and NI equilibria. In the NI game, the setter always enters the election (Lemma 1), and chooses $s_{02}(X_0) = X_0$ (Lemma 2). The outcome is either SQ or X_0. For all setter types, the difference in utility from the NI game and the utility from the FI game is always non-negative, and equals:

$$\forall X_0 \in \chi_0 : \quad U_0(\{X_0, SQ\}, X_0) - U_0(\{X_0', SQ\}, X_0) \geq 0. \tag{2.2}$$

Equation 2 represents the gain in utility to the setter of superior information (relative to voters) about the content of the alternative. The difference in equation 1 (benefit from agenda control) plus the difference in equation 2 (benefit from information) equals the total benefit to the setter of agenda control and superior information.

Thus, when voters cannot learn the exact location of $s_{02}(X_0)$, the setter can benefit from both her agenda setting opportunities and her superior (asymmetric) information. By comparing the results of the full information two candidate model, the full information setter model and the "No Information Transmitted" model, we can begin to appreciate the distinct but important effects of agenda control and political information asymmetries. The effect of information on the direct democracy outcome and the utility of the setter and median voter are substantial. This effect suggests that the amount of information available to voters is an important determinant of whether or not the direct democracy outcome is the FIMPA. In fact, it suggests that full information majority preferred outcomes depend on the enforceability of the implicit contract between the setter and voters.

In a full information environment, we expect an implicit agreement to take place between the setter and the median voter. The agreement specifies that the setter will choose the alternative to be a point that the median voter prefers to SQ and the median voter votes for it. In the NI game, as in each of the incomplete information direct democracy games presented, the setter can costlessly cheat on any implicit agreement. If the setter

does cheat, she will not be caught until after the median voter votes. In a one period game of incomplete information, the median voter can neither provide the setter with incentives not to cheat nor punish the setter for cheating. Therefore, the setter has no incentive to converge to either the median voter's ideal point or to a point that the median voter prefers to SQ. Only when voters have enough information to reward the setter for her choice of policy should we observe any type of voter-influenced result. This implies that minority interests can prevail when direct democracy is used to decide policy only when the minority has access to agenda control and superior information. *This also implies that direct democracy must be consistent with the "will of the majority" only when voters have enough information to reward setters who propose majority-preferred alternatives.*

Table 3 provides a comparison of the equilibria, player strategies, characteristics of mistaken voters and direct democracy outcomes across the six game types.

Table 3 - Equilibrium Comparison

Type	Setter Entry	Location of $s_{02}(X_0)$	Voter		P(mistake) Ranking	P(FIMPA) Ranking
			Type	Strategy		
NI	Always	X_0	All	DPVR	1	6
CE	SER	X_0	**CENT:** **N-C:**	$v_i = SQ$ DPVR	2	4
EN_{ni}	Always	X_0	**OPP:** **N-O:**	$v_i = SQ$ DPVR	2	4
EN_{ce}	SER	X_0	**OPP,N-C:** **CENT:** **N-O, N-C:**	$v_i = SQ$ $v_i = SQ$ DPVR	4	3
LI	SER	X_0	$v_i = SQ$, unless $U_{MV}(X_0) > U_{MV}(SQ)$		5	2
FI	Always	max U_0: s.t. $U_{MV}(X_0) > U_{MV}(SQ)$	Vote U max.		5	1

SER	Setter Entry Rule
DPVR	Decisive Point Voting Rule
CENT	Centrist Voters
N-C	Non-Centrist Voters
OPP	Opposite Voters
N-O	Non-Opposite Voters
FIMPA	Full Information Majority Preferred Alternative

2.6 Conclusion.

In this chapter we have developed a spatial model that allows us to identify, and obtain a better understanding of, the effect of different types of political information on direct democracy. By varying the information parameters of the model, and through the use of comparative statics, we have established how and under what circumstances the amount, content and source of information affect the outcomes that prevail under direct democracy.

We have shown that the information derived from a voter's observation of the setter's effort or the information derived from endorsements (the statements of others) can influence the strategy choices of both voters and agenda setters. For instance, when voters are uncertain about the exact location of $s_{02}(X_0)$, the setter can benefit from both her agenda setting opportunities and her superior information by selecting her ideal point as an alternative to SQ. Unlike agenda setter models of full information, where we expect an implicit agreement about the location of the alternative to take place between the setter and the median voter in incomplete information agenda setter models, the setter can costlessly cheat on any such implicit agreement. As a result, the setter has no incentive to converge to either the median voter's ideal point or any point that the median voter prefers to SQ. Only when voters have enough information to reward the setter for his choice of policy should we observe any type of voter-influenced result.

We have shown that under certain conditions of incomplete information, voters can cast "mistaken" votes in equilibrium. However, as voters obtain more information, they can form more precise estimates of the relationship between the setter's proposal and their own utility. These updated estimates lower the probability that voters cast "mistaken" votes and increase the probability that the full information majority preferred alternative (FIMPA) is the direct democracy outcome (which increases the expected value of this
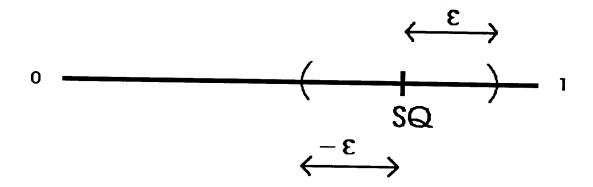
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game to voters).

These findings can be given a different, but useful, interpretation. Voters do not require full information to vote in their own full information best interests. By lowering the probability that a mistake is made, we also increase the probability that a voter will vote in his own best interests with less than complete information. This result is similar to that of McKelvey and Ordeshook's (1984, 1985b, 1986b) incomplete information two-candidate spatial model. In their analysis, voters used verifiable endorsements and assumptions about other voters' beliefs as substitutes for full information. In contrast, voters here employ their prior beliefs about the setter's type, and cue off the setter's actions to infer her preferences. Viewed separately, or together, the findings of these models indicate that voters do not require full information to vote in their own best interests. In both models, then, voters may require so little information that, while voting correctly and using information efficiently, they may not be able to answer even simple survey questions about the issues.[33]
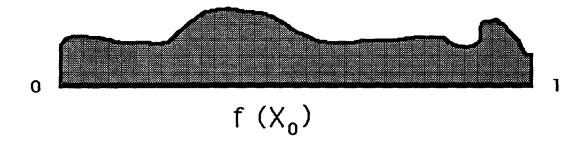
As a result of the effects of information on voting behavior and agenda setter strategies we can see that the more informed voters are, then the more likely is the direct democracy outcome the full information preferred alternative. This relationship implies that political information and direct democracy outcomes are inextricably bound. Since the types of information that are introduced in the model and that affect direct democracy, are highly generalizable, this model can help us to better understand and evaluate direct democracy as a policy making institution.

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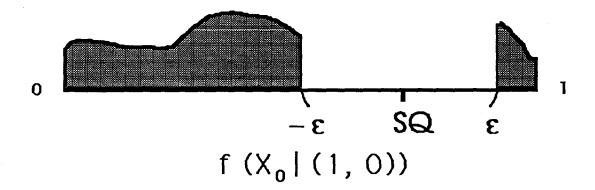
[33]Empirical verification of this statement is provided in Chapter 4.

2.7 Figures for Chapter 2.

FIGURE 1

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FIGURE 2

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$$f(X_0)$$

$$f(X_0 | (1, 0))$$

$-\varepsilon$ SQ ε

$-\varepsilon/2$ $\varepsilon/2$

Use DPVR $v_i = -1$ DPVR

FIGURE 3

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$$f\ (x_0)$$

$$f\ (X_0\,|(1,\ -1))$$

Use DPVR $\qquad$ $v_i = -1$

FIGURE 4

FIGURE 5

$f\,(X_0)$

$-\varepsilon$ SQ ε

$f\,(X_0|\,(1,\,-1))$

Use DPVR $-\varepsilon/2$ $v_i = -1$

FIGURE 6
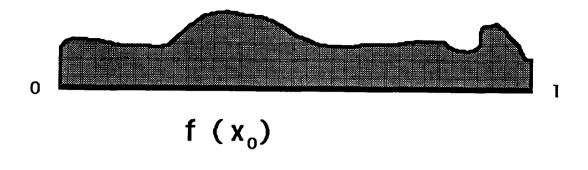
Bibliography

[1] Alesina, Alberto and Howard Rosenthal (1989). "Partisan Cycles in Congressional Elections and the Macroeconomy" *American Political Science Review*, 83, 373 - 398.

[2] Berelson, Bernard R., Paul F. Lazarsfeld and William N. McPhee (1954). *Voting: A Study of Opinion Formation in a Presidential Campaign*. Chicago: University of Chicago Press.
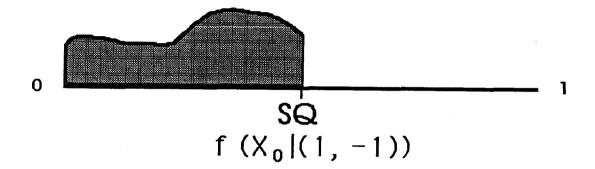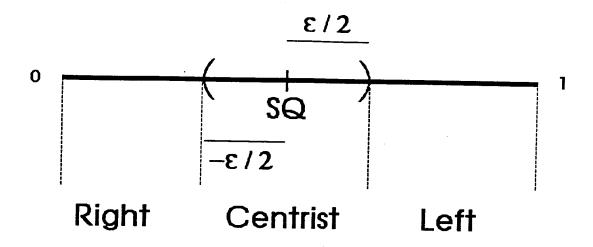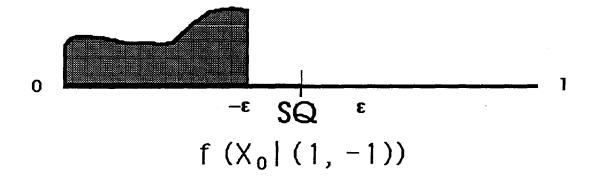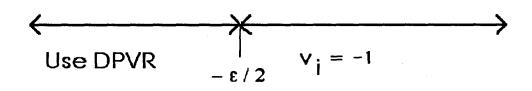
[3] Black, Duncan (1958). *Theory of Committees and Elections*. Cambridge: Cambridge University Press.

[4] Butler, David and Austin Ranney (1978). *Referendums: A Comparative Study of Practice and Theory*. Washington: American Enterprise Institute.

[5] Downs, Anthony (1957). *An Economic Theory of Democracy*. New York: Harper and Row.

[6] Herzberg, Roberta and Rick Wilson (1990). "Voting as a Public Bad: Theoretical and Experimental Results on Voting Costs" Mimeo, presented at the Western Political Science Association Meetings, March 1990.

[7] Jacobson, Gary C. (1983). *The Politics of Congressional Elections*. Boston: Little and Brown.

[8] Kreps, David M. and Robert Wilson (1982). "Sequential Equilibria" *Econometrica*, 50 , 863 - 894.

[9] Lazarsfeld, Paul F., Bernard R. Berelson and Hazel Gaudet (1944). *The People's Choice*. New York: Duell, Sloan and Pearce.

[10] McKelvey, Richard D. and Peter C. Ordeshook (1984). "Rational Expectations in Elections: Some Experimental Results Based on a Multidimensional Model" *Public Choice*, 44, 61 - 102.

[11] McKelvey, Richard D. and Peter C. Ordeshook (1985a). "Sequential Elections with Limited Information" *American Journal of Political Science*, 29, 480 - 512.

[12] McKelvey, Richard D. and Peter C. Ordeshook (1985b). "Elections with Limited Information: A Fulfilled Expectations Model Using Contemporaneous Poll and Endorsement Data as Information Sources" *Journal of Economic Theory*, 36, 55 - 85.

[13] McKelvey, Richard D. and Peter C. Ordeshook (1986). "Information, Electoral Equilibria and the Democratic Ideal" *The Journal of Politics*, 48, 909 - 937.

[14] Milgrom, Paul and John Roberts (1986) "Relying on the Information of Interested Parties" *Rand Journal of Economics*, 17, 18 - 32.

[15] Morton, Sanford (1988). "Strategic Voting in Repeated Referenda" *Social Choice and Welfare*, 5, 45 - 68.

[16] Olson, Mancur (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.

[17] Popkin, Samuel, John W. Gorman, Charles Phillips, and Jeffrey A. Smith (1976). "Comment: What Have You Done for Me Lately? Toward An Investment Theory of Voting" *American Political Science Review*, 70, 779 - 805.

[18] Romer, Thomas and Howard Rosenthal (1978). "Political Resource Allocation, Controlled Agendas, and the Status Quo" *Public Choice*, Volume 33, 27 - 44.

[19] Romer, Thomas and Howard Rosenthal (1979a). "The Elusive Median Voter" *Journal of Public Economics*, Volume 7, 143 - 170.

[20] Romer, Thomas and Howard Rosenthal (1979b). "Bureaucrats vs. Voters: on the Political Economy of Resource Allocation by Direct Democracy" *Quarterly Journal of Economics*,93, 563 - 587.

Chapter 3

Voter Information, Endorsements and Electoral Outcomes: Insurance Reform in California.

3.1 Introduction.

"...the political genius of the citizenry may reside less in how well they can

judge public policy than in how well they judge the people who advise them

how to judge policy"[1]

In this chapter, we examine empirically the effects of political information on California voters who were voting over five different and complex insurance reform initiatives. Our data are taken from a survey instrument designed to elicit not only what voters knew about the issues but also what voters knew about their sources of information. The choice

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[1] From   Bernard   R.   Berelson,   Paul   F.   Lazarsfeld   and   William   N.   McPhee   in Voting: A Study of Opinion Formation in a Presidential Campaign (1954), page 109.

of a survey instrument that focuses on this particular election derives from our desire to understand the role of information in a unique, but important, electoral environment. This electoral environment was characterized by a complex voter decision problem and an unusually intimate relationship between this case study's debated issue (in effect, the allocation of insurance market "surplus"),[2] its electoral contestants (the insurance industry, the state's trial lawyers and consumer activists), it's primary information providers (the insurance industry and trial lawyers, who dominated the paid media), and it's ultimate decision makers (voters, many of whom were also consumers of insurance).

Briefly, we find that: **(1)** the content *and* source of voter information affected voting behavior; **(2)** it was not necessary for voters to possess high levels of information about the issues in order to cast a vote consistent with their interests; and **(3)** the existence of competing and well-known information providers facilitated the use of "inexpensive" voter information. These findings support the theoretical findings about the effects of information on voting behavior of the type found in McKelvey and Ordeshook (1984, 1985a, 1985b, 1986) and in Chapter 2 of this dissertation [Lupia (1990)].

We chose this case study, as opposed to one of the other California initiative battles of

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[2] "Surplus" is a term used by economists that refers to the benefits that market participants receive from market transactions. I use the term to refer to the sum of two specific types of "surplus" – "consumer surplus" and "producer surplus". "Producer surplus", in this case, is the sum, across insurance suppliers, of the difference between what it costs, where "costs" are a function of the potential returns to inputs and not just the price of inputs, to produce a good (like insurance) and the price at which insurance policies are sold in the market. "Consumer surplus" is the sum, across insurance consumers, of the difference between what consumers would be willing to pay for an insurance policy and what they actually have to pay for insurance in the market. Insurance regulation defines some of the rules under which the market operates. Insurance reform suggests different methods of regulation and different methods of regulation determine the allocation of insurance market surplus which is a determinant of the wealth of the insurance market participants.

the late 1980's, for several reasons. First, reform of the state's insurance regulation was (and still is) a highly salient issue. This salience is largely due to the fact that debates over "insurance reform" are, in effect, debates about the allocation of insurance market "surplus." Each of the five initiatives corresponded to significant changes in the insurance regulatory framework that had the potential to affect the price or value of many insurance policies, as well as insurance industry profits and trial lawyer caseloads.

Second, owing to the complexity of each electoral alternative (each ballot initiative was lengthy and technical), we anticipated that most voters would not take the time or effort needed to become informed about the different alternatives and would search for information "short cuts." Consider that in a state as large as California, the probability of casting the decisive vote, even if wildly overestimated, should be perceived by each voter to be very close to zero. This, in itself, provides a voter with little incentive to obtain information. When we consider, as did Downs (1957) and Popkin et al (1979), the "public good" aspects of political information (that is, any information that one voter obtains in order to cast a more informed vote benefits others as well as himself), then the opportunity to "free ride" off the information of other voters should depress an already small incentive to collect information. Given these small incentives, we expect that voters who are interested in obtaining political information do so in the least costly manner possible. We, thus, expect many voters to look for "short cuts," or for sources of relatively low-cost information that are easier to comprehend. The type of message included in most campaign advertising is an example of a "short cut" since the content of the advertisement is selected to provide an easily understandable message.

Third, we expected the electoral contestants to be aware of the voter decision problem, and given the potential effect of different electoral outcomes on their own profitability, we expected high levels of campaign expenditure by the insurance industry and trial lawyers

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(where the expenditure would be directed at the provision of "information short cuts" that were designed to influence voting behavior in particular ways). As Table 1 shows, at least our third expectation was realized.

Table 1 - Expenditures

Insurance Industry	over $ 65 million
Trial Lawyers	over $ 15 million
Consumer Groups	under $ 2 million
TOTAL	$ 82,040,002

We begin our empirical exploration of the relationship between political information, voting behavior and policy outcomes by offering a brief history of the events leading up to the particular election being studied in section 2. We then describe the role of information in the case study in section 3. In section 4, we describe the construction and execution of the survey instrument. Section 5 is a review of the aggregated responses to the survey that allows us to describe what our respondents knew. In sections 6 and 7, we offer explanations for the variations in individual voter decisions as a function of political information and in section 8 we provide a summary of the results.

3.2   Background - The Politics of Insurance Reform.

In 1987, California drivers paid the third highest auto insurance rates in the nation.[3] Through the end of that year, several legislative efforts to alter the insurance regulatory structure had proven unproductive. Both the state's insurance industry and trial

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[3]The average cost of an auto insurance policy in California in 1987 was third highest in the nation behind only New Jersey and Alaska.

lawyers, who receive half of their caseload from automobile accident claims, [4] recognized the widespread public support for regulatory reform and were interested in influencing the reform agenda. Each group publicly blamed the other for the rapid increase in auto insurance premiums. The insurance industry argued that the cause of higher rates was skyrocketing legal costs, and they thereby supported regulatory reform that changed the state's tort laws (by limiting attorney fees or minimizing the likelihood of large settlements). This version of reform assigned most of the costs of reform to (or allocated insurance market "surplus" away from) trial lawyers. In contrast, the California Trial Lawyers Association (CTLA) publicly portrayed the insurance industry as greedy oligopolists who were conspiring against consumers. CTLA supported regulatory reform that relaxed the insurance industry's anti-trust exemption, [5] nullified other competition-restricting laws and assigned the cost of reform to the insurance industry.

Both insurers and attorneys were, at the time, among the largest contributors to political figures in California and both had what were among the most influential lobbies in Sacramento. [6] Although I do not attempt to prove the implied causality, it has repeatedly been the case that bills unfavorable to one of these groups died under predictable circumstances (i.e., specific committees of the California Assembly). [7] Both insurers and

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[4]Reich, Kenneth, "Bid to Qualify Five Insurance Initiatives is in High Gear," *Los Angeles Times*, February 15, 1988, I:3,4.

[5]Under the McCarran act, the insurance industry was exempt from California's anti-trust laws.

[6]Reich, Kenneth, "Insurance Lobby Study Cites Large Gifts to Politicians by Trial Lawyers" *Los Angeles Times*, June 20, 1987, I:3.1. Both Common Cause and Insurance industry estimates are cited in this article.

[7]Insurance supported tort reform bills have died in the Assembly Judiciary Committee, while lawyer supported anti-trust laws have died in either the Assembly Finance and Insurance Committee or the Ways and Means Committee. Republicans, who make up a minority or each committee, tend to support (insurance supported) tort reform measures. In general, Democrats support bills more favorable to the trial lawyers, yet each of these measures usually falls one or two votes short of passage in committee through the defection of two to four Democrats.

trial lawyers either have enough influence or enough coincidentally sympathetic legislative support, to block legislation that is unfavorable to them.

Consumer activist groups, despite having lesser funds for contribution and lobbying purposes, have also been behind the introduction of several insurance reform bills. However, these bills have been closer to the interests of the trial lawyers and, as a result, have been opposed by the insurance industry. These bills have died in the same committees as have the lawyer-supported bills.

When the legislative stalemate seemed destined to outlast calendar year 1987, a variety of consumer groups voiced their intent to place an initiative on the November, 1988, ballot. By submitting an initiative, consumer groups would not only gain control of the reform agenda, but they would also force the other interests to spend millions of dollars to protect the (relatively favorable) status quo. Because both the insurers and the lawyers wished to avoid this expense, both groups attempted to form coalitions amongst themselves, as well as with the consumer activist groups, in order to assure that a costly initiative battle would not occur.

As a result of the consumers' announced intentions, negotiations concerning the nature of insurance reform took place in two arenas. One arena was the legislature, where support for amendments to existing bills was the currency of exchange among the interest groups and their legislative sympathizers. The other arena was private and semi-private meetings held across the state. In September, the insurers agreed not to support an initiative in exchange for lawyer support of light tort reforms. At the end of October, the insurance industry agreed to support a rate regulation bill in exchange for a consumer activist promise not to sponsor an initiative. This second agreement fell apart when two major insurance companies and several consumer groups withdrew their support for the bill

before the Assembly could act on it.[8] This schism assured that the legislature would not pass any reform before the deadline for submitting initiatives.

At that time, the main determinant of whether or not an initiative battle would take place depended on the success in gathering signatures of a consumer activist group called "Access to Justice." The "Access to Justice" initiative was more extreme than those submitted by insurance or trial lawyer interests and assigned most of the "costs of reform" to the insurance industry. The task facing "Access to Justice," and other groups who wished to qualify an initiative, was the collection and submission to the attorney general of 372,178 verified registered voter signatures within 150 days of the submission of a potential ballot initiative.[9] In an action designed to keep others from qualifying their initiatives, the insurance industry and CTLA each hired one of the two firms in California that were in the business of collecting signatures. Both contracts had clauses that excluded these firms from working for any other insurance initiative. These contracts necessitated the organization of a grass roots organization by the consumer activists in order to collect the necessary signatures.[10]

By the end of January, "Access to Justice" had changed its name to "Voter Revolt to Cut Insurance Rates," had garnered the very public support of consumer-advocate Ralph Nader, and had collected enough signatures to qualify its proposition for the ballot.[11] The

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[8] Meeting in special session because of the (October 1, 1987) Whittier earthquake.

[9] This number equals 5 % of the votes cast in the last Gubernatorial election.

[10] During the reform negotiations, all three groups collected signatures in the event that existing agreements broke down or new agreements could not be reached. Both the insurance and trial lawyer organizations collected enough signatures to place a measure on the ballot, even though their agreements, which included promises not to place initiatives on the ballot, were still in effect. The signatures were to be used in the event that one of the other initiative submitters (consumer groups, individual lawyers or insurers acting on their own) qualified a measure for the ballot.

[11] Reich, Kenneth. "Nader Backs 'Voter Revolt' over Insurance, Takes Swipe at Lawyers" *Los Angeles*

qualification of this initiative led to an avalanche of signature submission and initiative qualification that resulted in five different insurance reform initiatives appearing on the ballot. An informal, but theory-based, explanation of why one initiative qualification should have lead to others is included as Appendix A.2.

Each insurance proposition suggested a different reform and each was written and supported in a manner that would make it appear pro-consumer. Three of the five propositions were supported and written by insurance interests. One proposition was supported by, and written in consultation with, the California Trial Lawyers' Association and another was written by Voter Revolt, the consumer activist group supported by Ralph Nader.

Only one of the five propositions passed on Election Day. Proposition 103, sponsored by Voter Revolt, received 51.1 percent of the vote. The outcome of this election was determined by the following electoral rule:

On each of the five propositions voters could vote either "yes" or "no" (i.e., a voter could vote "yes" on all of the proposals). The only propositions that could change the existing law were those that received greater than 50 percent of the vote. Where "winning" propositions contradicted each other, the proposition with the highest vote share prevailed.[12]

Times, January 30, 1988, I:29,1.

[12]The presence of multiple and closely related initiatives should lead us to consider the role that "strategic voting" could play. A voter casts a "strategic vote" when she votes against a candidate or measure she prefers in order to obtain a preferred outcome. For strategic voting to be effective, it must be the case that strategic voters have very detailed information about the preferences and actions of other voters. It should also be the case that strategic voting will affect the outcome. There are a number of reasons that I do not believe strategic voting to be an important element of this case study. Statewide polls released in the months prior to the election showed that Propositions 101 and 104 had very little support and that Proposition 103 had the most support. The combination of these, or similar, prior beliefs and the

Proposition 103 called for the removal of the insurance industry's anti-trust exemption, public hearings as a prerequisite for rate changes, the termination of a territorial rating system (i.e., auto insurance premiums determined primarily by driving record), a premium discount for "good drivers," election of the state's insurance commissioner (rather than gubernatorial appointment), and, a mandatory minimum 20 percent reduction on all auto insurance premiums.[13]

Of the four initiatives that lost, one was sponsored by trial lawyer interests and three were sponsored by insurance industry interests:

> *Proposition 100* received 40.9 % of the vote and was sponsored by the California Trial Lawyers' Association. This proposition called for the reduction of "good driver" rates by 20 %, the institution of health insurance rate regulation, allowed banks to sell insurance and allowed claimants to sue insurance companies for acting in "bad faith." *Proposition 104*, the "no-fault" initiative, was the insurance industry's most favored proposition (i.e, The insurance industry spent much more to promote this proposition than it did to promote the others.) Despite this status it was approved by only 25.4 % of the voters. This proposition called for the establishment of a "no fault" system of auto insurance (thus eliminating the need for many types of legal recourse in the

limited overlap of Proposition 103 with Proposition 100 and 106 leads me to believe that there existed no "strategic vote" that would result in a better outcome for voters. Strengthening this belief is the fact that strategic voting is not mentioned in any of the campaign literature or media coverage that I am aware of.

[13]This component of Proposition 103 was revised by the State Supreme Court in 1989. The court mandated that insurance companies were allowed to earn a "reasonable rate of return." Insurance companies who believed that the mandatory reductions would threaten their ability to earn the "reasonable rate of return," could apply for an exemption from the reduction. Many companies have applied for the exemption. As of now, the result of these appeals has not yet been determined.

event of an accident), the reduction of some premiums by 20 percent for two years, a restriction on future insurance regulation legislation, limitations on damage awards against insurance companies, limitations on attorney contingency fees, and the preservation of the insurance industry's anti-trust status. *Proposition 101* received 13.3 % of the vote, was sponsored primarily by one insurance company and called for a temporary reduction of the bodily injury portion of insurance premiums, limits on injury claims for pain and suffering, and required that all other sources of compensation be exhausted before an insurance company is required to pay. *Proposition 106* received 46.9 % of the vote and was sponsored by the insurance industry. This measure placed limits on attorney contingency fees in tort cases.[14]

In the upcoming sections we consider the effect of political information on the voter's decision problem. To understand the circumstances under which the voters were operating consider that fact that the five insurance reform initiatives were part of a ballot that included elections for the office of president and U.S. Senator, seats in Congress, the State Senate and the State Assembly, local ballot measures as well as 22 other statewide measures.

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[14]In October 1987, after reaching an agreement with consumer representatives in order to avoid an initiative battle, an insurance industry spokesperson estimated that "We could spend $10 million and still not be assured of beating it" (from Kenneth Reich "Accord Over Revised Laws for Insurance Believed Near" *Los Angeles Times*, November 30, 1987, I:3,4) One wonders how the negotiations might have changed had the insurance industry and trial lawyers anticipated that campaign expenditures would total in excess of $80 million and that a consumer sponsored initiative would be the only resulting change to the status quo.

3.3 Sources of Political Information.

In this section, I consider the types of political information available to voters and I offer some theoretically based hypotheses that describe the effects of this information on voting behavior. Two types of political information are conspicuous in their absence from the case study. The first type of is the *partisan cue*. Not one of the initiatives had a party label attached to it. Neither of the major parties endorsed any position on any of the initiatives.[15] Some prominent figures of both parties took public stands on the insurance reform issue, but these endorsements provide no evidence of a clear partisan consensus. This absence is relevant in our attempt to characterize voting behavior since much of our understanding of voting behavior (especially that which we have learned from the study of national-level survey instruments) relies on the notion of voters taking cues from party labels.[16]

The second type of missing information is "*the past.*" Retrospective evaluations of the type considered by Downs (1957) or by Key (1966), and Fiorina (1981), help voters simplify their evaluations of different electoral alternatives and are dependent upon the existence of past histories. For instance, before a campaign begins, voters know that candidates have held either private sector jobs or public office and can evaluate a candidate's credibility and potential effectiveness by reviewing the candidate's past. While credibility is less of an issue for the content of a ballot initiative, whether or not a voter believes that a particular set of proposed changes will have a particular effect will be conditional on the outcome of an evaluation by the voter that is based on available information. This evaluation would

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[15]This was not unusual for the relationship between parties and the initiative process in 1988. It is only in 1990 that California party organizations have begun to take public stands on initiatives.

[16]The classic work on survey-based voting behavior research being Angus Campbell, Philip Converse, Warren Miller and Donald Stokes, *The American Voter* (New York: Wiley, 1960).

be easier to carry out in the presence of a past history. However, as is usually the case with the ballot initiative, no such history was available for this case study as none of the proposals had ever been law in California.

In addition to the absence of some common types of information, this case study included two sources of information that are not as common to the study of voting behavior. First, the state provided a *summary* of each of the initiatives. The summaries for the five insurance reform initiatives are reprinted as Figure 1 and were available in many places, including on the ballot itself.

[FIGURE 1 HERE]

The summaries were between 25 and 100 words long and were intended to help voters distinguish among the initiatives. Each summary provided some information about an initiative, but certain characteristics of the summary limited its effectiveness. Initiatives are often complex documents and the summary's brevity often results in the omission of important components of the measure (examples of such absences, and their effect on voter knowledge, are presented in Section 5). Notice, also, that the summary provided an estimate of the effect of the initiative's passage on the state treasury. For this particular issue, the effect on the state treasury would have to be highly correlated with the voter's cost of insurance, a much more salient piece of data, for the statement to be a useful source of information. The existence of any such relationship was never credibly established during the campaign.

A second source of state-provided information was the *"California Ballot Pamphlet."* The pamphlet for the November 1988 election was a large document containing the summary just described, signed arguments and counter-arguments for and against (four arguments per) each proposition, and the actual text of each proposition. The text of the

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100 INSURANCE RATES, REGULATION. INITIATIVE. Reduces good driver rates. Requires automobile, other property/casualty, health insurance rate approval. Adopts antiprice-fixing, antidiscrimination laws. Fiscal Impact: Additional state administrative costs of $10 million in 1988-89, paid by fees on insurance industry. Possible state revenue loss of $20 million.

101 AUTOMOBILE ACCIDENT CLAIMS AND INSURANCE RATES. INITIATIVE. Reduces automobile insurance rates, limits compensation for non-economic losses for four years. Fiscal Impact: Additional state administrative costs of $2 million in 1988-89, paid by fees on insurance industry. Possible state revenue loss of $50 million annually for four years.

103 INSURANCE RATES, REGULATION, COMMISSIONER. INITIATIVE. Reduces auto, other property/casualty rates. Requires elected Insurance Commissioner's approval of rates. Prohibits price-fixing, discrimination. Fiscal Impact: Additional state administrative costs of $10 to $15 million in 1988-89, to be paid by fees on insurance industry. Unknown savings to state and local governments from reduced insurance rates. Gross premium tax reduction of approximately $125 million for first three years offset by required premium tax rate adjustment. Thereafter, possible state revenue loss if rate reductions and discounts continue but gross premium tax is not adjusted.

104 AUTOMOBILE AND OTHER INSURANCE. INITIATIVE. Establishes no-fault insurance for automobile accidents. Reduces rates for two years. Restricts future regulation. Fiscal Impact: Additional state administrative costs of $2.5 million in 1988-89, paid by fees on insurance industry. Possible state revenue loss of $25 million annually for two years.

106 ATTORNEY FEES LIMIT FOR TORT CLAIMS. INITIATIVE. Limits amount of contingency fees which an attorney may collect in tort cases. Fiscal Impact: Net fiscal effect on state and local governments is unknown.

FIGURE 1 - Ballot Initiative Summaries

propositions included a considerable amount of technical "legalese." For the five insurance reform propositions alone, this information required over 300 double-spaced, 12-point type pages. The quantity of information contained in the pamphlet becomes even more impressive when we recall that it included all of this information for each of the 27 statewide ballot measures. That voters could obtain a great deal of information from the "California Ballot Pamphlet" is not in question. However, whether or not voters might reasonably be expected to spend the time and effort required to learn from the pamphlet is questionable, and undermines the effectiveness of this document.

Another source of information in the insurance reform elections was the three affected special interest groups: the insurance industry, the trial lawyers association and consumer activists. Recall, from Table 1, that over $82 million dollars were spent on the campaign. Most of this expenditure was directed at providing information to the voters. Table 2 details the names, preferences and expenditures of all the campaign organizations that were involved in the insurance reform campaign and registered with the State Board of Elections. Each organization is classified by the source of its funding (After reading through the campaign receipt and expenditure documents that were filed with the state, I can confidently assert that there did not exist an organization for which this classification was not obvious).[17] The stated preferences of each organization are listed in the first two columns.

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[17] All contributors of $25 or more must be listed by name and occupation in a campaign's contribution filings.

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Table 2-Expenditures by Contestant

Yes on	No on	INSURANCE	over $65 million
104, 106	100, 103	Citizens for No Fault	41,402,392
	100, 103	Californians Against Unfair Rate Increases	14,951,162
101		Consumers for Lower Auto Insurance Rates	5,401,934
106		Committee for FAIR Lawyers Insurance Fees	2,523,599
104		American Insurance Association	730,575
	100, 103	Committee for FAIR Auto Insurance Ratings	39,323
		TRIAL LAWYERS	over $15 million
100		Good Driver Initiative	13,786,653
	106	No on 106	624,449
	106	Consumer Coalition Against 106	401,704
	106	No on Proposition 106 Committee	172,737
	106	Consumer/Legal Equal Justice Committee	20,000
		CONSUMERS	under $2 million
103		Voter Revolt for Lower Insurance Rates	1,932,902
	101, 104, 106	Californians for Honest Insurance	24,005
100	101, 104, 106	Friends of Motorcycling	22,500
100	104	Santa Cruz Committee for Consumer Justice	6,117
		TOTAL	$82,040,002

This table reveals much more about the campaign than just dollars expended. It
also reveals interesting clues about the strategies chosen by the interest groups as well as
about the content of much of the available political information. Specifically, group names

provide a clear indication of the type of messages provided by all of the paid advertising:

> Groups that supported an initiative attempted to represent themselves, and their initiative, as pro-consumer, regardless of their true preferences or source of financial support. Groups that opposed an initiative represented the initiative they were campaigning against as anti-consumer.

There are two important implications of this strategy. First, the content of the paid advertisements, alone, should not have been that informative. When everyone claims to have the same preferences or claims to be the same "type" of information provider, the claim that one is of a certain "type," on its own, cannot provide any information to voters (i.e., it should not allow voters to distinguish among claimants). Only when the claim is accompanied by knowledge of the preferences of the information provider, can the content of the advertisement begin to provide any information to voters.

Second, despite the fact that all the major groups adopted names implying that they were consumer-oriented, if we consider the election as a battle over the distribution of insurance industry "surplus," then it is unlikely that either the insurance industry or trial lawyers held the interests of consumer/voters as their highest priority. In the advertisements purchased by these two groups, the identity of the sponsor was as well hidden as the law would allow. Except for the small print at the bottom of print advertisements or the rapidly disappearing disclaimer that surfaced in broadcast media, the fact that a particular message was associated with the preferences of the insurance industry or trial lawyers was not mentioned.

If we consider the nature of political advertisements, then the effect of advertisements on the behavior of incompletely informed voters can be better understood. Each political advertisement or other piece of political information, contained an "endorsement" - - *an*

action or statement made by some entity that implies one electoral outcome is better than another.[18] As defined, political advertisements contain endorsements, but endorsements do not have to come from political advertisements.

The effect that the content of an endorsement has on voting behavior is easy to see - - if you prefer low insurance rates to high insurance rates, you vote for the alternative that you believe will result in the lowest insurance rates. Of course, your beliefs depend on your information, which implies that they depend on what you know about the source of your information. An endorsement that comes from an entity whose preferences over the outcomes are unknown to the voter provides little opportunity for the voter to "cue" off of the endorsement. However, when the voter believes he understands the relationship between his preferences and those of the endorser's, then the content of the endorsement is a useful information "short cut". In this way, the endorser's identity can affect voting behavior. I use this idea about endorsements, which is based on the theoretical findings of McKelvey and Ordeshook (1984, 1985a) and Lupia (1990) as the foundation of the hypothesis tests that follow. In particular, I use the hypothesis tests and the survey instrument to demonstrate the following relationships.

- The electorate was not fully informed.

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[18]The effect of endorsements in politics has been incorporated into political science's effort to understand general principles of group decision making. McKelvey and Ordeshook (1984, 1985a, 1986) showed in a spatial 2-candidate election model that voters could use endorsements as a substitute for often complex "information on the issues." In the model developed in Lupia (1990) [Chapter 2 of this dissertation], I established that endorsements can be used as cues that allow voters to choose their full information preferred alternative. While the direct democracy model is very different from the two-candidate model, in the definition of an endorsement, the assumptions upon which the results depend, and the overall structure of the electoral model, demonstrates the effect of endorsements on voting behavior for a wide range of electoral environments.

- Indirect information, such as endorsements, affects voting behavior.

- *Voters with little or no substantive (issue-oriented) information can vote as if they fully understood the effects of different alternatives.* In this case, they do so using the information provided by credible endorsements.

3.4   Designing and Executing a Survey Instrument.

To execute the survey instrument, I recruited 30 undergraduates from the California Institute of Technology, California State University-Northridge and Pasadena City College. The pollsters received extra credit in political science and economics classes in exchange for attending two instructional sessions and administering the poll for four hours on Election Day.[19] We interviewed 339 voters in 10 Los Angeles County municipalities. Respondents were asked how they voted on the propositions, socioeconomic and insurance rate-related questions, and a series of questions designed to elicit the level of information (or confusion) each voter had on the issue. The information questions were designed to learn not only what voters knew about the issue of auto insurance reform and the sources of their information, but also to gauge their beliefs about the preferences of alternative information sources. A copy of the questionnaire is included as Appendix A.1.

Our sample is not large or diverse enough to make broad generalizations about voting behavior or the initiative process. Our purpose, however, was to contact voters with varying amounts of information, in order to find out how information influenced voting decisions. Financial and physical limitations led me to restrict our sampling to a 10-city

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[19]Lectures received a day off from lecturing in exchange for providing me with access to their students. I received low-cost pollsters in exchange for lecturing about the results of the exit poll in the students' classes.

area located in Los Angeles county centered about Pasadena. We chose polling places in areas across which there was a variance in the cost of auto insurance, the average number of accidents, and the cost of insurance claims.[20]. I assumed that these variables would be correlated with insurance rates, interest in the insurance reform issue and the propensity to obtain information. Given our constraints and goals, we were able to obtain a sample that includes enough variation to allow us to explore important relationships between key variables[21]

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[20]The sources used to make these evaluations included the following documents:

- "Preliminary Report on Private Passenger Automobile Liability Experience by Zip Code" California Department of Insurance, Los Angeles. May, 1988.

- Roxani M. Gillespie, Everett Brookhart and Khalid Al-Faris, "Study of the Availability and Affordability of Automobile Insurance in Los Angeles County: A Research Project of the Consumer Affairs Division, California Department of Insurance" July, 1987.

- California Department of Insurance, Statistical Services Unit, "Claim Cost for Bodily Injury and Property Damage Liability by Zip Code and County" May, 1988.

- California Department of Insurance, Statistical Services Unit, "Claim Frequency of Uninsured Motorist Accidents by Zip Code and County" May, 1988.

- California Department of Insurance, Statistical Services Unit, "Claim Frequency of Bodily Injury and Property Damage Liability by Zip Code and County" May, 1988.

[21]We directed the pollsters to use a randomizing mechanism to select respondents in the hope that this would dampen any selection bias. We instructed pollsters to choose every fifth exiting voter, with counting beginning only after an interview was completed. Respondents were given a 2-sided card presented during the interview. One side of the card had a description of each insurance proposition exactly as it appeared on the official ballot (also included in this paper as Figure 1). We allowed respondents to see the summaries during the interview in order to minimize the effects of variance in non-information related recall ability. The second side of the card was used for asking potentially sensitive and insurance rate-related questions. Instead of giving numbers for income, age, traffic violations or insurance premiums, respondents selected from lettered categories that were listed on the card. Pollsters worked in four hour shifts, and there was

Table 3 shows how our 339 respondents compared to the voters of Los Angeles county and the state of California.

Table 3-Election and Poll Results (% Voting for)

Proposition		Sponsor	State	LA County	CIT Poll
100	(The Good Driver Initiative)	LAW	40.9	50.4	44.3
101	(Polanco Initiative)	INS	13.3	15.5	10.8
103	(Voter Revolt/Nader Initiative)	CON	51.1	62.6	65.2
104	(The No-Fault Initiative)	INS	25.4	22.3	21.5
106	(Contingency Fee Initiative)	INS	46.9	43.6	29.4

3.5 What Voters Knew ...

Before analyzing the effect of information on voting, I will briefly review what respondents knew about the insurance reform issue. We asked our respondents 15 questions about automobile insurance reform. All of the questions asked respondents to identify the relationships among the three major interests (Insurance, Lawyers, and Consumers), the issues, and the propositions. Given the complexity of the issues and choices, and the fact that in addition to the 27 state measures, there were also numerous local measures and state and federal elected offices (including president) on the ballot, we were not surprised to find that our respondents tended to be confused. In the tables that follow, starred cell values refer to the number of correct responses. For some of the questions there are multiple correct answers and respondents were instructed to provide all responses they believed to be correct.

In the first set of information questions (9 - 11 on the questionnaire), we asked respon-

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no reward for the number of surveys completed. In the instructional sessions, we stressed careful execution of the polling as opposed to maximizing the number of respondents.

dents to identify the three primary interest groups with the proposition they supported. We asked respondents to identify Ralph Nader's preferences, rather than "consumer" preferences, because we believed that the former would provide a more uniform, and thus more informative, standard. The responses to each of these questions are displayed in Table 4.

Table 4 - Endorsement Questions

	100	101	103	104	106	DK
Which of the propositions do you believe were supported by the *insurance industry* ?	65	129*	39	171*	93*	61
Which of the propositions do you believe were supported by the *trial lawyers* ?	78*	35	26	27	58	119
Which of the propositions do you believe were supported by *Ralph Nader* ?	15	16	188*	15	10	71

We can first establish that the electorate was not fully informed by noticing that there are many incorrect responses (those that are not darkened and starred). Respondents were relatively knowledgeable about the relationship between Ralph Nader and Proposition 103, especially considering the extent to which the consumer activists were outspent during the campaign. Within our sample, 77% of respondents who volunteered one of the propositions as an answer, correctly identified Ralph Nader as a supporter of Proposition 103. Of all of the respondents who identified a supporter of Proposition 103, 82% made correct identifications.

Voters knew less about the relationship between the insurance industry and the propositions they sponsored. Only 48% of the respondents could correctly identify the insurance industry as a supporter of one of the three insurance-backed propositions. Only 10% identified all three insurance-supported propositions. Respondents were most unclear about the preferences and the role of the trial lawyers. Thirty five percent of respondents replied

"Don't Know" to the question about trial lawyer support, this is nearly double the percentage of "Don't Know" responses for either of the other groups. Of those who did venture a guess, only 35% provided correct responses. Of all of the respondents who identified a supporter of Proposition 100, the trial lawyer sponsored proposition, only 49% made correct identifications. Almost as many (41%) of those respondents who identified a supporter of Proposition 100 incorrectly identified its most active opponent, the insurance industry, as 100's supporter. The reason for the lack of respondent knowledge about the role of the trial lawyers would seem to be related to the relatively low-profile they adopted in the last two months of the campaign.[22]

In the second set of information questions (12 - 15 on the questionnaire), we asked respondents to match four prominent "endorsing" organizations to consumer activists, trial lawyers or the insurance industry. The responses to each of these questions are displayed in Table 5.

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[22]The insurance industry was able to stifle early trial lawyer attempts to advance their preferences by running a series of advertisements that pointed out the lawyer sponsorship of certain advertisements. This particular series of advertisements proved so effective that not only were lawyer sponsored campaign advertisements removed from the airwaves in the final weeks of the campaign, so were non-campaign related advertisements for trial lawyer services (at the request of the CTLA). Source: Kenneth Reich, "Lawyers Stop TV Ads," *Los Angeles Times*, October 15, 1988, I:31,1.

Table 5 - Endorsement Questions

	Consumers	Insurance	Lawyers	DK
Do you believe that *Ralph Nader* represents:	234*	11	7	50
Do you believe that the group called *Consumers for Lower Auto Insurance Rates* represents:	103	59*	27	116
Do you believe that the group called *Voter Revolt to Cut Insurance Rates* represents:	108*	32	27	136
Do you believe that the *California State Automobile Association* represents:	43	183*	8	70

Voters were very knowledgeable about Ralph Nader's representation and less knowledgeable about the other three groups. More than twice as many of our respondents were able to identify Ralph Nader as a representative of consumers than were able to identify the group that was responsible for Proposition 103, Voter Revolt. What is particularly interesting about the response to this question is the "generation gap" that influenced a respondent's "Nader IQ." While 83% of those over 25 answered correctly, only 67% of those 25 and under responded correctly. If we partition the electorate into the groups "25 and under" and "over 25," we can conduct a hypothesis test about the relationship between age and Nader IQ. The hypothesis: "Age makes no difference in the ability of a respondent to correctly answer question 12" assumes that there exists a single binomial distribution underlying the bernoulli process where individuals are randomly sampled from the groups "25 and under" and "over 25." Let p_{25-} be the probability that a randomly

selected "25 and under" respondent answers the Nader question correctly. Let p_{26+} be the corresponding probability for "over 25." The hypothesis "$p_{25-} = p_{26+}$ (Age makes no difference...)" can be rejected as the probability of its occurrence, given the data, is less than 5%.

"Consumers for Lower Auto Insurance Rates" was the insurance backed sponsor of Proposition 101. Fewer than 20% of the responses to the "Consumer ..." question provided a correct response.[23] We included the question about "AAA," as we believed that respondent priors would be that this organization would be a driver's advocate. We did not believe that many respondents would know that AAA was the state's fifth largest seller of automobile insurance. However, in the final weeks of the campaign, AAA sent out twice weekly mailings to all of its members in support of the insurance industry position and, thus, the awareness of AAA's preferences was much higher than we anticipated.

In the first set of issue or "content" questions (12 - 15 on the questionnaire), we asked respondents to identify specific proposed changes in the status quo with the ballot propositions. These changes were not equally salient, but all of the changes could significantly alter the price or expected return of an auto insurance policy. The responses to each of these questions are displayed in Table 6.

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[23]Whether or not a respondent could identify this group's representation made little difference in any aspect of the analysis. Given a chance to redesign the questionnaire, I would have substituted the name of this organization with that of another that would allow us to better separate the set of respondents who were informed from the set of respondents who were uninformed but cynical enough to guess the relationship.

Table 6 - Content Questions

	100	101	103	104	106	DK
Which proposition(s) establish a *no-fault* system of auto insurance ?	21	19	17	191*	8	54
Which proposition(s) mandate giving *discounts* in insurance premiums to *good drivers* ?	177*	35	65*	16	4	52
Which proposition(s) *limit attorney contingency fees* ?	7	13*	14	22*	193*	59
Which proposition(s) mandate insurance rates which are *not based on where you live* ?	56	19	88*	16	7	140

These questions provided effective ways of identifying respondents with different levels of information. One type of respondent was able to recall brand names, like Proposition 104, which was referred to as the "no fault" initiative, Proposition 100, which was known as the "good driver" initiative and Proposition 106, which was entitled "Attorney Fees Limit for Tort Claims." Respondents with a deeper knowledge of the alternatives knew that good driver discounts and attorney fee limitations were elements of propositions other than those for which the change was an element of the title.

We first asked respondents to identify the "no fault" proposition. The no fault initiative was the primary focus of the insurance industry's efforts. The no fault-104 connection was made in all of the paid media and was printed on the ballot card (see Figure 1) in full view of the respondents. We included this question to ensure that respondents could make one correct response.

Sixty percent of the respondents identified Proposition 100 as a "good driver" initiative. When we consider how few respondents could correctly identify Proposition 100's

sponsorship (Table 4), this figure might seem high; but the term "Good Driver Initiative" was used on virtually all of the "Yes on 100" media and the phrase "good driver" was used in the Proposition 100 ballot summary. Less publicized was the fact that Proposition 103 also included a "good driver" discount. Only 13% were able to identify 103 as providing a "good driver" discount, only 7% were able to identify both initiatives as providing a good driver discount.

We then asked respondents to identify the propositions that would limit attorney fees in insurance-related litigation. Two thirds of our respondents correctly identified 106, which is not surprising given its title on the ballot card. More representative of respondent knowledge of this issue may be the fact that only 4% and 8% also correctly identified Propositions 101 and 104, respectively, as limiting attorney fees. Fewer than 1% of our respondents identified all three propositions as limiting attorney fees.

Twenty-eight percent of our respondents were able to identify 103 as the measure that eliminated geographically-based pricing of insurance policies. Had this survey been conducted anywhere else inside California, but outside of the Los Angeles media market, it is not unreasonable to suppose that our respondents would have shown a greater awareness of this relationship. One focus of the insurance industry's "No on 103" campaign was convincing rural and Northern California voters that banning geographically-based pricing would transfer insurance costs from Los Angeles area drivers to the rest of the state. (That the author of 103 was from the Los Angeles area enhanced the credibility of this type of argument.) Proposition 103 won state-wide (by 1.13%), but obtained a majority in only 8 out of 58 counties. Not surprisingly, all of these counties fell within the Los Angeles and San Francisco metropolitan areas.

To explore this relationship, we provide a simple OLS regression and two way con-

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tingency table, using aggregate county level data, to show the different voting behaviors of Californians. The dependent variable in each of these cases is "% YES on 103." The independent variables are "% rural" and a binary "LA media market" dummy variable which =1 for counties served by only Los Angeles area television stations, = $\frac{1}{2}$ for counties partially served by Los Angeles television stations, and = 0 for all other counties. We should expect that the sign of the coefficient of "% rural" is negative because the ban on geographically-based rate determination implied by Proposition 103 would transfer the cost of insurance from urban to rural voters. Correspondingly, the sign of "LA Media" should be positive, owing to the difference in the insurance industry's campaign inside and outside of the Los Angeles area, and the presence of higher insurance rates in the Los Angeles area. The subscripts in the contingency table equal the number of counties included in each category.

Table 7 - Statewide Variation on Proposition 103 Vote

	Coeff.	(SE)
constant	44.92	(1.81)
% rural*	- 0.11	(0.03)
LA media*	10.70	(5.01)
R^2	.27	
N	58	

% "Yes on 103"	> 90 % urban	≤ 90 % urban
LA Media > 0	57.8_4	47.9_1
Non LA Media	49.6_{10}	40.0_{43}

The coefficients of "% rural" and "LA Media" are significantly different than zero and have the anticipated signs. The coefficients indicate that being a county that is included in the LA Media market raises the percent of the vote in favor of Proposition 103 by 10.7% and that the more rural a county is, the lower was the percentage of the vote that 103

could expect to receive. This relationship is verified in the crosstable on the right side of Table 7.

These data, then, support the contention that the urban/rural insurance cost transfer and the differences in the LA/non-LA advertising strategy of the "No on 103" influenced the behavior of voters statewide. Though we would have liked to have had some non-Los Angeles area rural voters in our sample, financial considerations prevented us from doing so. This intra-state difference should not affect the relationship between information preferences and voting for our sample.

In the fourth set of information questions (20 - 23 on the questionnaire), we asked respondents to identify certain proposed changes to the law with the primary interest group that supported the change. The responses to these questions are displayed in Table 8.

Table 8 - Content Questions

	R. Nader	Insurance	Lawyers
Which of the following favors the establishment of a _no-fault_ system of auto insurance ?	70	**172***	23
Which of the following favors giving _discounts_ in insurance premiums to _good drivers_ ?	**152***	73	**37***
Which of the following favors _limiting_ _attorney fees_ ?	71	**157***	37
Which of the following favors insurance rates which are _not based on where you live_ ?	**163***	29	30

In general, voters were better at providing correct responses to these questions than to any of the previous types. There is, however, enough variation in who knew what for

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these responses to be of use in the forthcoming analysis (Of the 298 respondents who replied to all four questions, only 5 provided all five correct responses). Of particular interest is that, despite the high respondent knowledge of the relationship between "good driver" discounts and Proposition 100 (Table 6), only 14% of our respondents identified good driver discounts as a lawyer-supported idea.

3.6 Testing for the Effect of Information.

In this section, I use the responses to the content and endorsement questions to identify the relationship between political information and voting behavior in the case study. I will demonstrate that content and endorsement information affected voting behavior and that insurance reform voters were able to use their knowledge of endorser preferences as a low-cost and effective substitute for high cost information. These relationships imply that information played an important role in the determination of voter strategies and that voters did not have to be well versed about the details of the insurance reform debate in order to vote in accordance with their own best interests.

Before proceeding, we note that our analysis assumes that voter preferences over electoral outcomes do not systematically vary with the propensity to possess certain types of information. Given the relationship between voters and information providers previously described, and the nature of the problem, this assumption seems to be relatively safe. Nearly all, 98.7%, of our respondents reported living in a household where a car was insured. Thus, it is likely that the intersection of the set of insurance consumers and the set of respondents is approximately equal to the set of respondents. For our tests, we assume that the intersection equals the set of voters and, therefore, can assert that our voters are also consumers. Correspondingly, we assume that all respondents preferred outcomes that

would result in lower premiums or higher returns (expected value of compensation in the event of an accident).[24]

We now test for the effect of information by comparing the voting behavior of four mutually exclusive, collectively exhaustive groups of voters.

Table 9 - Defining Voter Groups

CE	Voter can correctly answer CONTENT and ENDORSEMENT questions.
C	Voter can correctly answer CONTENT questions only.
E	Voter can correctly answer ENDORSEMENT questions only.
N	Voter can answer neither type of question correctly.

Respondents were labelled C ("Content") Voters if they could provide correct responses to at least half of the content questions that applied to a particular proposition. Respondents were labelled E ("Endorsement") Voters if they could provide correct responses to at least half of the endorsement questions that applied to a particular proposition. If a respondent satisfied both of the above conditions, he was placed in the CE ("Content and Endorsement") group. If a respondent satisfied neither condition, he was placed in the N ("Neither") group. In the upcoming analysis, these groups are defined independently for each proposition. That is, each voter is in one and only one group for each proposition. For example, a respondent may have been able to answer both content and endorsement questions about Proposition 100 (in group CE for Proposition 100), only content questions for Propositions 101 and 103 (in group C for 101 and 103), only endorsement questions for Proposition 104 (in group E for 104) and neither type of question for Proposition 106 (in group N for 106).

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[24]Two respondents in the sample admitted to working for insurance agencies. Both voted in a manner consistent with a "job security" hypothesis. Otherwise, there was nothing in the data that suggests that the preference hypothesis did not represent voter preferences.

I now compare the voting behavior of these four groups for each proposition. Support for the hypothesis that information has an effect on voting behavior is provided by observing significant differences in voting behavior across the four groups of voters for each proposition. To determine that endorsement information was informative we will need to reject the following hypothesis:

$H_0:$ $p_E = p_N$ The endorsement is non-informative.

Where p_E equals the probability that a randomly selected member of the group of "Endorsement" voters votes "Yes on Proposition X." p_N equals the probability that a randomly selected member of the group of "Neither" voters votes "Yes on Proposition X." That is, given the assumption that there should be no difference in preferences across the voter groups, the fact that "Endorsement" voters vote in a significantly different way than voters who could not answer either type of question indicates that endorsements affected voting behavior.[25]

I also want to establish that voters could use low-cost endorsement information as a substitute for higher-cost information. Support for this hypothesis is provided by observing no significant difference between the voting behavior of "Endorsement" voters and CE ("Content and Endorsement") voters. To do this we must reject the following (relatively weak) hypothesis test:

$H_0:$ $p_E \neq p_{CE}$ Endorsement is not a substitute.

Where p_{CE} equals the probability that a randomly selected member of the group of "Content and Endorsement" voters votes "Yes on Proposition X." That is, given the assumption that there is no difference in the preferences of the groups, and the assumption that voters who are the most informed are most likely to cast the same vote they would have if

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[25] A similar hypothesis would establish that content information has an effect on voting behavior.

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they possessed full information, then when "Endorsement" voters do not vote in a significantly different way than "Content and Endorsement" voters, this is consistent with the hypothesis that (low-cost) endorsements are an effective substitute for (high-cost) content information (or that by cueing off of the endorsements, voters can cast the same vote they would have if they had used the resources to obtain greater information, without actually having had to expend those resources).

Table 10a shows the proportion of each voter group voting "Yes" on each of the propositions. Table 10b shows the number of respondents in each category for each proposition.

Table 10a - Percent of Each Voter Group Voting "YES"

Proposition	Content and Endorsement	Content Only	Endorsement Only	Neither
100	33	46	41	44
101	6	6	13	38
103	64	69	65	42
104	17	17	20	39
106	10	28	4	43

[26]

Notice, first, that if neither content nor endorsement information influenced voter

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Table 10b - Number of Respondents in Each Group

Proposition	Content and Endorsement	Content Only	Endorsement Only	Neither
100	21	93	24	108
101	104	16	111	16
103	151	54	40	19
104	92	48	69	39
106	20	100	28	99

behavior, then there would be no significant differences in the cell values of each row. This is obviously not the case, especially when we compare "Neither" voters to all other voters. Second, with respect to the hypothesis that implies that the endorsement is non-informative ($p_E = p_N$), we can reject H_0 at the .05 level of significance for Propositions 101, 103, 104 and 106, but not for 100. The rejection of this hypothesis is inconsistent with p_E and p_N being means from two series of random draws from the same distribution and is consistent with the supposition that *voter knowledge of endorser preferences affected voting behavior.*

Third, the hypothesis "$p_{CE} = p_E$" could be rejected at the .10 level of significance for 100, but it could not be rejected at even the .20 level for any other proposition. The non-rejection of this hypothesis is consistent with the fact that *endorsement information was an effective substitute for more complete and costly information.*[27] In general, then, this analysis indicates that for four of the five propositions, political information significantly affected voting behavior and low-cost endorsement information was an effective substitute for higher-cost (or more complete) information. Now we move to a more rigorous analysis.

3.7   Testing the Effect of Endorsement Information.

In this section, I demonstrate that a voter's endorsement information was a significant determinant of voting behavior. In other words, I will show that in the face of multiple complex issues and low incentives to collect information, respondents used their knowledge of the preferences of the "information providing agenda setters" to cast a vote that

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[27]That the hypotheses fail for Proposition 100 does indicate that political information did not play as large a role in this election as the others. When we consider the low knowledge about Proposition 100 and its endorser, the trial lawyers (see Tables 4 and 10b (Columns CE and E)), then this lack of effect is less surprising.

corresponded with their full information best interests.

To test for the effect of endorsement information on voting behavior, I use a series of multivariate logit regressions. The regressions are presented in multiples of five, as in each case I have run one regression (or one set of regressions) for each of the five propositions. In each regression the dependent variable is labelled "Vote." "Vote" is a binary variable that equals 1 for a "YES" vote and 0 for a "NO" vote, where "YES" and "NO" refer to the Proposition. In the models presented, positive coefficients for the independent (explanatory) variables imply that having the characteristic that defines the independent variable is associated with a greater propensity to cast a "YES" vote. Our model was constructed to show both the effects of a respondent's endorsement knowledge and the effects of a respondent's insurance reform-related characteristics that could influence respondent preferences.[28] Endorsement information variables are capitalized, whereas non-capitalized variables represent insurance reform related factors that may influence respondents' preferences over outcomes. The model presented in this section is:

$$
\begin{aligned}
\text{Vote} \quad = \quad & \alpha + \beta_1 \text{INSURANCE} + \beta_2 \text{NADER} + \beta_3 \text{LAWYER} \\
& + \beta_4 violator + \beta_5 mv25 + \beta_6 cartype \\
& + \beta_7 income + \beta_8 republican.
\end{aligned}
$$

One of the independent variables allows us to explore the relationship between the respondent's knowledge of the insurance industry's preferences and the respondent's vote.

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[28] A second model, in Appendix A.3, includes the characteristics of the model chosen plus variables that represent the effect of issue-related knowledge. Including all of the issue-related variables and interactive variables that are consistent with the underlying model do not significantly alter the results presented in this section.

The variable INSURANCE is defined as follows:

$$\text{INSURANCE} = \begin{cases} 1 & \text{If the respondent can identify the insurance industry preference} \\ 0 & \text{otherwise.} \end{cases}$$

In the battle over insurance industry surplus, I expect that respondents and the insurance industry have, for the most part, different preferences over outcomes. If respondents believe that there exists such a difference they should cue negatively off of the insurance industry endorsement. Thus, the sign of the INSURANCE coefficient should be negative for insurance supported propositions (101, 104 and 106) and positive for insurance-opposed propositions (100 and 103). This variable is included in all five regressions, as the insurance industry was active in all five campaigns.

Another independent variable, LAWYER, which allows us to explore the relationship between the respondent's knowledge of trial lawyer preferences and the respondent's vote, is defined as follows:

$$\text{LAWYER} = \begin{cases} 1 & \text{If the respondent can identify the trial lawyer preference} \\ 0 & \text{otherwise.} \end{cases}$$

Since the trial lawyers were involved in the "Yes on 100" and "No on 106" campaigns, this variable is only included in the corresponding regressions. I expect the sign of this variable's coefficient to be negative, for the same reasons given in the explanation of the INSURANCE variable. This implies that the coefficient will be negative for Proposition 100 and positive for Proposition 106.

The third independent endorsement variable refers to Ralph Nader and is defined as follows:

$$\text{NADER} = \begin{cases} 1 & \text{If the respondent can identify Ralph Nader's preferences} \\ 0 & \text{otherwise.} \end{cases}$$

The relationship between the different measures and insurance industry or trial lawyer profitability is relatively clear compared to the relationship between different outcomes and Ralph Nader's utility. While it was clear that Ralph Nader's preferences over outcomes were different than those of the insurance industry, the relationship between trial lawyer preferences and Ralph Nader's preferences are much less so. Therefore, how respondents view the relationship between their preferences and Nader's should not be as clear to respondents as the equivalent relationships with the other two groups. I include this variable then, not because I believe that all respondents cue off of Nader in the same way, and not because the coefficient is significant in any of the following analyses (it isn't) but I include this variable because Ralph Nader was such a critical component of the "Voter Revolt" campaign for Proposition 103.[29]

Another group of variables is included that should help to determine respondent preferences over particular electoral outcomes. The following variables are included in all regressions.

$$
\text{violator} = \begin{cases} 1 & \text{If the respondent admitted to a traffic violation in the last 3 years} \\ 0 & \text{otherwise} \end{cases}
$$

Notice that violators have two important characteristics:

1. Violators have higher insurance rates, all other factors held constant.

2. Violators do not qualify as "good drivers."

That violators face higher premiums than non-violators suggests that the outcome of

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[29]Nader's direct involvement in the other campaigns is difficult to document and, thus, difficult to work into other regressions given the underlying model we are using, so I do not include this variable in the regressions of this paper. I have, however, run this set of regressions with the NADER and/or similarly defined Voter Revolt variable. Neither was ever statistically significant.

insurance reform elections will have a greater effect on violators than non-violators. The fact that violators pay relatively high premiums suggests that violators will prefer outcomes that lower rates or increase returns more than non-violators. This implies the sign of "violator" should be positive for Proposition 103 and negative for Propositions 101, 104 and 106. Violators should also be against propositions that provide discounts to good drivers, as such rules transfer the cost of insurance from non-violators to violators. This implies that the sign of "violator" will be negative for Propositions 100 and 103. *Since the two violator characteristics imply a conflict in violator preferences on Proposition 103, and there is no factor weighting scheme I can draw from the underlying theory, I am not predicting the sign of the "violator" coefficient in the Proposition 103 regression.*

$$\text{republican} = \begin{cases} 1 & \text{If Republican} \\ 0 & \text{otherwise} \end{cases}$$

Republicans in the California Assembly have tended to vote against any changes in the insurance laws that would lead to increasing the size or scope of regulatory bodies. Assuming a positive correspondence between the repeatedly manifested preferences of Republican assemblymen and constituent preferences, we expect Republican respondents to be against propositions that increase the state's regulatory power (100 and 103) and to be for propositions which restrict the state's regulatory power (101, 104 and 106 do by taking many types of settlement issues out of the hands of bureaucratic and legislative bodies).[30]

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[30] An additional set of variables is included in all but the Proposition 100 regressions (*mv25, cartype* and *income*). These variables are excluded from the Proposition 100 regression, because it is not clear that the sets of respondents with and without these characteristics should have been differently affected by its passage. I ran the Proposition 100 regression with these excluded variables. In that regression, there were minute changes in the coefficients of the previously included variables and the coefficients of the excluded variables were small and not statistically significant.

$$
\text{mv25} = \begin{cases} 1 & \text{If "violator"} = 1 \text{ and respondent is male and under 25} \\ 0 & \text{otherwise} \end{cases}
$$

The expected signs of the "mv25 coefficient" are the same as "violator." Male respondents who are under age 25 pay higher premiums than other violators. The outcome of insurance reform elections will have a greater effect on these respondents than on violators.

The variable *"cartype"* is a discrete variable with values 1 through 5. As cartype increases so does the retail price of the particular model. Since insurance rates are correlated with the price of the respondent's car, we expect that respondents having higher priced cars will be more affected by the electoral outcome than will respondents with lower priced cars. For all but Proposition 103, the expected sign of the "cartype" coefficient is the same as "violator." The sign of the "cartype" coefficient for the Proposition 103 regression should be positive as a 20% reduction on all rates should, all else held constant, provide a greater windfall to those who own more expensive cars.

The variable *"income"* is included as higher income persons tend to spend more on insurance policies. "Income" is a discrete variable that is valued 1 through 5 and increases with household income. Cutoff levels for each category were $ 15,000, $22,500, $ 40,000 and $75,000. The signs of "income" should be the same as the signs for "cartype."

Table 11a includes the regression results. The darkened, starred entries indicate that the coefficient is statistically significant at the .05 level. Accented entries indicate that the coefficient is a different sign than predicted. Standard errors are included in parentheses.[31]

[31] Because we have predicted that most of our dependent variables will have the same sign, the presence of multicollinearity should be accounted for. A singular value decomposition was run in order to determine the existence of collinearity, which would cause underidentification of the model. This test is explained in Belsley, Kuh and Welch (1980). The test failed to show significant levels of collinearity. (The highest value

Since logit coefficients do not provide much intuition about the absolute magnitude of the hypothesized relationships, I report the "first differences" of each coefficient in Table 11b. A "first difference" is a translation of the logit coefficients into percentages. In this study, a "first difference"[32] shows the change in the probability that a respondent casts a "Yes" vote that is caused by varying the value of one of the explanatory variables while holding all of the other explanatory variables constant at their mean. For example, a respondent who believed that the insurance industry supported Proposition 104 had a .15 lower probability of supporting the measure than a respondent who did not know that the insurance industry supported 104.

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of the SVD for any of the regressions of this section was 15.81. Values of over 100 indicate collinearity, values from 30 to 100 indicate mild collinearity and values under 10 indicate no collinearity.)

[32] A concise explanation of when and how this and related methods can make limited dependent variable model coefficients more intuitive is provided in Chapter 4 of King (1989).

Table 11a Effect of Endorsements and Rate Determinants on Voting Behavior

% YES on	100	101	103	104	106
Constant	-0.48	-1.78	-1.59	-1.05	-0.44
	(0.61)	(1.39)	(0.81)	(0.95)	(0.89)
INSURANCE	**1.37***	**-1.28***	**1.04***	**-0.43***	**-1.59***
	(0.31)	**(0.53)**	**(0.29)**	**(0.20)**	**(0.41)**
NADER	-	-	0.01	-	-
	-	-	(0.30)	-	-
LAWYER	**-0.58***	-	-	-	0.47
	(0.33)	-	-	-	(0.33)
traffic violator	-0.28	0.24'	0.10	0.06'	0.22'
	(0.32)	(0.60)	(0.32)	(0.39)	(0.36)
male under 25 violator	-	-8.38	0.28	-0.41	-0.23
	-	(47.21)	(0.30)	(0.38)	(0.31)
cartype	-	0.06	0.21	-0.17	-0.13
	-	(0.35)	(0.23)	(0.21)	(0.23)
income	-	-0.07	**0.32***	0.08'	-0.06
	-	(0.22)	**(0.14)**	(0.16)	(0.15)
Republican	0.06'	0.16	-0.06	0.46	**0.51***
	(0.44)	(0.48)	(0.30)	(0.34)	**(0.30)**
N	227	222	238	224	223
log likelihood	-143.74	-65.085	-145.48	-114.34	-123.53
% correctly predicted	65	90	70	78	69

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Table 11b - First Differences: Increase in the Probability of a "YES" Vote, Other Factors Held Constant

	From	To	100	101	103	104	106
Constant							
INSURANCE	does not know	knows endorsement	**32***	**-3***	**24***	**-15***	**-28***
NADER	does not know	knows endorsement	-	-	0	-	-
LAWYER	does not know	knows endorsement	**-14***	-	-	-	7
Traffic Violator	No	Yes	-5	1'	2	-1'	4'
MV under 25	No	Yes	-	-10	6	-8	-4
Cartype	compact	midsize	-	-2	4	-5	-3
HH Income (1,000)	$22.5 - $40	over $ 75	-	0	**14***	3'	-2
Republican	No	Yes	1'	0	-1	11	**5***

*	indicates significance at the .05 percent level or better
,	Indicates a different sign than predicted

In analyzing the regression results reported in Table 11, notice first that *knowledge of the insurance industry's endorsement is always a significant determinant and often the largest determinant of individual voting behavior.* The directionality of the signs of the INSURANCE variable is also quite descriptive of the relationship between respondent preferences and the insurance industry's preferences as perceived by respondents. Recall that the insurance industry supported Propositions 101, 104 and 106. Now notice that the coefficient of INSURANCE is negative and significant in each of these cases. Similarly, recall that the insurance industry was opposed to Propositions 100 and 103. In both of these cases the coefficient of INSURANCE is positive and significant. These results support the notion that respondents perceived the insurance industry's preference to be different than their own. This finding also reflects well on the insurance industry's attempt

to hide their identity, in that voters who could identify the insurance industry's preferences used them as negative cues. The magnitudes of the first differences suggest that insurance industry endorsements were important components of the voting calculus. Given the closeness of the vote on Proposition 103, a slightly more successful attempt to detach the insurance industry's identity from their endorsement may have lead to a different electoral outcome. Table 12 shows how respondents voted on each Proposition by whether or not they could identify the insurance industry's preferences. The cell values show the percentage voting "YES."

Table 12 - Insurance Endorsement and the Vote

Proposition	Position	INSURANCE = 1 (Knew Insurance Preferences)	INSURANCE = 0 (Did not know Ins. Preferences)
100	Against	55	33
101	For	6	14
103	Against	74	49
104	For	16	27
106	For	10	38

The effects of the Lawyer and Nader endorsements are far less clear than the INSUR-ANCE effect. and, in general, the non-endorsement variables are of the right sign but not significant.[33] The coefficient for LAWYER is significant in the Proposition 100 regression and significant at the .15 level in the 106 regression. Recall that the trial lawyers campaigned for Proposition 100 and against Proposition 106. Now, notice that the sign of the variable LAWYER is negative for Proposition 100 and positive for Proposition

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[33]Whether this is due to sample size or the overwhelming effect of endorsement information cannot be directly tested.

106. Again, this finding is consistent with the notion that respondents perceived the trial lawyer's preferences to be different than their own. This finding also reflects well on the trial lawyer attempt to hide their identity, as voters used lawyer preferences as negative cues.

The coefficient of NADER, while having the correct sign, is essentially zero. If we consider Nader's role in this election, the finding is not surprising, even though Nader's influence was significant. Ralph Nader is a credible figure (as verified by the fact that very few respondents gave incorrect responses to the Nader questions), and this credibility, I believe, was the consumer activist movement's greatest asset. Nader's value, however, was not as much due to the fact that he was a spokesman for Proposition 103, but rather that he was the only credible anti-insurance information provider. A review of Nader-related press coverage shows that he focused on the high levels of insurance industry campaign expenditure, as well as the relationship between insurance industry's preferred outcomes, insurance industry profits and insurance costs. Nader's credibility, and the media's apparent fixation with him, helped offset the insurance industry's resource advantage and prevented the insurance industry from monopolizing the transmission of low cost information.[34] This is a feat that I believe neither the trial lawyers or "Voter Revolt" could have accomplished on their own.

3.7.1 The Effect on Different Types of Voters.

If it is the case that endorsement information leads voters to vote as if they were fully informed, as was hypothesized earlier and supported by the comparison of voter groups in section 6, then endorsement information should have a greater effect on those respondents

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[34]As for Nader's influence on the outcome, one only has to realize that only 11 out of every 1000 voters would have had to cast a different vote to change the outcome of the vote on Proposition 103.

who do not possess content information. To test this hypothesis more thoroughly, we offer two regressions for each election, the results of which are presented as Table 13. One regression includes all respondents who satisfied the "Content" requirement (i.e., all respondents in the CE and C groups). A second regression for each proposition includes all respondents who did not satisfy the "Content" requirement (all respondents in the E and N groups). These two groups are mutually exclusive and collectively exhaustive.

There are ten regressions in all, one for each group and ballot proposition. This method of analysis is known in the econometrics literature as "switching regimes."[35] For ease of comprehension, I include only the "first differences" for the ten regressions. The darkened, starred cell entries indicate coefficients that are significantly different than zero. In each cell, the top number represents the first difference from the "Content" respondent regression and the bottom number represents the coefficient from the "No content" respondent regression. If endorsement information has a greater effect on "No content" respondents than on "Content" respondents, as I expect, then the lower cell entry will be greater than the upper cell entry for the endorsement variable coefficients.[36]

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[35]See Chapter 1 of Quandt (1976).

[36]Singular value decompositions were run for each regression to test for endogeneity. The highest value for any of the regressions is 26.2, which is below the value usually interpreted as a signal of mild collinearity.

Table 13 - First Differences: Increase in the Probability of a "Yes" Vote

(TOP - Content) (BOTTOM - No content)	From	To	100	101	103	104	106
INSURANCE	does not know	knows end.	-48 *	-1	-22 *	-3	-10
			-23 *	-9 *	-33 *	-8 *	-32 *
NADER	does not know	knows end.	-	-	-6	-	-
			-	-	18	-	-
LAWYER	does not know	knows end.	-35 *	-	-	-	-14
			4	-	-	-	-8
Traffic Violator	No	Yes	-14	-1	2	3	1
			-3	3	16	-2	13
MV under25	No	Yes	-	-4	3	5	-7
			-	-15	16	-25	5
Cartype	compact	midsize	-	1	-2	2	-14
			-	-1	27 *	-6 *	3
HH Income (1,000)	$22.5 - $40	over $ 75	-	0	20 *	10	6
			-	0	-1	2	-7
Republican	No	Yes	-6	0	-3	-2	8 *
			7	-1	-15	-6 *	1
N (Content)			101	108	180	121	108
N (No Content)			116	106	50	96	106
% correctly predicted (C)			73	95	69	83	76
% correctly predicted (NC)			63	84	72	82	68

Table 13 verifies that endorsement voters relied heavily on their knowledge of the insurance industry's preferences to make their voting decisions. In every case, the INSURANCE variable is significant for "No Content" voters, whereas this variable is significant only in two of the five cases for "Content" voters. For four of the five cases (101, 103, 104 and 106), the effect of knowing the insurance industry's preferences was a much greater determinant of voting behavior for "No Content" voters than it was for content voters.

The only other endorsement variable that has a significant coefficient is LAWYER for "Content" Voters in Proposition 100. That it is significant for this group and not for the "No Content" group is a surprise. However, when we consider the relatively poor information that respondents possessed about the role of the lawyers in the elections, it is possible that in identifying those who knew the lawyer preferences, we may have captured respondents who were well informed about many aspects of the election.

3.8 Summary

The survey instrument described in this chapter is designed to find out what voters knew about insurance reform and information providers. An analysis of the data generated allows the following conclusions:

1. **Information influenced voting behavior.** Voters with some information, either Content, Endorsement, or both, voted differently than those who did not.

2. **Some voters were able to substitute endorsement information for content information.** In other words, they were able to vote as though they knew what outcome was best for them, without making the effort to obtain this information.

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3. **That some voters substitute "Endorsement" information for more complex "Content" information provides evidence that voters may be both uninformed about the issues and able to cast correct votes.**

4. **Voters use insurance industry and trial lawyer endorsements as negative references.** Thus, the attempt by these interests to hide their identities appears *ex post* to be rational.

5. **In general, the insurance industry's endorsement was the largest (significant) determinant of the vote.** This was especially true for voters who did not possess content information.

This survey instrument has allowed us to to establish that certain endorsements were effective substitutes for full information. That is, the endorsements provided voters with enough information to cast the same vote they would have if they were fully informed. This result is not meant to imply that endorsements will be as effective in other case studies. The effectiveness of the endorsement will depend upon the preferences of its source and voter knowledge of these preferences and voter priors. A more general characterization of the effect of endorsements comes from the formal model constructed in Lupia (1990). In that paper, whether or not certain types of low-cost information are available can determine both whether or not voters cast "correct" (or full information) votes and whether or not the direct democracy outcome is the policy outcome that would have occurred if all voters had full information about all of the outcomes. In cases where the relationship between the preferences of information providers and voters are known to voters, then the theoretical results, along with the results of this section support the implication that voters will be able to substitute low-cost information for high-cost information and cast the vote they would have if they had used the resources necessary to obtain the high cost

information.

Bibliography

[1] Belsley, David A., Edwin Kuh and Roy E. Welch (1980). *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity.* New York: Wiley.

[2] Berelson, Bernard R., Paul F. Lazarsfeld and William N. McPhee (1954). *Voting: A Study of Opinion Formation in a Presidential Campaign.* Chicago: University of Chicago Press.

[3] California Department of Insurance (1988). "Preliminary Report on Private Passenger Automobile Liability Experience By Zip Code" Los Angeles, California.

[4] California Department of Insurance, Statistical Services Unit (1988a). "Claim Cost for Bodily Injury and Property Damage Liability by Zip Code and County" Los Angeles, California.

[5] California Department of Insurance, Statistical Services Unit (1988b). "Claim Frequency of Uninsured Motorist Accidents by Zip Code and County" Los Angeles, California.

[6] California Department of Insurance, Statistical Services Unit, (1988c). "Claim Frequency of Bodily Injury and Property Damage Liability by Zip Code and County" Los Angeles, California.

[7] Campbell, Angus, Philip Converse, Warren Miller and Donald Stokes (1960). *The American Voter*. New York: Wiley.

[8] Downs, Anthony (1957). *An Economic Theory of Democracy*. New York: Harper and Row.

[9] Fiorina, Morris P. (1981). *Retrospective Voting in American National Elections*. New Haven: Yale University Press.

[10] Gillespie, Roxani M., Everett Brookhart and Khalid Al-Faris (1987). "Study of the Availability and Affordability of Automobile Insurance in Los Angeles County: A Research Project of the Consumer Affairs Division, California Department of Insurance" Los Angeles, California.

[11] Key Jr., V.O. (1966). *The Responsible Electorate*. New York: Vintage.

[12] King, Gary (1989). *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. Cambridge: Cambridge University Press.

[13] Lupia, Arthur (1990). "Direct Democracy, Majority Rule and the Will of the Majority" Mimeo, California Institute of Technology.

[14] McKelvey, Richard D. and Peter C. Ordeshook (1984). "Rational Expectations in Elections: Some Experimental Results Based on a Multidimensional Model" *Public Choice*, 44, 61 - 102.

[15] McKelvey, Richard D. and Peter C. Ordeshook (1985a). "Sequential Elections with Limited Information" *American Journal of Political Science*, 29, 480 - 512.

[16] McKelvey, Richard D. and Peter C. Ordeshook (1985b). "Elections with Limited Information: A Fulfilled Expectations Model Using Contemporaneous Poll and Endorsement Data as Information Sources" *Journal of Economic Theory*, 36, 55 - 85.

[17] McKelvey, Richard D. and Peter C. Ordeshook (1986). "Information, Electoral Equilibria and the Democratic Ideal" *The Journal of Politics*, 48, 909 - 937.

[18] Popkin, Samuel, John W. Gorman, Charles Phillips, and Jeffrey A. Smith (1976). "Comment: What Have You Done for Me Lately? Toward An Investment Theory of Voting." *American Political Science Review*, 70, 779 - 805.

[19] Quandt, Richard E. and S. M. Goldfeld (1976). *Studies in Nonlinear Estimation.* Amsterdam: North-Holland.

[20] Reich, Kenneth (1987a). "Insurance Lobby Study Cites Large Gifts to Politicians by Trial Lawyers" *Los Angeles Times*, June 20, I:3,1.

[21] Reich, Kenneth (1987b). "Accord Over Revised Laws for Insurance Believed Near" *Los Angeles Times*, November 30, I:3,4.

[22] Reich, Kenneth (1988a). "Nader Backs 'Voter Revolt' over Insurance, Takes Swipe at Lawyers" *Los Angeles Times*, January 30, I:29,1.

[23] Reich, Kenneth (1988b). "Bid to Qualify Five Insurance Initiatives is in High Gear" *Los Angeles Times*, February 15, I:3,4.

[24] Reich, Kenneth (1988c). "Lawyers Stop TV Ads" *Los Angeles Times*, October 15, I:31,1.

[25] Romer, Thomas and Howard Rosenthal (1978). "Political Resource Allocation, Controlled Agendas, and the Status Quo" *Public Choice*, Volume 33, 27 - 44.

[26] Romer, Thomas and Howard Rosenthal (1979). "The Elusive Median Voter" *Journal of Public Economics*, Volume 7, 143 - 170.

[27] Selten, Reinhart (1978). "The Chain Store Paradox" *Theory and Decision*, 9, 127 - 159.

Chapter 4

Political Information, Political Behavior and Policy Outcomes in Direct Democracy: An Experimental Study.

4.1 Introduction.

The central question that confronts us is:

> *"Is direct democracy a decision making mechanism that converts majority preferences into policy outcomes or is it a tool of special interest groups that can be used to subvert the will of the majority?"*

Intuition suggests, and the theory in Lupia (1990) [Chapter 2 of this dissertation] establishes, that in addition to the institutional setting and participant preferences, information (its' content, source, amount available and distribution across electoral participants) affects voting behavior and direct democracy outcomes in non-trivial ways. The model is used to show that as voters receive more and better political information, the probability that the *full information majority preferred alternative* (denoted "FIMPA" and defined as the outcome, among those offered, that a majority of voters would have chosen if they were fully informed) will be the direct democracy outcome increases.

Using laboratory experimentation, this chapter provides empirical support for the theory developed in Lupia (1990). Thus, this chapter, like the last, offers an individual level data set that allows us to observe how information affects strategies and outcomes in a direct democracy. The benefits of complementing the theoretical construct, and empirical support already provided by the survey instrument, with experiments are substantial. A laboratory experimental setting allows us to control many elements of the political landscape that are impossible to control with a survey instrument. An important example is voter preferences. In order to isolate and identify the effect of information on direct democracy, we must be able to identify the effect of voter preferences on strategies and outcomes. The use of experiments makes individual voter preferences easier to control and document. Overall, the combination of surveys and laboratory experiments used allows a more comprehensive test of theory than would be possible through the exclusive use of either instrument.

The chapter is organized as follows: Section 4.2 reviews the components of the theoretical construct upon which the experiment is based. Section 4.3 provides details about the experimental design. Section 4.4 presents and analyzes the experimental results. Section 4.5 offers some concluding remarks. Other details of the experiment are included in

Appendix B.

4.2   A Model of Direct Democracy (Experiment Version.)

A brief review of the elements of the theory upon which the experimental design is based will help to provide a clearer understanding of the objectives of the experimental design. A model of direct democracy presented in Lupia (1990) represents the electoral environment as a non-repeated game in which the players are (1) an agenda setter, who proposes ballot measures, and (2) voters, who decide whether a pre-existing status quo or an alternative proposed by the setter will become the policy that determines payoffs for all players. In different versions of the model, information parameter values are varied in order to allow us to ascertain the relationship between political information, voting behavior and policy outcomes.

Consider the policy space $X \subseteq \Re$, a closed, convex interval. Let X be normalized so that we can represent the policy space by the interval $[0, 999]$:

X = [0, 999]   normalized one-dimensional policy continuum

In our model, there are $n + 1$ players where n of the players, ($N = \{1, \ldots, n\}$, n large, finite and odd), are called "voters" and one player, $J = \{0\}$, is called the "setter." The set of players in the model is, thus,

$$N' = N \cup J = \{0, 1, \ldots, n\}.$$

Nature draws player types from common knowledge distributions. We first denote the determination of the setter's type. Let $\chi_0 = [0, 999]$ be the set of possible setter types. Let $F : [0, 999] \to [0, 999]$, be the common knowledge cumulative distribution function of

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setter types that has density, f. That is, for any $X_0 \in \chi_0$,

$$F(X_0) = \int_0^{X_0} f(x)dx.$$

Nature draws once from this distribution. The draw determines $X_0 \in [0, 999]$, the agenda setter's type. In the model, the setter's type, X_0, is her private information and the distribution F serves as the basis for all prior beliefs that voters have about the setter's type.[1] Since Nature draws only once from F, the distribution may not provide an accurate representation of the point, X_0.

We now denote the determination of voter types. Nature makes n independent draws from a single common knowledge distribution in order to determine each voter's type. Let $\tau_i = [0, 999]$ be the set of possible voter types. Let $G : [0, 999] \to [0, 999]$, be the common knowledge cumulative distribution function of setter types that has density g. That is, for any $T_i \in \tau_i$,

$$G(T_i) = \int_0^{T_i} g(t)dt.$$

$T_i, (i \in N)$, is voter i's type. While each voter's type, T_i, is private information to them, G is common knowledge. Thus, *all players know their own types* and *do not know any other voter's type*, but *do know the distribution from which other voter types are drawn*.

Nature simultaneously chooses the game type and the location of the "status quo" ($SQ \in [0, 999]$) and announces them to all of the players. The game types that Nature can choose differ in either the actions that the setter and Nature are permitted to take or in the observations that voters can make. All players know the game type, with certainty,

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[1]This representation of setter preferences allows a general representation of player prior beliefs. When F is uniformly distributed, voters will assume that all possible setter types can be drawn with equal probability. When F has all of its mass on one point, the voter's priors are fully informative (X_0 is common knowledge). A belief that referendum sponsors have a tendency towards extreme views can be represented by a density function $f(X_0)$ with two peaks, one near each endpoint of the policy space.

when it is their turn to choose a strategy.

After Nature determines player types and announces SQ and the game type, the setter chooses a strategy. The setter's strategy set, S_0, for each type of game follows.

Game Type	Setter Strategy Set
All	$S_0 = \{s_0 \vert \text{where } s_0 : \chi_0 \rightarrow \{0,1\} \times [0,999]\}$

The particular strategy chosen by the setter takes the form:

$$s_0(X_0) = (s_{01}(X_0), s_{02}(X_0)).$$

The setter's strategy, s_0, has two components. The first component of the strategy, $s_{01}(X_0)$, is whether or not to contest the election. In this model, the decision to contest the election is non-trivial because the setter will face a non-negative, common knowledge *cost of entry*, $K \in \Re^+$, if he decides to contest. We define the *setter's entry decision* as

$$s_{01}(X_0) \in \{0,1\},$$

which equals 1 if the setter decides to contest the election, and equals 0 if the setter chooses not to contest the election. The second component of the setter's strategy, $s_{02}(X_0) \in [0,999]$, is to choose a location for the "alternative to the status quo." If the setter decides not to contest the election, $(s_0(X_0) = (0, SQ))$, the game ends. For notational convenience, we denote $s_{02}(X_0) = SQ$, when $s_{01}(X_0) = 0$ (i.e., the setter chooses to accept SQ). Otherwise $s_{01}(X_0) = 1$, the setter enters and chooses $s_{02}(X_0)$.

After the setter moves, the voters choose a strategy. All actions taken by and all information obtained by voters is assumed to be costless to them. The voter strategy sets, $S_i (i \in N)$, in each type of game follow.

Game Type	Voter Strategy Set
NI, CE	$S_i := \{v_i | \text{where } v_i : \tau_i \times \{0,1\} \rightarrow \{-1,1\}\}$
FI	$S_i := \{v_i | \text{where } v_i : \tau_i \times [0,999] \rightarrow \{-1,1\}\}$

NI	No Information Transmitted
CE	Costly Setter Entry
FI	Full Information

Voters can condition their strategy on information provided to them about $s_0(X_0)$. Let the space of possible messages be denoted as $\bar{M}$ where:

$$\bar{M} = \{0,1\} \quad \text{for NI and CE games.}$$

$$\bar{M} = [0,999] \quad \text{for FI games.}$$

For any $T_i \in \tau_i$ the particular strategy chosen by voter i in the NI and CE games take the form:

$$v_i(T_i, s_{01}(X_0)).$$

For any $T_i \in \tau_i$ the particular strategy chosen by voter i in the FI game takes the form:

$$v_i(T_i, s_{02}(X_0)).$$

A voter's strategy is a binary decision, $v_i = \{-1,1\}$, where $v_i = -1$ represents a vote for SQ and $v_i = 1$ represents a vote for $s_{02}(X_0)$. Voters observe the message $M(s_0, X_0)$. The value of $M(s_0, X_0)$ is revealed to voters after the setter chooses s_0 but before the voters vote. In the NI and CE games, the message reveals whether or not the setter has decided to contest the election. In the FI game, the message reveals the location of the alternative chosen by the setter.

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In all of the games, the winning outcome becomes the policy, where that outcome is determined as follows:

$$O : [0, 999] \times \{-1, 1\}^N \quad\longrightarrow\quad [0, 999].$$

For any $x \in [0, 999]$, $v_i \in \{-1, 1\}$

$$o(x, v_1, \ldots, v_n) \quad=\quad x \qquad \text{if: } \sum_{i=1}^{n} v_i > 0$$

$$\quad=\quad SQ \qquad \text{if: } \sum_{i=1}^{n} v_i \leq 0$$

The outcome $o(s_0, v_N(T_N, X_0))$ where

$$s_0 = \{s_{01}(X_0), s_{02}(X_0)\}, T_N = T_1, \ldots, T_N \text{ and } v_N = \{v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_1, M(s_0, X_0))\},$$

determines the payoffs to all players.[2] In this model, all players have symmetric and single peaked utility functions. The single peak in a player's utility function is called an "ideal point." The location of player ideal points on $[0, 999]$ is a function of a player's type. In this paper, a player's type will only determine the location of their own ideal point.[3] Therefore, we denote $T_i \in [0, 999]$ as voter i's ideal point and $X_0 \in [0, 999]$ as the setter's ideal point. Since a player's type is their own private information, then, so is the location of that player's ideal point. We define the *voter utility function*, $(U : \Re \times \tau_i \rightarrow \Re)$, for player $i \in N$ to be $\forall x \in [0, 999]$ and $T_i \in \tau_i$.

$$U(x, T_i) = -(x - T_i), \text{ and,}$$

and the *setter utility function* to be

$$U(x, X_0) = -(x - X_0).$$

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[2]We have assumed the SQ wins ties. This assumption is consistent with the tie-breaking rule used in all of the state and local level direct democracy electoral rules that the author is aware of.

[3]Thus, for this paper, voters are alike in every other way. Voter types will determine other parameters in extensions of this model.

Player *payoff functions* equal their utility minus any costs the players incur through their choice of strategy. Since all voter actions in this model are costless, the voter payoff and utility functions are equivalent. The setter's payoff function includes the cost of contesting the election. Cost K is incurred by the setter if and only if the setter decides to contest an election. The voter payoff function is:

$$\phi_i(s_0, v_1, \ldots, v_n | X_0, T_1, \ldots, T_n) =$$

$$U_i[o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0))), T_i],$$

and the setter payoff function is:

$$\phi_i(s_0, v_1, \ldots, v_n | X_0, T_1, \ldots, T_n) =$$

$$U_0[o(s_{02}(X_0), v_1(T_1, M(s_0, X_0)), \ldots, v_n(T_n, M(s_0, X_0))), X_0] - K \times s_{01}(X_0).$$

For voters, utility is solely a function of the distance between the location of the winning policy and their ideal point. Notice that the setter's utility function is not affected by winning or losing the election except for the influence that the electoral outcome has on the position of the winning policy. All utility functions have a lower bound over $[0, 999]$. [4]

To characterize voter strategies, setter strategies and the direct democracy outcome, we utilize a Bayesian type equilibrium concept. The direct democracy equilibrium concept of Lupia (1990) is defined as a set of strategies $s_0 \in S_0, v_i \in S_i$, and voter beliefs

[4] When using linear utility functions the function $H(T_i)$ is continuous but is not smooth, making a proof for the general case (i.e., equivalent to that presented for quadratic utility) quite unwieldy. In Table A, the decisive point for each experiment has been calculated using the formula given above.

Experiment	FI	NI	CE10	CE20
1	420	600	600	600
2	650	548	548	548
3	770	776	776	776
4	610	471	471	471

$f(X_0|k,j)$, such that for each $(k,j) \in \bar{M}$:

Setter: $\forall X_0$, $s_0(X_0) = (s_{01}(X_0), s_{02}(X_0))$ satisfies: $\max_{s_0 \in \{0,1\} \times [0,999]}$

$$\Phi_0(s_0, M(s_0, X_0)|X_0) = \begin{cases} U_0(SQ, X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) \geq \frac{1}{2} \\ U_0(s_{02}(X_0), X_0) - (K \times s_{01}(X_0)) & \text{if } \int_{C(SQ, M(s_0, X_0))} dG(T) < \frac{1}{2} \end{cases}$$

Voters: $\forall T_i$, $(i \in N)$, and $\forall (k,j) \in \bar{M}$, $v_i(T_i, k, j)$ satisfies:

$v_i = 1$ if $\int_0^1 U_i(s_{02}(X_0), T_i)dF(X_0|k,j) > U_i(SQ, T_i)$

$v_i = -1$ otherwise

Beliefs: $\forall (k,j) \in \bar{M} : f(X|k,j)) = \begin{cases} \frac{f(x)}{pr(k,j)} & \text{if } x \in A(k,j) \\ 0 & \text{otherwise} \end{cases}$

where $pr(k,j) = \int_{A_{(k,j)}} F(x)dx$.

Where $\forall M(s_0, X_0) \in \bar{M}$, $s_0 \in S_0$ and

$$C(SQ, M(s_0, X_0)) = \{T_i \in [0,1] : \\ \int_0^1 U_i(s_{02}(X_0), T_i)dF(X_0|M(s_0, X_0)) \leq U_i(SQ, T_i)\}, \text{ and,}$$

$$C(s_{02}(X_0), M(s_0, X_0)) = [0,1] - C(SQ, M(s_0, X_0)).^5$$

4.2.1 How Voters Make "Mistakes."

The "full information minority-preferred alternative" is the direct democracy outcome if and only if a set of decisive voters makes a "mistaken" inference about the spatial relation of T_i, X_0 and SQ. A voter makes a "mistaken" inference when:

$$\int_0^1 U_i(X_0, T_i)dF(X_0|M(s_0, X_0)) > U_i(SQ, T_i) > U_i(X_0, T_i).$$

That is, the *expected* utility of the setter's proposal is greater than the *known* utility from the SQ, while, in fact, the *known* utility from the SQ is greater than the *actual* utility a voter will receive from the true alternative, X_0. Until voters are fully informed, they can make this type of mistake with positive probability and the full-information *minority* preferred alternative can be the direct democracy outcome. When comparing the experimental results across game types, our analysis of the set of "mistaken" voters will allow us to better characterize the relationship between the "will of the majority" and the direct democracy outcome.

4.2.2   Experiment Game Types.

We examine the effect of information on direct democracy by recreating three of the game types developed in the previous theoretical work in an experimental environment. Each successive game type is a variation of the basic model that allows voters to form a strategy with more information than they had in previous game types. A comparison of strategies and outcomes across the game types, then, allows us to identify the effects of information on direct democracy. In all of the game types voters are fully informed about the SQ. What varies is the voters' information concerning the location of the alternative ($s_{02}(X_0)$) and the cost to the agenda setter of contesting the election, K. Proofs of the propositions that are referenced and stated are included in Lupia (1990).

4.2.3   "No Information Transmitted" (NI) Game.

In the NI game, voters do not observe the location of $s_{02}(X_0)$. The cost to the setter of entering the election, K, is zero and this fact is common knowledge. Voters of this game type possess less information, and should be more likely to cast mistaken votes

all other factors held constant, than do voters of any other game type of this chapter. The equilibrium for this game types has been shown to be the following combination of strategies and beliefs:

Proposition NI:

> *The equilibrium of the NI game is:*
>
> $\forall X_0 \in \chi_0 : \quad s_0(X_0) = (1, X_0)$
>
> $$\forall T_i \in \tau_i : \quad v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } \int_0^1 [U_i(X_0, T_i) f(X_0 | M(s_0, X_0))] > U_i(SQ, T_i) \\ & \text{and } M(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$
>
> Beliefs can be characterized by $f(X_0 | M(s_0, X_0)) = f(X_0)$.

Characteristics of the NI Equilibrium.

- The setter contests the election and chooses his ideal point as the ALT.

- Voters maximize utility by voting sincerely between SQ and the lottery which is a function of their beliefs about the location of X_0.

- Whichever of $\overline{X}$, the mean of $f(X_0)$, and SQ is closer to T_{MV} is the NI outcome. Note that this outcome is independent of the actual location of X_0.

Lemma 2 of Lupia (1990) implies the following:

> *In the NI and CE games, a weakly dominant location strategy for the setter*
>
> *is $s_{02}(X_0) = X_0$.*

That is, when voters are uncertain about the location of the alternative when it is their turn to vote, the setter can benefit from *both* his agenda setting opportunities *and* his

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superior (asymmetric) information. In the incomplete information direct democracy game, the setter can costlessly cheat (choose a policy that the median voter does not prefer to some other range of points) on any implicit agreement that the electoral contestants and any subset of voters might make. Of course, if the game is repeated, then agreements may become enforceable through subsequent punishments. However, in "single shot" incomplete information direct democracy games, such as the one we model here, a voter can neither provide the setter with incentives not to cheat nor punish the setter for cheating. Therefore, the setter has no incentive to converge to either the median voter's ideal point or a point that the median voter prefers to SQ. Only when voters have enough information to reward the setter for his choice of policy should we observe any type of median voter-influenced result. Thus, the setter can ignore all voter preferences in the NI game since such information is not available.

4.2.4 "Costly Entry" (CE) Game.

In the CE game, voters do not observe $s_{02}(X_0)$ but do observe $K > 0$.

Lemma 1 of Lupia (1990) states:

In all game types of this chapter,

$$\forall X_0 \in \chi_0 : s_0(X_0) = (1, s_{02}(X_0)) \text{ dominates } s_0'(X_0) = (0, s_{02}(X_0))$$

$$\iff \Phi_0(s_0, M(s_0, X_0)|X_0) \geq \Phi_0(s_0', M(s_0', X_0)|X_0).$$

From this lemma we know that the setter should contest the election if and only if he expects to receive a positive return from contesting the election. If the setter believes that contesting the election will provide negative returns, then he should not make any costly

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effort to contest the election and should simply accept the utility that results from SQ as the policy outcome. When the cost of contesting the election is positive, the fact that the setter challenges SQ sends a message to voters that the setter believes that he can recover at least the cost of contesting the election. Voters can infer that $s_{02}(X_0)$ is not within a well specified range of SQ. Let $\epsilon(K) = \epsilon$ be the distance from SQ within which any alternative does not provide enough extra utility to cover the cost of the election. Voters know that $s_{02}(X_0)$ is not in the range $[SQ - \epsilon, SQ + \epsilon]$, as even in the case where $s_{02}(X_0)$ wins the election, insufficient utility is gained by the setter to make contesting the election a profitable endeavor. Voters use this information to update their beliefs on the location of the $s_{02}(X_0)$ by eliminating the "range of unprofitable alternatives" from their beliefs about potential locations of the $s_{02}(X_0)$. When $K > 0$ and $s_{01}(X_0) = 1$, voters know that $X_0 \notin [SQ - \epsilon, SQ + \epsilon]$ and that the distribution $F(X_0)$ has no support over this range.[6] This updating leads to a revised distribution of setter types $F(X_0|1))$, which is related to $F(X_0)$ in the following way (and displayed in Figure 1):

$$f(X_0|1) \quad = \quad 0 \qquad\qquad\qquad\qquad\qquad\qquad [SQ - \epsilon, SQ + \epsilon] \in X$$

$$f(X_0|1)) \quad = \quad f(X_0) \times \tfrac{1}{1-F(SQ+\epsilon)+F(SQ-\epsilon)} \quad [0, SQ - \epsilon), (SQ + \epsilon, 1] \in X$$

When voters observe no entry, they know that the SQ will be the outcome with certainty. Let $Q(SQ)$ be the distribution of SQ. It is common knowledge that this distribution always has all of its mass at one point, SQ, therefore: $f(X_0|0) = Q(SQ)$. The range of unprofitable alternatives, the updated voter prior and updated expected utility for the

---

[6] Voters use Bayes' Rule to update their beliefs about the location of X_0.

$$p(X_0 = x \in [0,1] | s_{01}(X_0) = 1) =$$

$$\frac{p(s_{01}(X_0) = 1 | X_0 = x \in [0,1]) \times p(X_0 = x \in [0,1])}{[p(s_{01}(X_0) = 1 | X_0 = x \in [0,1]) \times p(X_0 = x \in [0,1])] + [p(s_{01}(X_0) = 0 | X_0 = x \in [0,1]) \times p(X_0 = x \in [0,1])]}.$$

voter is displayed in Figure 1.

In CE games, there is a group of voters who, given K and the corresponding range of unprofitable alternatives implied by K, know that SQ is better for them *ex post* than any $s_{02}(X_0)$ a setter will propose. These voters are called "centrist" voters. Define *centrist voters* as $\{i \in N | T_i \in [\frac{SQ-\epsilon}{2}, \frac{SQ+\epsilon}{2}]\}$. Lemma 6 of Lupia (1990) states that "Vote for SQ" ($v_i = -1$) is a dominant strategy for all centrist voters. Figure 2 offers an example of where centrist voters might be located on a policy continuum.

Notice that non-centrist voters must choose between the certain utility provided by SQ and the expected utility of $s_{02}(X_0)$, where the expectation is taken with respect to the distribution of setter types $F(X_0)$. Since all voters have the same information about the setter's type and the location of $s_{02}(X_0)$, they do not condition their strategy on any specific setter type in the range of setter types that could potentially find contesting the election profitable $X_0 \in [0, SQ - \epsilon)$ or $X_0 \in (SQ + \epsilon, 999]$. In the CE equilibrium, $\forall X_0 \notin [SQ - \epsilon, SQ + \epsilon]$, $s_{01}(X_0)$ has the same value. All $X_0 \in [0, SQ - \epsilon), (SQ + \epsilon, 1]$ condition their choice of $s_{01}(X_0)$ on the number of voters in the set Z', where:

$$Z' = \{T_i \in [0, SQ - \frac{\epsilon}{2}), (SQ + \frac{\epsilon}{2}, 1] : \int_0^1 [U_i(X_0, T_i) f(X_0|1)] > U_i(SQ, T_i)\}.$$

Proposition CE:

The equilibrium for the CE game is:

$$\forall X_0 \in [SQ - \epsilon, SQ + \epsilon] \qquad s_{01}(X_0) = 0$$

$$\forall X_0 \in [0, SQ - \epsilon), (SQ + \epsilon, 1]: \quad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z'} g(T) dT > \frac{1}{2}: \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0: \qquad s_{02}(X_0) = X_0$$

$$\forall T_i \in [0, SQ - \tfrac{\epsilon}{2}), (SQ + \tfrac{\epsilon}{2}, 1]:$$

$$v_i(T_i, M(s_0, X_0)) = \begin{cases} 1 & \text{if } \int_0^1 [U_i(X_0, T_i) f(X_0|1)] > U_i(SQ, T_i) \\ & \text{and } M(s_{01}(X_0)) = 1 \\ -1 & \text{otherwise} \end{cases}$$

which implies:

$$\forall T_i \in (SQ - \tfrac{\epsilon}{2}, SQ + \tfrac{\epsilon}{2}): \qquad v_i(T_i, M(s_0, X_0)) = -1$$

Beliefs can be characterized by $f(X_0|1)$ or $f(X_0|0)) = Q(SQ)$,

depending on the value of $s_{01}(X_0)$.

Characteristics of the Equilibrium.

- The setter either contests the election and chooses his ideal point as $s_{02}(X_0)$ or accepts SQ. For $X_0 \in (SQ - \epsilon, SQ + \epsilon)$, entry is never profitable and we expect $ER_0 = 0$. For $X_0 \in [0, SQ - \epsilon)$ or $X_0 \in (SQ + \epsilon, 999]$ either $ER_0 = 1$ for all such setters or $ER_0 = 0$ for all.

- If a voter is not a "centrist", then the voting strategy is chosen to maximize *ex ante* expected utility.

- If the voter is a "centrist", expected utility maximizes *ex post* expected utility.

- The outcome is wholly independent of the choice of $s_{02}(X_0)$ the setter actually makes.

4.2.5 "Full Information" (FI) Game.

In the FI game, voters observe $s_{02}(X_0)$. This game is similar to the Romer and Rosenthal (1978, 1979) monopoly agenda setter game. Let $\bar{M} = [0, 999]$ be the space of FI game messages. $M(s_{02}(X_0)) = s_{02}(X_0)$ is the FI endorsement, which reveals the location of the alternative to voters. Let Z_{fi} be the set of voters that prefer the known alternative to SQ.

$$Z_{fi} = \{T_i \in [0,1] : [U_i(s_{02}(X_0), T_i) > U_i(SQ, T_i)]\}.$$

Let T_{MV} be the median voter's ideal point. We present the equilibrium for this game as Proposition FI (an interpretation of Romer and Rosenthal(1978, 1979).

Proposition FI:

The equilibrium for the FI game is:

$$\forall X_0 \in \chi_0 : \quad s_{01}(X_0) = \begin{cases} 1 & \text{if } \int_{Z_{fi}} g(T)dT > \frac{1}{2} \\ \\ 0 & \text{otherwise} \end{cases}$$

$$\forall X_0 \in \chi_0 : \quad s_{02}(X_0) = \max_{s_{02}(X_0) \in [0,1]} U_0(\cdot),$$

such that $U_{MV}(T_{MV}, X_0) > U_{MV}(T_{MV}, SQ)$.

$$\forall T_i \in \tau_i : \quad v_i(T_i, M(s_{02}(X_0))) = \begin{cases} 1 & \text{if } U_i(s_{02}(X_0), T_i) > U_i(SQ, T_i) \\ & \text{and } s_{01}(X_0) = 1 \\ -1 & \text{if } U_i(s_{02}(X_0), T_i) < U_i(SQ, T_i) \end{cases}$$

Beliefs can be characterized by $s_{02}(X_0)$.

Characteristics of the equilibrium.

- The setter contests the election and, from among those policies that the median voter prefers to SQ, he sets $s_{02}(X_0)$ to be the point he believes is the closest to his ideal.

- Voters vote for the policy that gives them the highest utility.

In equilibrium, setters choose $s_{02}(X_0)$ such that

$$s_{02}(X_0) \in [0, 999] = \max U_0(\cdot), \text{ such that } U_{MV}(T_{MV}, s_{02}(X_0)) > U_{MV}(T_{MV}, SQ).$$

That is, the setter chooses a point that the median voter prefers to SQ. If the setter's ideal point is in this class of alternatives, he can choose it and it will be the outcome. If the setter's ideal point is not in this class of alternatives, but if there exists a point that both the median voter and the setter prefer to SQ, then the setter selects the point that maximizes his utility and it is the outcome. If there exists no point that both the setter and the median voter prefer to SQ, then the SQ is the outcome.

4.2.6 The Events and Relationships that will Support the Theory.

In situations where voters have incomplete information about the location of $s_{02}(X_0)$, we may observe voters casting "mistaken" votes. The casting of such votes results in an increased likelihood that, in equilibrium, the *full information majority preferred alternative* (FIMPA) will lose. As the cost of contesting the election increases, the range of unprofitable alternatives widens, and the signal sent to voters as a result of setter entry provides the voters with better information about the location of $s_{02}(X_0)$. As voters learn more about the setter's actions, they are less likely to cast "mistaken" votes (i.e., we expect the size of the set of "mistaken" voters to decrease) and decisive sets of voters can pose a greater threat to setter's whose alternatives would not be the FIMPA. Better voter information, and a greater "electoral threat" will affect the determination of direct democracy outcomes. Our model provides us with a way to understand this affect and allows us to predict that the following events and relationships will be characteristics of our experiments:

1. If the setter's ideal point is within the "range of unprofitable alternatives," he should not enter. If the setter's ideal point is outside of this range, he should enter only if he expects to win the election.

2. The setter should always locate $s_{02}(X_0)$ at his ideal point in the NI and CE games. With an increased electoral threat, the setter should be increasingly willing to consider voter preferences when setting $s_{02}(X_0)$. Therefore, in the FI game, he should locate $s_{02}(X_0)$ at the point that both maximizes his utility and is preferred by the median voter to SQ, if such a point exists. (**The effect of information on the setter's strategy.**)

3. Setter entry costs act as a signal that provides voters with better information about the setter's actions. As a result, when $K > 0$, voters should be less likely to cast mistaken votes. When fewer "mistaken" votes are cast, the FIMPA is more likely to be the direct democracy outcome. (**The effect of information on voter strategies and direct democracy outcomes.**)

4. As a result of the setter's strategy and the effect of information on voter strategies, we should see that the outcome of direct democracy is closer to the median voter's ideal point when voters are fully informed and closer to the setter's ideal point when voters have incomplete information. (**Benefit to setter of superior information and value to voters of increasing political information.**)

5. Centrist voters should always vote for SQ.

4.3 Experimental Design.

These experiments were conducted at Caltech's Economics and Political Science Experimental Laboratory in March and April, 1990. All of the subjects were undergraduates at the California Institute of Technology. Subjects were paid cash for their participation in the experiment. The sequence of the experiment was as follows.

1. Voter and setter ideal points were determined using a uniform distribution and a random number generator. (The setter received one new ideal point each period. The voters received a new ideal point each session.)

2. A new value for SQ was selected for each series of ten elections (session).

3. Subjects were recruited through the use of posted notices, visits to student dining halls, and announcements in Political Science classes. No subject participated in more than one experiment.

4. Students reported to the laboratory and began the Instruction Session.[7]

5. Each subject was told to choose a non-transparent envelope from a group of similar looking envelopes. Each envelope contained an index card with either the word "Voter" or the word "Setter" on it. Only one card had the word "Setter" on it and the subject receiving that card was assigned the role of setter for the remainder of the experiment.

6. A graduate student assistant was assigned to keep records of the setter's action and to compute the setter's payoff.

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[7]The instructions given to the students are reprinted in Appendix B.1.

7. The setter and his or her assistant were seated in the same room as the voters, but in a separate aisle.[8] The assistant's job was to non-verbally notify the setter of his ideal points and payoffs by directing his attention to the setter information sheet.[9]

8. Five FI practice elections were held. At the conclusion of the fifth election a pre-experimental quiz was handed out. Subjects were given six minutes to complete the quiz.[10]

9. Subjects were then told the exchange rate for the experiment (1 $\pounds$ = \$ .008).

10. Payoff and information sheets were handed out to subjects.

11. The first experimental session began.

12. I gave all subjects the common knowledge information for the following session. In all of the sessions this included location of the status quo, the cost of contesting the election and the distribution from which voter and setter ideal points were drawn.

13. If the game type involved a positive cost of contesting the election, $K > 0$ (CE10, CE20), then subjects were told that for $s_{02}(X_0)$ located within a well defined neighborhood of SQ (100 units, 200 units), the setter would earn a lower payoff by contesting the election regardless of the election result.[11]

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[8]The Caltech experimental lab contains four rows of five terminals. Guler non-collusion devices are placed between all subjects to prevent any unplanned communication between subjects.

[9]This form is located in Appendix B.2.

[10]A copy of the quiz is located in Appendix B.2. The purpose of the quiz was to make sure that voters understood the information on their screens, the sequence of the game, their own role, the role of other subjects, the derivation of ideal points, and the determination of their payoffs. Voters were told at the beginning of the instruction session that they must pass the quiz in order to participate in the experiment. The assistant and myself corrected the quizzes and addressed any misinterpretation. No subjects failed the quiz.

[11]The exact text of this explanation is included in Appendix B.1.

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14. The setter was then given his private information (ideal point for the next period) by the assistant.

15. The computer prompted the setter to choose whether or not to contest the election.

16. If the setter decided not to contest the election, SQ was declared the outcome by the computer, the network did not give voters the opportunity to vote and the election period ended. (The setter's payoff is recorded by the assistant.)

17. If the setter contested the election, he had to pay the entry cost, which was either 0, 10 or 20 pounds.

18. The setter then selected an alternative in $[0, 999]$, and entered this choice into the computer.

19. In FI games, voters observed the location of $s_{02}(X_0)$; otherwise they did not.

20. Voters voted, the outcome was determined, and the next period began.

21. In Experiments 1-3, voters were told their payoffs and the aggregate election result after each period. In experiment 4, voters were told their payoffs at the end of each session and the aggregated election results were made available to them at the end of the experiment.

22. At the end of the fourth session, voters were asked to fill out the post-experiment questionnaire.[12]

23. Materials were collected, subjects were paid and the experiment ended.

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[12]The questionnaire was designed to find out educational characteristics of the subjects, and to have them describe how they made decisions, how they thought other players made decisions, and how their decision making changed during the experiment. A copy of the setter and voter questionnaires is included in Appendix B.2.

Four experiments were conducted, each consisting of four sessions. Each session consisted of 10 elections, where each election within a session was of the same type. Thus, each experiment consisted of 40 elections. The order of the game types in the four sessions was:[13]

1. Full Information (FI)

2. No Information (NI)

3. Costly Entry, $K = 10$ (CE10)

4. Costly Entry, $K = 20$ (CE20)

In order to isolate the effect of information and generate a sufficient variance in the information parameters, the following steps were taken:

1. Only one configuration of voter ideal points was used for all the sessions of all the experiments. The ideal points of the configuration were shuffled so that no voter received the same ideal point in any two sessions. The use of one configuration was revealed only to the setter. The voters knew the distribution from which the setter ideal points were drawn and knew that voters would receive a different ideal point each session.

2. We used the same set of 40 voter ideal points for each experiment. The ideal points were divided into four sets of 10 ideal points. The sets of ideal points were shuffled before each experiment. Thus, each set of 10 ideal points was used exactly once for

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[13]The sequence was chosen to minimize subject confusion. NI, CE10 and CE20 are equivalent games, which differ only in that the content of the signal provided by setter entry changes. An increasing cost of contesting the election is representative of a more informative signal.

each game type and no setter saw the same sequence of sets. No subjects knew that the same 40 ideal points were re-used across experiments.

3. Corresponding to each configuration of setter ideal points was a single SQ.

Figure 3 shows the parameters used in the experiment.

[FIGURE 3 HERE]

There exist important differences between the first three experiments (i.e., the first 30 elections of each of the four game types) and the fourth experiment (i.e., the last 10 elections of each game type). The remainder of this section describes the changes and their relevance.

Our model defines direct democracy as a non-repeated, one period, multi-stage game. The experiment has been designed to test for the effects of information in the direct democracy model. Unfortunately the cost, both logistically and financially, of bringing a different set of subjects for each election forced me to create a "single shot game" environment in a repeated game experimental setting.

The design of this experiment is similar to McKelvey and Ordeshook's (1984, 1985, 1986) attempts to show how two-candidate spatial models were affected by the introduction of incomplete information. Those experiments were designed to allow voters to use past information to estimate candidate actions. The desired result of that process was that the candidate's policy promises would, depending on the number of dimensions in the policy space, converge to either the median voter's ideal point or to a core determined by the configuration of voter ideal points.

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In a repeated game setting, however, subjects can learn from past actions. I wanted to create a non-repeated environment and attempted to minimize the amount that subjects could learn from the past by providing the setter with a "fluid" ideal point, or a new ideal point after each election. In order to allow the setter's preferences to be a source of uncertainty throughout the experiment, the setter's ideal point for each period was drawn, with replacement, from the common knowledge distribution of setter types, ($F(X_0)$ - uniform), using a random number generator. This method of determining the setter's ideal point was announced during the instruction session. The use of this method assured that past setter preferences could not serve as a signal of present or future setter preferences.

I originally believed that the implementation of the fluid ideal point would minimize any repeated play effects, but this belief turned out to be mistaken. In Experiments 1-3, subject-voters observed their own utility and past election results. This information provided subjects with information that voters in the model were not assumed to possess and allowed subject-voters to punish the setter for past actions. The fact that voters could employ a punishment strategy affected setter strategies - - setters became reluctant to choose alternatives that were near the endpoints of the continuum. This reluctance is documented in the responses to the "Setter Questionnaire" and Table 1a.

Table 1a. Effect of Setter Extremism on His Choice of $s_{02}(X_0)$

Experiments 1-3

FULL INFORMATION				II $= \{NI, CE_{10}, CE_{20}\}$	
Constant	- 41.50		Constant	- 3.90
SE	(46.32)		SE	(35.17)
Distance	**0.82**		Distance	**0.60**
SE	(0.16)		SE	(0.13)
r^2	.45		r^2	.22
N	30		N	68

Using data from experiments 1 -3, Table 1a reports two OLS regressions – one for the full information (FI) games and one for (II) incomplete information games - - since the relationship between the setter's ideal point and the location of the alternative should be the same within these game types but different across them. Specifically, in each case, the dependent variable is $|s_{02}(X_0) - X_0|$, the absolute value of the distance between the setter's ideal point and his choice of $s_{02}(X_0)$, and the independent variable is $|500 - X_0|$, the value of the distance between the setter's ideal point and the median of the (uniform) distribution from which voter types were drawn (500). A positive and significant coefficient indicates that the farther the distance between the setter's ideal point and the center of the distribution, the farther the setter's ideal point is from $s_{02}(X_0)$.

Table 1a shows that the farther away the setter's ideal point is from 500, the greater the distance between X_0 and $s_{02}(X_0)$. The model predicts that the coefficient of DISTANCE will be positive and significant in the FI elections, as this is reflective of the influence that voter preferences have on the setter's strategy. In contrast, the model predicts that the

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coefficient of DISTANCE will be zero in the II (Incomplete Information) elections. The coefficient of DISTANCE in the II regression (.60) is smaller than the coefficient in the FI elections (.87) but it is significantly larger than its predicted magnitude. This result is consistent with the supposition that relatively extreme setter types refrained from choosing extreme values for $s_{02}(X_0)$ in order to avoid future electoral punishment.

This behavior introduces some characteristics to the experiment that are not treated in the model. Hence, to make the experiment more consistent with the model, and to further minimize repeated play effects, one 4-session incomplete information experiment was conducted in which election outcome and individual payoff information was withheld from voters until the end of the experiment.

Table 1b shows the relationship between the relative extremism of the setter's ideal point and the distance between the setter's choice of alternative and his ideal in the fourth experiment. The regressions run in Table 2 are of the same type as those run for Table 1a. Notice that the coefficient of *Distance* in the II election regression is .07, which is close to and not significantly different from zero - - the value that our model predicts. The value of the distance coefficient for the FI elections is nearly the same for Experiment 4 (.79) as it was for Experiments 1-3 (.82) and is also positive, and significant, as our model predicted.

Table 1b. Effect of Setter Extremism on His Choice of $s_{02}(X_0)$

Experiment 4

FULL INFORMATION				INCOMPLETE INFORMATION		
Constant	- 43.47			Constant	- 10.83	
SE	(37.48)			SE	(13.12)	
Distance	0.79			Distance	0.07	
SE	(0.21)			SE	(0.05)	
r^2	.70			r^2	.18	
N	8			N	14	

Table 1b shows that the changes in the experimental design implemented in the fourth experiment acted to prevent voters from punishing the setter for past actions and setters from misinterpreting past election results. These changes, which made the experiment more representative of the electoral environment of the underlying model, as we show in the next section, improved the magnitudes of the hypothesized relationships to levels that the model would predict.[14] *Thus, where differences in setter risk aversion caused by the difference in voter information across experiments impacted the forthcoming analysis, I provide separate analyses for those experiments held before the changes and those experiments held after.*

One other design change was made during the course of the experiment, at the same time as the other changes, in order to make the experiment more consistent with the theory in Lupia (1990). To simulate the fact that direct democracy elections generally take place

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[14]Except in specific circumstances, which are noted, the changes in the experiment only seemed to have an impact on the setter's location decision. There were no significant differences in any of the other behaviors before and after the changes.

in large electorates, in Experiment 4 the setter was told the actual distribution of voter types. In Experiments 1-3, the setter only knew the underlying distribution (uniform over [0,999]) from which voter types were drawn.[15] This change should have only served to impact setter location decisions in the FI game (recall that the setter's equilibrium strategy is to choose the policy that is the closest to his ideal that the median voter prefers to SQ), and, in fact, was correlated with a slight change as will be explained in the analysis.

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[15]In all of the experiments, voters knew only the underlying distribution from which their types were drawn.

Table 2 - A Statistical Summary of the Experiment.

		FI	NI	CE10	CE20
A	Observations	40	40	40	40
B	Number of contested elections	38	38	27	17
C	Contested when $X_0 \notin [SQ - \epsilon, SQ + \epsilon]$	38/38	38/38	25/30	16/21
D	Contested when $X_0 \in [SQ - \epsilon, SQ + \epsilon]$	0/0	0/0	2/10	1/19
E	Statistic C, if win expected	38/38	38/38	25/30	11/16
F	Number of times that $X_0 = s_{02}(X_0)$, *Exp 1 - 3*	5/30	9/30	5/22	5/16
G	Number of times that $X_0 = s_{02}(X_0)$, *Exp 4*	3/8	8/8	4/5	1/1
H	Average $|s_{02}(X_0) - X_0|$, when $ER_0 = 1$, *Exp 1 - 3*	155	175	120.5	100
I	Average $|s_{02}(X_0) - X_0|$, when $ER_0 = 1$, *Exp 4*	82	0	20	0
J	Correct Centrist votes (ex post)	0/0	0/0	14/20	25/38
K	Correct Overall Votes (ex post)	233/246	164/246	117/177	95/112
	% Correct Votes	95	67	66	85
	Experiments 1 - 3	177/190	123/190	95/142	88/105
	%	93	65	67	84
	Experiment 4	56/56	41/56	22/35	7/7
	%	100	73	63	100
L	Number of times MFIPA = FI winner	36/39	22/40	30/40	38/39
	% MFIPA = Direct Democracy Outcome	92	55	75	97

With respect to the first hypothesis, we want to examine how the model predicts the setter's entry decision. Looking at rows C, D and E, we see that the model correctly predicted whether or not the setter would contest the election 142 of 160 (88.75%) of the time. This accuracy rate includes correct predictions 26 out of 29 times (89.65%) that the

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predicted whether or not the setter would contest the election 142 of 160 (88.75%) of the time. This accuracy rate includes correct predictions 26 out of 29 times (89.65%) that the setter's ideal point was located within the "range of unprofitable alternatives" and 116 out of 131 (88.55%) of the other cases.

Looking at these results in greater detail, recall that the model predicts that the setter will contest all elections in which the cost of contesting, k, equals zero. Thus, we should observe the setter entering the election every time in both the FI (Full Information) and NI (No Information Transmitted) games. Row B of Table 2 shows that the setter contested the election 38 out of 40 times (95%) in each type of game. On the two occasions where the setter did not contest the election in the FI game, the setter's optimal strategy, conditional on contesting the election, would have been to choose $s_{02}(X_0) = SQ$ - - so the setter was actually indifferent between entering and not entering. On the other hand, the two occasions where setters chose not to contest the election in NI elections appear to be mistakes. In each case, the setter, by not entering, selected a dominated strategy.[16]

Now consider the experiments for which $K > 0$. The model predicts that the setter will not contest the election if his ideal point is located within the "range of unprofitable alternatives." In the CE10 game, this range is the area on the policy dimension located within, and including, 100 units of SQ in both directions. In the CE20 game, this range is the area on the policy dimension located within, and including, 200 units of SQ in both directions. When a setter, whose ideal point is located within this range, contests the election, he has chosen a dominated strategy. Row D of Table 2 shows that this type of setter chose the dominated strategy "Contest the election," ($ER_0 = 1$) only 3 out of 29 times (10.35%). Row E of Table 2 shows that in 112 of 122 (91.8%) cases where, in

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[16]These mistakes cannot be linked to the repeated play-induced setter risk aversion pointed out in Section 4.3, as these mistakes occurred in the fourth experiment where past utilities were not revealed.

equilibrium, the "Setter Entry Rule" predicts that the setter should contest the election, he did. The setter entered 5 of 9 times when the setter was outside the "range of unprofitable alternatives" and "Setter Entry Rule" predicts that the setter does not enter.

Turning now to our second hypothesis, we want to show how the model predicts where the setter who enters chooses to locate $s_{02}(X_0)$. The analysis for this section is separated into two parts. Recall from Section 4.3 that to minimize repeated-play effects and to make the experiment more consistent with the theory, we altered several aspects of the experimental structure. The separated analysis allows us to analyze the experiment before and after the alteration. Specifically, in the first thirty elections (Experiments 1-3) of each type of incomplete information game ($II = \{NI, CE_{10}, CE_{20}\}$) voters learn past setter locations and their own resulting utilities. In the last 10 elections (Experiment 4) of each II game type, voters are not provided with utility and election result information until the end of the experiment.

In games of incomplete information, the model predicts (Lemma 2) that when the setter chooses to contest the election, he chooses his own ideal point as the location of the alternative ($X_0 = s_{02}(X_0)$). Row F of Table 2 shows that in Experiments 1 - 3 of each type of II game, the setter chose $X_0 = s_{02}(X_0)$ in 19 out of 68 (27.9%) cases.[17] This behavior is not consistent with the model's prediction (that the setter will enter 100% of the time), but is closer to this prediction than is the case for the corresponding FI games ($X_0 = s_{02}(X_0)$: in 5 of 30 cases, 16.7%).

On the other hand, the alterations in the experiment's design, implemented in Experiment 4, increased the model's predictive success. Row G of Table 2 shows that in 13 of the 14 (92.9%) times that the setter contested an incomplete information election after the

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[17]The setter chose to contst the election in 68 of 90 cases.

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change, he chose $X_0 = s_{02}(X_0)$. This is very close to the 100% that the model predicts.

With respect to our fourth hypothesis, the model predicts that the distance between the setter's ideal point and the location of the alternative will be less in the incomplete information elections than in the full information elections. In fact, the model predicts that this distance will be zero for the II case. Row H of Table 2 reports the average distance between the setter's ideal point and the location of the alternative for the first 30 elections of each type. Although the average distance for the II elections (140) is less than the average distance for the FI elections (155), the incomplete information average is far greater than the predicted value of zero. The difference between prediction and actualization can again be traced to the repeated play characteristics of Experiments 1 - 3. Row I of Table 2, on the other hand, shows the average distances for each type of election after making the changes in voter information (Experiment 4). For II elections, the average distance is 7.1 units, which is much closer to the prediction of 0 units and much lower than the distance in the corresponding FI elections (118.3).

Before proceeding with an evaluation of the remaining hypotheses, consider what we have learned by having, and then removing, aspects of the experiment that lend themselves to repeated play effects. Earlier (in Section 4.2.6), I referred to an "electoral threat," and argued that voters can achieve more favorable outcomes if they possess a credible electoral threat. The ability to punish setters for past actions gives voters such a threat, even though implementing the threat might be a dominated strategy, when viewing the election as an isolated event. Reducing voter information in Experiment 4, however, removes the possibility of punishment and results in setters locating $s_{02}(X_0)$ closer to their ideal points. This fact reinforces the central theme of the dissertation: Voters with more (less) information are able to obtain more (less) favorable direct democracy outcomes.

Turning now to the these hypotheses pertaining to voter behavior, we begin by examining the actions of "centrist" voters. Recall that centrist voters have ideal points located within a well-defined neighborhood of SQ, ($[\frac{SQ-\epsilon}{2}, \frac{SQ+\epsilon}{2}]$), and that the strategy "Vote for SQ" maximizes *ex post* expected utility. Row J of Table 2 shows that centrist voters chose SQ on 39 of 58 (67.2%) occasions. However, 17 of the 19 mistakes are due to two subjects who voted for SQ only 2 of the 19 times (10.5%).[18] The remaining centrist voters chose SQ 37 out of 39 (95%) times.

We now turn to the correspondence between the votes of non-centrist voters, and the votes that they would have cast if they were fully informed. The model predicts that as voters obtain more information they are more likely to choose the alternative that they would choose under conditions of full information (i.e., they become less likely to cast "mistaken" votes). Row K of Table 2 shows the number and percentage of correct votes cast in each type of election and shows the breakdown of this behavior before and after the changes in the experimental design. Notice that these differences are not significant for any experiment type[19] implying that, in general, the setter's fears of punish In FI

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[18] One centrist voter obviously drew the wrong implication from the information provided her. She voted against the alternative (SQ) that maximized her *ex ante* and *ex post* utility 12 of 13 (92.3%) times that she was a centrist. This same voter chose the correct *ex ante* vote 10 of 20 (5 of 10 in FI, 5 of 10 in NI) times in the elections in which she was not a centrist voter.

The other voter was evidently thrown off by "out of equilibrium" behavior by the setter. Notice, in Row D of Table 2, that the setter enters twice when his ideal point is in the "range of unprofitable alternatives." These two mistakes occurred in the same experimental session. This experimental session took place before the information changes were made. Thus the voter knew that the setter had earlier chosen a strategy that he should not have chosen. That the voter observed the setter's mistake obviously confused him. Before the setter made these mistakes, the voter voted for the SQ (1 of 1). After the setter made the mistakes, the setter voted for the $s_{02}(X_0)$ (5 of 5).

[19] That there is not a difference supports the supposition that the setters' fears of voters choosing punishment strategies, in Experiments 1-3, were unfounded.

elections, the model predicts that voters will cast "correct" (*ex post utility maximizing*) votes 100% of the time. In fact, 233 of 246 (95%) of the FI votes are correct. When voters have less information, the probability that a voter casts a correct vote should decrease. In the NI elections, where voters had the least information, 164 of 246 (66.7%) of the votes were cast correctly. When the cost of entry is increased from 0 to 10 pounds, the act of setter entry provides increased information to the voters about the location, and thus, the expected value of the alternative. Correspondingly, the model predicts that the probability of casting a correct vote will increase.

Contrary to this theoretical expectation, the probability in the CE10 game of a correct vote (66%, 117 of 177) was essentially the same as in the NI game (66.7 %). However, when the cost of entry was increased from 10 pounds to 20 pounds, the effect on voting behavior was significant: 95 of 112 (85%) votes were cast correctly in the CE20 game. The impact of information on voting behavior is clear: A relatively simple piece of information can provide a useful cue to incompletely informed voters.

Having examined the effect of information on setter and voter strategies, we can now evaluate the model's predictive power concerning the central theme of the dissertation: "When is the Full Information Majority Preferred Alternative (FIMPA) the direct democracy outcome?" I have stated, repeatedly, that the answer to this question depends on the amount of information possessed by voters. The model and the data from the experiment provide very strong support for such a statement.

Row L of Table 2 shows the number and percentage of times that the direct democracy outcome was the FIMPA. In the NI game, where voters possessed the least information, the FIMPA won the election 22 out of 40 (55%) times. In the CE10 game, voters possessed more information than they had in the NI game. In the CE10 game, the FIMPA won the

election 30 out of 40 (75%) times, a statistically significant increase. In the CE 20 game, the voters possessed even more information, and the FIMPA won 38 out of 39 (97%) times. This is not statistically different from the predicted (100%) or actual (92%, 36 out of 39) number of times that the FIMPA won in FI elections. *Thus, in the experiment, the knowledge that the setter must pay 20 pounds in order to contest the election acts as an effective substitute for full information.*
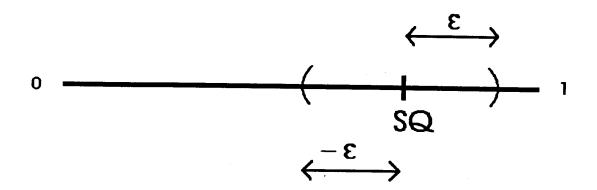
4.5 Conclusion.
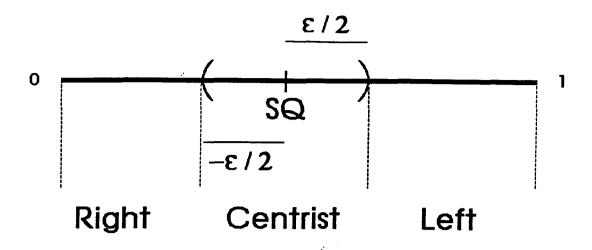
This chapter reports on the use of a laboratory experiment setting to test the predictions of the election models developed in Lupia (1990). The experiment was designed to examine the effect of "setter entry costs" on individual strategies and electoral outcomes, and to isolate the effect of information possessed by voters. In some elections, voters had full information about the location of SQ and $s_{02}(X_0)$. In other elections, voters knew the location of SQ, but were not told the location of $s_{02}(X_0)$. In this second set of elections, voters knew the cost of contesting the election faced by the setter and they could observe the setter's entry decision. Knowledge of the setter's entry decision and cost of entry is an effective signal to voters: If voters can witness the setter's entry decision where entry is costly, they are more likely to cast a vote identical to the vote they would cast if they had full information about SQ and $s_{02}(X_0)$. Moreover, as the cost of contesting the election increases, voters appear to learn more about the possible location of $s_{02}(X_0)$ and they are more likely to cast votes consistent with a full information scenario.

As a consequence of the way voter strategies are affected by information, the full information majority preferred alternative prevailed with increased probability as voter information increased. Thus, the relatively simple cue of costly entry can, as our model

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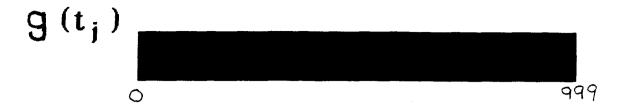
predicts, provide valuable information to otherwise uninformed voters. As to whether direct democracy is a useful mechanism for obtaining policy outcomes that correspond to the "will of the majority" or whether it is a tool of special interest groups that can be used to subvert the popular will, it is clear that direct democracy can be both. When voters possess relatively little information, minority groups that can set the agenda can use direct democracy to obtain preferred outcomes. When voters possess "enough," though not necessarily complete information then direct democracy is a useful tool for the implementation of majority-preferred policies.

4.6 Figures for Chapter 4.

FIGURE 1

FIGURE 2
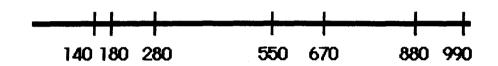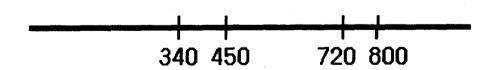
Uniform Distribution of Setter Ideal Points

$g \, (t_j)$

O   999

Distribution of voter ideal points.

140 180 280   550   670   880 990

Distribution of SQ's used.

340 450   720 800

FIGURE 3

Bibliography

[1] Black, Duncan (1958). *Theory of Committees and Elections.* Cambridge: Cambridge University Press.

[2] Downs, Anthony (1957). *An Economic Theory of Democracy.* New York: Harper and Row.

[3] Lupia, Arthur W. (1990). "Direct Democracy, Political Information and *The Will of the Majority*: A Spatial Model" California Institute of Technology Dissertation Chapter.

[4] McKelvey, Richard D. and Peter C. Ordeshook (1984). "Rational Expectations in Elections: Some Experimental Results Based on a Multidimensional Model" *Public Choice*, 44, 61 - 102.

[5] McKelvey, Richard D. and Peter C. Ordeshook (1985a). "Sequential Elections with Limited Information" *American Journal of Political Science*, 29, 480 - 512.

[6] McKelvey, Richard D. and Peter C. Ordeshook (1985b). "Elections with Limited Information: A Fulfilled Expectations Model Using Contemporaneous Poll and Endorsement Data as Information Sources" *Journal of Economic Theory*, 36, 55 - 85.

[7] McKelvey, Richard D. and Peter C. Ordeshook (1986). "Information, Electoral Equilibria and the Democratic Ideal" *The Journal of Politics*, 48, 909 - 937.

[8] Morton, Sanford (1988). "Strategic Voting in Repeated Referenda" *Social Choice and Welfare*, 5, 45 - 68.

[9] Popkin, Samuel, John W. Gorman, Charles Phillips, and Jeffrey A. Smith (1976). "Comment: What Have You Done for Me Lately? Toward An Investment Theory of Voting" *American Political Science Review*, 70, 779 - 805.

[10] Romer, Thomas and Howard Rosenthal (1978). "Political Resource Allocation, Controlled Agendas, and the Status Quo" *Public Choice*, Volume 33, 27 - 44.

[11] Romer, Thomas and Howard Rosenthal (1979a). "The Elusive Median Voter" *Journal of Public Economics*, Volume 7, 143 - 170.

[12] Romer, Thomas and Howard Rosenthal (1979b). "Bureaucrats vs. Voters: on the Political Economy of Resource Allocation by Direct Democracy" *Quarterly Journal of Economics*, 93, 563 - 587.

Appendix A

Appendix to Chapter 3.

A.1   Questionnaire.

CALIFORNIA INSTITUTE OF TECHNOLOGY

EXIT POLL   DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES 228-77   November 8, 1988

1. On today's ballot, there were five propositions dealing with the auto insurance industry.   YES   NO
   Did you vote on any of these propositions?

   (If NO, hand ballot card to voter and skip to Question 8.)

2. Did you use any aids in the voting booth, such as a ballot pamphlet or a newspaper to   YES   NO
   help you in voting on the insurance propositions? [If YES, ask respondent to specify.]

   Ballot pamphlet ____   Newspaper _____   Other (specify) _____

   I would now like to ask you how you voted on those propositions (tell voter that he/she may use aids in
   answering the next 5 questions).

   (HAND BALLOT CARD TO VOTER)

3. Proposition 100 — which reduces good driver rates and requires approval of   YES   NO   Did Not Vote
   insurance rate increases.

4. Proposition 101 — which reduces autombile insurance rates and limits the   YES   NO   Did Not Vote
   compensation given by insurance for four years.

5. Proposition 103 — which reduces auto insurance rates, requires an elected   YES   NO   Did Not Vote
   Insurance Commisioner's approval of rate increases and
   prohibits price-fixing and discrimination.

6. Proposition 104 — which establishes no-fault insurance for automobile   YES   NO   Did Not Vote
   accidents, reduces auto insurance rates for two years and
   restricts future regulation of the auto insurance industry.

7. Proposition 106 — which limits the amount of contingency fees which an   YES   NO   Did Not Vote
   attorney may collect in tort cases.

   I would now like to ask you some questions based on your recollections of these propositions. [Do not allow
   voter to use voting aids aside from the ballot card.]

8. What was your primary source of information on the auto insurance propositions?

   (DO NOT READ THIS LIST TO THE VOTER ! It is here for your convenience only)

TV or newspaper advertisements	_____	Ballot pamphlet from the state of California	_____
TV news broadcasts	_____	Info mailed by someone else	_____
Radio broadcasts	_____	Friends or relatives	_____
Newspaper articles/editorials	_____	Other _____	

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9. Which of the propositions do you believe were supported by the   100   101   103   104   106   DON'T KNOW
insurance industry?

10. Which of the propositions do you believe were supported by the   100   101   103   104   106   DON'T KNOW
trial lawyers?

11. Which of the propositions do you believe were supported by   100   101   103   104   106   DON'T KNOW
Ralph Nader?

POLLSTER: List alternatives on Questions 12–15.

12. Do you believe that Ralph Nader represents   CONSUMERS   INSURANCE CO.S   TRIAL LAWYERS   DON'T KNOW

13. Do you believe that the group called *Consumers*   CONSUMERS   INSURANCE CO.S   TRIAL LAWYERS   DON'T KNOW
for Lower Auto Insurance Rates represents

14. Do you believe that the group called *Voter*   CONSUMERS   INSURANCE CO.S   TRIAL LAWYERS   DON'T KNOW
Revolt to Cut Insurance Rates represents

15. Do you believe that the *California State*   CONSUMERS   INSURANCE CO.S   TRIAL LAWYERS   DON'T KNOW
Automobile Association (AAA) represents

16. Which proposition(s) establish a no-fault system of auto   100 101   103   104   106   DON'T KNOW
insurance?   Other_____

17. Which proposition(s) mandate giving discounts in insurance   100 101   103   104   106   DON'T KNOW
premiums to "good drivers"?   Other_____

18. Which proposition(s) limit attorney contingency fees?   100 101   103   104   106   DON'T KNOW
                                              Other_____

19. Which proposition(s) mandate(s) insurance rates which are not   100 101   103   104   106   DON'T KNOW
based on where you live?   Other_____

POLLSTER: List alternatives on Questions 20–23.

20. Which of the following favors the establishment of a   R. NADER   INSURANCE CO.S   TRIAL LAWYERS
no-fault system of auto insurance?   Other_____

21. Which of the following favors giving discounts in   R. NADER   INSURANCE CO.S   TRIAL LAWYERS
insurance premiums to "good drivers"?   Other_____

22. Which of the following favors limiting attorney   R. NADER   INSURANCE CO.S   TRIAL LAWYERS
contingency fees?   Other_____

23. Which of the following favors insurance rates which are   R. NADER   INSURANCE CO.S   TRIAL LAWYERS
not based on where you live?   Other_____

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24. What is the number of cars that your household's auto insurance   0   1   2   3   4   5   > 5
    policy covers ?

25. What is the make, model and year of the car that YOU drive?

    make_____   ·   model_____   year_____

26. Have you had any accidents or traffic violations in the last three years?   YES   NO

(TELL VOTER TO TURN OVER BALLOT CARD.)

27.–31. Please tell me the letter of the category which best answers the question.

27. What is your age?   A   B   C   D
    A. UNDER 25   B. 26–45   C. 46–65   D. OVER 65

28. Which category best describes your household's yearly auto insurance premium?   A   B   C   D   E   F
    A. < $500   B. $501 - $750   C. $751 - $1000   D. $1001 - 1500   E. $1501 - 2500   F. > $2500

29. Which category best describes your household's yearly income?   A   B   C   D   E
    A. < $15,000   B. $15,000 - $22,500   C. $22,500 - $40,000   D. $40,000 - $75,000   E. > $75,000

30. Which category best describes the highest level of education that you completed?   A   B   C   D   E
    A.Did not finish high school B.Finished high school C.Two years of college D.Four years of college E.More than four years of college

31. Which category best describes your racial or ethnic background?   A   B   C   D   E
    A. Asian   B. Black   C. Hispanic   D. White   E. Other

32. Are you married?   YES   NO

33. With which political party are you registered?   DEM   REP   Other

34. Sex of the voter   M   F

THANK THE VOTER FOR PARTICIPATING.

Remember to skip the next five voters, then interview the next person who is willing to participate.

A.2 A Theory-Based Explanation of Strategic Initiative Submittal.

The ballot initiative is an important decision-making institution in California politics. Legislatures and special interest groups have found the initiative process to their mutual interest in cases where an issue is highly salient, but too controversial for an office-seeking, contribution-needing legislator to act on. Recent issues meeting this description include gun control, offshore drilling rights and cigarette taxes, as well as insurance reform.

One increasingly common characteristic of initiative battles is their cost. It can be very expensive to support or fight a ballot initiative. In this case, the total expenditures by the three affected groups topped $82 million. In light of these costs, why was this particular initiative battle fought? I believe that the answer to this question has two components. First, the fact that one initiative was proposed ensured that multiple others would follow. Second, I believe that the affected groups underestimated the cost of fighting this particular battle.

To address the first point, suppose that one group has placed an initiative on the ballot. If you are a group who opposes this measure, you have several options. One option is not to fight the initiative.

By not fighting the initiative, you cannot affect the probability that it passes or fails. I assume that any effort you choose to expend would serve to decrease the probability that an unfavorable initiative wins. If the initiative passes, you may be worse off, but the overall decrease in your level of well being may not only be determined by this electoral outcome. Deciding not to contest the election not only affects the outcome of this election but also sends a signal to groups that would benefit by proposing an initiative that makes

themselves better off. By not contesting the election now, you signal to future rivals that the cost of an electoral battle is low relative to the cost of proposing an initiative that is opposed by a group that can affect the outcome of the election and will fight back. "Do not fight the initiative" is the strategy most likely to invite future unfavorable initiatives. This characterization of the strategic environment is a direct application of Selten (1978). If the expected loss from fighting back, now and in the future, is greater than the expected loss, now and in the future, of contesting the present initiative, you should fight the initiative.

A second option is to fight back. This may be expensive, but may be less costly than not fighting back for the reasons just cited. A third option is to fight the existing initiative and propose one of your own. This action may be expensive, but if you believe that the probability that your initiative can win the election is above some threshold probability, then you should choose this strategy. This strategy also increases the probability of agenda control, which from the work of Romer and Rosenthal (1978, 1979a, 1979b), we know to be a valuable asset. In the insurance reform case, the sequence of events implies that the qualification of the consumer activist initiative was the proximate cause of the qualification of the trial lawyer and insurance sponsored initiatives.

Estimating the present value of the discounted stream of returns to particular strategies would be an onerous task, and is not sufficiently close to the primary research agenda to attempt. Proceeding inductively, it appears that the strategy "Fight the other group's initiative and propose your own" was the strategy chosen by both the insurance industry and trial lawyers. Apparently, both groups expected that the returns to fighting an initiative would exceed the costs of doing so by some pre-determined margin.

A.3 Model with Issue and Interactive Variables.

Darkened, starred cell entries denote statistically significant coefficients. All INSURANCE coefficients are significant at the .05 level or better, except 104. which is significant at the .07 level. Other darkened, starred cell entries are significant at the .10 level, with none significant at the .05 level.

Table A Effect of Endorsements, Issues and Rate Determinants on the Vote

% YES on	100	101	103	104	106
Constant	-1.49	-2.52	-0.95	-0.96	-0.36
INSURANCE	1.38 *	-1.29 *	1.13 *	-0.65 *	-1.62 *
NADER	-	-	0.10	-	-
LAWYER	-0.49	-	-	-	0.53
VOTER REVOLT	-	-	0.43	-	-
AAA	-	-	-	-0.07	-
Limit Atty Fee	-	0.13	-	0.48	-
Geographic	-	-	0.07	-	-
Good Driver	1.49	-	0.83	-	-
Good / Violator	-0.69	-	-0.32	-	-
Violator	0.27	0.58	0.05	0.13	0.25
# of Cars	-0.10	-0.17	0.34 *	-0.24	-0.29 *
Republican	0.12	0.16	-0.12	0.49	0.56 *
N	223	225	234	225	229
log likelihood	-140.28	-70.02	-142.45	-114.82	-124.12
SVD	37.37	20.21	17.56	16.10	19.23

Table B First Differences: Increase in the Probability of a "YES" Vote.

	From	To	100	101	103	104	106
Constant							
INSURANCE	does not know	knows	32 *	-10 *	26 *	-11 *	-34 *
NADER	does not know	knows	-	-	6	-	-
LAWYER	does not know	knows	-12 *	-	-	-	12
VOTER REVOLT	does not know	knows	-	-	10	-	-
AAA	does not know	knows	-	-	-	-1	-
Limit Atty Fee	does not know	knows	-	1	-	9	-
Geographic	does not know	knows	-	-	3	-	-
Good Driver	does not know	knows	34	-	19	-	-
Good / Violator	No	Yes	-33	-	-7	-	-
Traffic Violator	No	Yes	8	4	1	2	7
# of Cars	1	2	-2	-1	8 *	-4	-8 *
Republican	No	Yes	3	1	-3	8	13 *

Appendix B

Appendix to Chapter 4.

B.1   Instructions.

This experiment is part of a study of elections. You will each be paid in cash for your participation in the experiment. The amount that you earn today will depend upon your decisions, the decisions of others, and chance. The payoffs in the experiment will not necessarily be fair, and we cannot guarantee that you will earn any specified amount. However, if you are careful, and make good decisions, you can generally expect to make a substantial amount of money.

This experiment consists of a series of elections. As you may be aware, some elections are contests between candidates for a legislative office, like mayor, senator or president. Other elections are, instead of contests among candidates, contests among different policy alternatives. In democratic countries, this type of election is used to make local, state and national policy decisions. It is this type of election that we intend to study with this experiment.

In the experiment, each of you will play one of two roles. Most of you will be voters. Each voter will be asked to vote for one of two policy alternatives, called the "Status Quo" and the "Alternative."

[Point to board.]

One among you will not be a voter and will, instead, be chosen, at random, to be a "policy setter." The "policy setter" will select the "Alternative." In this experiment, the policy receiving the most votes will determine everyone's payoff.

The experiment will take place through a network connecting the computer terminals. All interaction between you will take place through these terminals, and you are not allowed to communicate in any other way. If any difficulty arises, raise your hand, and one of us will come to assist you.

Before beginning the experiment, we will have an instruction session so that you can familiarize yourself with the terminals, the information they display, and with the sequence of events. After this session there will be a brief quiz. It is important that you pay close attention to the instructions, since you must pass the quiz in order to participate in the experiment. Any questions you have about the experiment should be addressed to me, and I will repeat the answer for everyone to hear.

We will now give each of you an envelope. A card inside the envelope will tell you your role in the experiment.

[ENVELOPES PASSED TO SUBJECTS]

Now that you all know your roles, we are ready to proceed with the instruction session. Will the "policy setter" please sit at the terminal to my left, and will the voters please sit at the terminals in the center of the room.

The setter will have an assistant who is not a participant in the election. The assistant's job is to record all of the setter's actions and payoffs. The computer records all voter actions.

You may turn your terminal on now by pressing the key labeled "master", which is located directly beneath the screen. When the terminal asks for your name, please type in your name, then hit "Enter."

[SUBJECTS ENTER THEIR NAMES and WAIT FOR GAME SCREEN TO APPEAR]

Voter and setter screens are different, but have some similarities. The top part of all screens keeps a record of what has happened previously, while the bottom part tells you what is happening now. The first column on all of the screens is labeled ELECT and tells you which election in the experiment you are in. It is currently election Number 1, thus, it is time to hold our first practice election.

Each experiment consists of a series of elections. The purpose of each election is to choose a certain policy. The policy that wins the election directly determines all of your payoffs. How the winning policy determines your payoffs will be explained shortly.

Voters will be asked to vote for one of two policy alternatives. One of these policies will be selected by the setter. By making two decisions, the setter determines the choices that voters will have in each election. The setter's first decision is whether or not to contest the election.

Later, in the actual experiment, the setter will make this decision on his own. For now, the setter should enter the response "YES" to the question, "Do you wish to contest the election ?" To make this response, type in "YES," then press "Enter"

Since the setter has chosen to contest the election he must now select a policy that voters can vote for. The policy, which the setter selects, is called the "alternative". The ALT is represented by a point on the line which begins at 0 and ends at 999. Later in the experiment, the setter will choose the location of the alternative on his/her own. For now, the setter should choose the ALT to be the point 650 on the line that begins at 0 and ends at 999.

Setter, to take this action, type in 650, then press "Enter." The setter will be asked to confirm his/her decision and can do so by typing "Y," and then "enter." If the setter makes a mistake in typing in their decision, they can correct it by typing "N" and starting over.

[Setter chooses the ALT]

Now appearing on the bottom of player screens is the location of the ALT, which is listed as "ALT's position." Verify that the ALT is located at the point 650.

[Verification.]

Also appearing on the bottom of your screen is the position of the other policy that you can vote for, the SQ. The SQ, like the ALT, is represented by a point on the line which begins at 0 and ends at 999. Appearing on the bottom of player screens is the location of the SQ, that is listed as "SQ's position." Verify that the SQ is located at the point 400.

[Verification.]

The SQ for each election has been determined by the experimenters before the beginning of the experiment and all actions on behalf of the SQ are performed automatically by the computer. The SQ will remain the same for each of the upcoming experimental sessions. The location of the SQ will be announced at the beginning of each experimental

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session and will always be posted on the board, in addition to appearing on your screens.

Voters can now move the two policy position from the bottom of their screens to the top of their screens by pressing "Enter." As you can see, the SQ is now located in the column labelled "SQ's position," while the ALT is in its appropriate column.

Voters, when I instruct you, please vote in Election 1. To vote for the SQ, type "capital S," then hit "Enter." To vote for the alternative, type "capital A," then hit enter. Please vote for the ALT in Election 1 now by entering a "capital A" at your terminal. Please wait for further instructions before doing anything else.

As you can see, the ALT has won the election, because a majority of you voted for that policy. To see the election result, look in the last column, which is labeled "Vote". This column shows the vote for SQ, followed by the vote for A. You can see that the SQ received no votes and the ALT received seven votes.

Note that the setter and the voters both receive the same information about the election result. This is important to realize since it implies that no participant in the experiment can ever learn how any other participant voted. All that any participant ever learns about the election is the aggregated result.

Setter, you can check your payoff from the last election by looking at the column labelled "Income" on the your setter information sheet, which has been filled out by the assistant. Since the ALT won the election, the setter will see that he has earned 98 pounds.

Voters can verify that they have earned 85 pounds each by looking under the column labelled "Income" on their screens. Voter income is recorded by the computer, and a voter's cumulative income in the experiment is displayed in the bottom right hand corner of their computer screen in blue. All players should be aware that 100 pounds is the

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maximum payoff, and 0 the minimum payoff, that any player can receive in one election period. These pounds can be exchanged for dollars at the end of the experiment at a fixed exchange rate.

At this point you are undoubtedly curious about how your income was determined. Let me start this explanation by telling you that each of you has an "ideal point" on the line that begins at 0 and ends at 999. Voters, your ideal points are located in the bottom left-hand corner of your screens and are in white. The setter's ideal point is located in the column labelled "Ideal Point" on your Setter Information Sheet. Please take a moment to look at your ideal point.

[Players look at their ideal points.]

If your ideal point is the same as the winning policy, you receive the highest possible payoff for that period, which is 100 pounds. The further your ideal point is from the winning policy the lower your payoff will be. In this practice session, all voters have the same ideal point, which is 500. In the real experiment, each voter will have a different ideal point.

If the winning policy of the first practice election had been located at 500, the voter ideal point, voters would have received the maximum payoff of 100 pounds. However, the winning policy, the ALT, was located at the point 650. This point is 150 units away from the voter ideal point. As a consequence, each voter received 15 pounds less than 100, or 85 pounds. If the winning policy was 200 units away from your ideal point in either direction (either 300 or 700), you would receive a payoff of 80 pounds. Consequently, since the SQ is 100 units away from your ideal points, then if SQ had won the election, your payoff would have been 90 pounds.

[Show the following example on the board.]

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The setter's income for this period was 98 pounds. The setter's payoff is not on his screen but is tabulated for him by the assistant. The setter's payoff is computed in exactly the same way as the voter payoffs. The setter's income was 98 pounds because the setter's ideal point was 20 units away from his ideal point. That is, the location of the winning policy 650, was 20 units away from the setter's ideal point, which was 630. Had the SQ won the election, the setter's payoff would have been 77 pounds since the SQ is 230 units from the setter's ideal point.

In the real experiment each participant will have his/her own unique ideal point, and only you will know what your own ideal point is. Throughout the experiment, your payoffs will be computed in the manner that I have just demonstrated. Are there any questions about how your payoffs are determined?

[Questions.]

Good, now let's proceed to practice election number 2.

Recall that in each election period the setter's decisions determine the choices that voters will have in the upcoming election. In the first election period, voters were given a choice between the SQ located at the point 400, and the ALT, which was chosen by the setter and located at the point 650. By making different decisions, the setter can change the choices that the voters will have in Election number 2.

First, the setter decides whether or not to contest the election.

Later, in the actual experiment, the setter will make this decision on his own. For now, the setter should enter the response "NO" to the question, "Do you wish to contest the election ?" To make this response, type in "N" then press "Enter."

[Setter Chooses not to Contest the Election.]

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Since the setter has chosen not to contest the election, he does not get to choose the "alternative". When the setter decides not to contest the election, voters do not have an opportunity to vote, and, the SQ wins the election by default. Note that the setter always has the option not to contest the election.

The setter can again check his/her payoff in the last election by looking at the column labelled "Income" on the setter information sheet. Since the SQ won the election, the setter will see that he has earned 77 pounds. Voters will see that they have earned 90 pounds each.

[SUBJECTS LOOK AT SCREEN]

Now, we will proceed to practice election number 3.

There will be two differences between the next three practice elections and the last two. The first difference is that the setter and voters will be allowed to make their own decisions. The second difference has to do with the setter's ideal point.

From now until the end of the experiment, the setter will receive a new ideal point each period. This is different than the voters, who will always keep their same ideal point for an entire experimental session. The assistant will show the setter a new ideal point each period and only the setter and his/her assistant will know the exact location of his ideal point in any particular period. While this implies that voters will not know the exact location of the setter's ideal point, voters will know something about it. Voters will know that the setter's ideal point is drawn each period from a discrete uniform distribution.

In less technical terms, the setter's ideal point is equally likely to be any point between and including 0 and 999. So in each period there is a 1 in 1000 chance that the setter's ideal point is 174, (repeat) 372, 819. The setter's ideal points for the remainder of the

experiment were obtained through the use of a random number generator. So it is very unlikely that the setter's ideal points will follow any particular pattern and it is not the case that a setter's past ideal points in any way determine his/her future ideal points.

In other words, just remember that at any time during the experiment, the setter's ideal point is equally likely to be any number between and including 0 and 999 and that the setter's payoff depends on the difference between his ideal point and the winning policy. Note that the setter neither gains an increased payoff from winning the election nor receives a lower payoff for losing the election, the setter receives utility only from the distance between the winning policy and his ideal point, just like the voters.

Are there any questions about ideal points ?

[Questions]

Remember that the voters keep their same ideal points and the SQ remains the same. Let us now proceed with the third practice experiment. Please do not enter your choice into the computer until you are told by me to do so. The setter should be aware of the fact that the computer will only accept your first response to this question. Will the setter now decide whether or not to contest the election.

[Setter makes entry decision.]

If NO. The setter has chosen not to contest the election. Therefore, the SQ wins by default. Voters each receive a payoff of 90 units, as the SQ is 100 units from their ideal points. The setter receives a payoff of 51.4 pounds, as the SQ is 486 units from his new ideal point, 886. Will all players please press enter to move the election result to the top part of their screens. Let us now proceed with the fourth practice election.

If YES. The setter has chosen to contest the election. As a result, he must now choose

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the value of the ALT. Will the setter please enter a value for the ALT.

[Setter chooses ALT]

Will voters now vote for either the SQ or the ALT.

[Voters vote.]

As you can see by looking in the column labelled "Vote" on your screen, the policy (Winner) has won the election. Since the winning policy was (D) units away from your ideal points, your payoff for this election period should be 100 - D.

If SQ wins.

The setter receives a payoff of 51.4 pounds, as the SQ is 486 units from his new ideal point, 886. Will all players please press enter to move the election result to the top part of their screens. Let us now proceed with the fourth practice election.

If ALT wins.

The setter receives a payoff of ZZZ pounds, as the SQ is ZZZ units from his new ideal point, 886.

In the fourth and fifth elections, voter ideal points and the SQ will remain as they were. The setter's ideal point will change each period. Will the setter and the voters please proceed with the fourth and fifth practice elections. At the end of the fifth election, please do not touch your keyboard until you are instructed to do so

[Fourth and Fifth practice periods.]

[SQ, ALT] is the policy that has won the fifth practice election. This completes the instruction session.

At this point, voters can check their screens to verify that they have accumulated a total of 5v pounds in income. The setter can check his information sheet to verify that he has collected 5s pounds in income through the five practice experiments. In a real experiment, this total would represent your total earnings for the first five election periods, and at the end of the experiment would be converted to dollars at the pre-specified exchange rate.

The Quiz:

It is now time for a brief quiz. Please do not touch your terminal until I tell you to. It will be necessary for you to pass this quiz in order to participate in the experiment. The quiz is on things that we have already discussed. If you have any questions about the content of your screen or the structure of the experiment, please ask them now. Will the experimenters please hand out the quizzes.

[EXPERIMENTERS HAND OUT QUIZZES]

When you complete the quiz, please raise your hand and one of us will correct the exam for you. You have six minutes to complete this quiz, please begin now.

[SUBJECTS ANSWER QUIZ, we correct them with the individual]

There will be four sequences of elections and each sequence will contain 10 elections. Before each sequence you will be notified about all differences between the sequence of elections that you have just completed and the sequence which you are about to begin. The sequences will only differ in the following ways:

1. In each session every voter will receive a new ideal point that they will retain for the next ten periods. Different voters will have different ideal points. So, unlike in the instruction session, for a given winning policy all voters will receive different incomes. In addition, the setter will know the distribution of voter ideal points, but

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will not know the ideal point of any particular voter.

2. In each session the setter receives ten new ideal points, drawn from the same uniform distribution as has already been explained.

3. The information that voters receive about the setter's actions will change. This will be explained in greater detail at that time.

After the four sessions have been completed, the experiment will end and subjects will be paid on the basis of the earnings they have accrued. To compute your total payment, add the pounds that you have earned from each of the four sessions, and multiply by the exchange rate, which is (.008) and will be listed on your record sheet. Enter this amount in the final column of your record sheet, and submit it to the experimenter to receive your payment.

Are there any questions?

We are now ready to begin the real experiment.

This session will be exactly like the last three elections of the practice session except that all voters will receive new and unique ideal points and the setter will receive a new set of 10 ideal points. The status quo for this session is _____. When instructed, please begin the experiment. Since your actions will help to determine your payoffs, be sure to consider all of your choices carefully. You may now begin the first experiment.

[FIRST EXPERIMENT]

The first series of elections is complete. Voters, record your cumulative payoffs on your record sheet. The setter's payoff will be recorded by the assistant.

[Check that written payoffs match with screen payoffs.]

We are now ready to begin the second experiment.

B.1.1   No Information Game.

This series of elections differs from the last in two ways. First, voters will each receive a new and unique ideal point and the setter will receive a new set of ten ideal points. Second, voters will not be told the location of the ALT. However, voters will always know the location of the SQ. Third, voters will not be told their utility after each period. Instead voters will be asked to keep track of the winners of the election on the "Voter Information Sheet" that they should now have. At the beginning of each session the voters should fill out the top of the voter information sheet. After each election the voters should enter the identity of the election winner. After the fourth session, one of the experimenters will tell you the location of the winning policy and then you can figure out your payoff for the session. Voters, please enter the following information on your information sheet. The status quo for this session is 340. The cost of contesting the election is zero to the setter. Your ideal point will appear shortly on your screen. When instructed, please begin the experiment. Since your actions will help to determine your payoffs, be sure to consider all of your choices carefully. You may now begin the second experiment.

[SECOND EXPERIMENT]

The second series of elections is complete. We are now ready to begin the third experiment.

B.1.2 Costly Entry Game - 1.

This experiment differs from the last in two ways. First, all voters will receive new ideal points and the setter will receive a new set of ten ideal points. Second, it will now cost the setter 10 pounds, instead of 0 pounds, in order to contest the election.

[Show the following example using a diagram and equations.]

This implies that if the setter chooses the ALT to be within 100 units of the SQ in either direction, he will receive less utility from winning the election than he will if he accepts the SQ. The setter is free to choose the ALT to be whatever he likes.

[EXAMPLE 500, 550]

If he chooses the ALT to be more than 100 units away from the SQ, he will get a higher payoff if he wins.

[EXAMPLE 500, 650]

In each of the next ten periods the setter can decide to accept the utility from the SQ, at no cost, or pay 10 pounds for the privilege of suggesting the alternative. The cost of entry for this experiment will always be displayed on the information board, directly below the SQ for this session.

Are there any questions about this experiment? Voters, please enter the following information on your information sheet. The status quo for this session is 800. The cost to the setter of contesting the election is 10, and your ideal point will appear shortly on your screen. When instructed, please begin the experiment. Since your actions will help to determine your payoffs, be sure to consider all of your choices carefully. You may now begin the third experiment.

[THIRD EXPERIMENT]

The third series of elections is complete.

B.1.3   Costly Entry Game - 2.

This experiment differs from the last in two ways. First, all voters will receive new ideal points and the setter will receive a new set of ten ideal points. Second, it will now cost the setter 20 pounds, instead of 10, in order to contest the election.

[Show the following example using a diagram and equations.]

This implies that if the setter chooses the ALT to be within 200 units of the SQ in either direction, he will receive less utility from winning the election than he will if he accepts the SQ.

[EXAMPLE 500, 650]

If he chooses the ALT to be more than 200 units away from the SQ, he will get a higher payoff if he wins.

[EXAMPLE 500, 750]

In each of the next ten periods the setter can decide to accept the utility from the SQ, at no cost, or pay 20 pounds for the privilege of suggesting the alternative. The cost of entry for this experiment will always be displayed on the information board, directly below the SQ for this session.

Are there any questions about this experiment? Voters, please enter the following information on your information sheet. The status quo for this session is 450. The cost to the setter of contesting the election is 20, and your ideal point will appear shortly on

your screen. When instructed, please begin the experiment. Since your actions will help to determine your payoffs, be sure to consider all of your choices carefully. You may now begin the fourth experiment.

[FOURTH EXPERIMENT]

The fourth series of elections is complete.

B.1.4 End.

The experiment is now complete. In order to compute your payoffs, you will need the outcome sheet that we are passing around. To compute your earnings from the experiment, total your payoffs from each of the four experimental sessions and multiply by the exchange rate that is on the bottom of your screen. While we are recording the experimental data, we would like you to fill out a post-experimental questionnaire. Please respond to each of the questions carefully. In a few moments, we will call each of you individually to collect your payoff sheets and questionnaires. At that time we will pay you and you are free to go. Thanks again for your participation in this experiment.

B.2 Selected Forms.

VOTER QUIZ

1. If the setter's ideal point last period was 400, which of the following events is most likely this period ?

    a.   The setter's ideal point is 400.

    b.   The setter's ideal point is less than 400.

    c.   The setter's ideal point is greater than 400.

    d.   The setter's ideal point is equally likely to be any point between 0 and 999.

    e.   All of the above answers are equally likely.

2. If your ideal point last period was 400, which of the following events is most likely this period ?

    a.   Your ideal point is 400.

    b.   Your ideal point is less than 400.

    c.   Your ideal point is greater than 400.

    d.   Your ideal point is equally likely to be any point between 0 and 999.

    e.   All of the above answers are equally likely.

3. If the setter's ideal point is 300, the Status Quo (SQ) is 503, and the setter's payoff was 95, which of the following could have occurred ?

    a.   The alternative was located at 250 or 350 and WON.

    b.   The alternative was located at 250 or 350 and LOST.

    c.   The alternative was located at 295 or 305 and WON.

    d.   The alternative was located at 295 or 305 and LOST.

    e.   All of the above.

4. If your ideal point is 600, the Status Quo (SQ) is 534, and the your payoff was 56, which of the following could have occurred ?

    a.   The alternative was located at 160 and WON.

    b.   The alternative was located at 160 and LOST.

    c.   The alternative was located at 1040 and WON.

    d.   The alternative was located at 999 and WON.

    e.   All of the above.

5. In practice election # 4

    a.   What was the location of the Status Quo ? _____

    b.   Was the election contested ? _____

    c.   What was your ideal point ? _____

    d.   Which policy won election # 4 ? _____

    e.   What was your income, in pounds, from election # 4 ? _____

6. What was your income, in pounds, from the 5 practice elections ?

Session #	Cumulative Income (in Pounds)	Exchange Rate	Total Payoff
INSTRUCTION	£	(× .008)	$

SETTER QUIZ

1. If your ideal point last period was 400, which of the following events is most likely this period ?
  a. Your ideal point is 400.
  b. Your ideal point is less than 400.
  c. Your ideal point is greater than 400.
  d. Your ideal point is equally likely to be any point between 0 and 999.
  e. All of the above answers are equally likely.

2. If a voter's ideal point last period was 400, which of the following events is most likely this period ?
  a. The voter's ideal point is 400.
  b. The voter's ideal point is less than 400.
  c. The voter's ideal point is greater than 400.
  d. The voter's ideal point is equally likely to be any point between 0 and 999.
  e. All of the above answers are equally likely.

3. If your ideal point is 300, the Status Quo (SQ) is 505, and your payoff was 95, which of the following could have occurred ?
  a. The alternative was located at 295 or 305 and WON.
  b. The alternative was located at 295 or 305 and LOST.
  c. The alternative was located at 250 or 350 and WON.
  d. The alternative was located at 250 or 350 and LOST.
  e. All of the above.

4. If a voter's ideal point is 600, the Status Quo (SQ) is 527, and the voter's payoff was 56, which of the following could have occurred ?
  a. The alternative was located at 160 and WON.
  b. The alternative was located at 160 and LOST.
  c. The alternative was located at 1040 and WON.
  d. The alternative was located at 999 and WON.
  e. All of the above.

5. In practice election # 4
  a. What was the location of the Status Quo ? _____
  b. Was the election contested ? _____
  c. What was the location of the alternative? _____
  d. What was your ideal point ? _____
  e. Which policy won election # 4 ? _____
  f. What was your income, in pounds, this period ? _____

6. What was your income, in pounds, from the 5 practice elections ?

Session #	Cumulative Income (in Pounds)	Exchange Rate	Total Payoff
INSTRUCTION	£	(× .008)	$

VOTER QUESTIONNAIRE

Name _____   Date_____

1. *Classification (circle one):* Freshman Sophomore Junior Senior

2. *PS 12 (circle one):* passed the class taking the class never enrolled other

3. *EC 11 (circle one): passed the class taking the class never enrolled other*

4. *How do you think the setter made his/her decisions ?*

5. *How did you decide which policy to vote for ?*

6. *Did the way you made this decision change during the experiment ? If so, how?*

7. *How do you think that your actions affected your payoff ?*

8. *How did not knowing the location of the alternative affect your decision making ?*

9. *Describe how the knowledge that the setter had to pay to contest the election affected your decisions ?*

(NOTE: Form given to subjects had more room for responses.)

SETTER QUESTIONNAIRE

Name _____   Date_____

1. Classification (circle one): Freshman Sophomore Junior Senior

2. PS 12 (circle one): passed the class taking the class never enrolled other

3. EC 11 (circle one): passed the class taking the class never enrolled other

4. How did you make your decision on whether or not to contest the election ?

5. Did the way you made this decision change during the experiment ? If so, how?

6. How did you decide where to locate the alternative when you did contest the election ?

7. Did the way you made this decision change during the experiment ? If so, how ?

8. How do you think voters made their decisions ?

9. Describe how the introduction of a cost for contesting the election affected your decisions.

(NOTE: Form given to subjects had more room for responses.)

Name of setter _____

Date _____Experiment # _____Session _____

Status Quo = 720

Period	Ideal Point	Cost	ENTRY	POSITION	Outcome	Payoff
1	344	0				
2	898	0				
3	813	0				
4	368	0				
5	220	0				
6	554	0				
7	663	0				
8	249	0				
9	698	0				
10	471	0				
TOT						

Setter's Signature _____Date _____

Assistant's Signature _____Date _____