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STRATEGIC BEHAVIOR IN SINGLE ISSUE COLLECTIVE CHOICE SETTINGS
AN EXPERIMENTAL ANALYSIS WITH APPLICATION TO MILLAGE ISSUE ELECTIONS

BY

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ABSTRACT

STRATEGIC BEHAVIOR IN SINGLE ISSUE COLLECTIVE CHOICE SETTINGS: AN EXPERIMENTAL ANALYSIS WITH APPLICATIONS TO MILLAGE ISSUE ELECTIONS

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Early formal models of collective choice were explicitly unidimensional (i.e., concerned with a single issue). Later analysis has shown that the initial success of these models depended essentially upon their unidimensional form and that this form was not appropriate to most collective choice settings. One exception is the use of public referenda to set local tax rates for the provision of public education. Given this, much ink has been shed by scholars of economics and political science in an effort to test empirically notions derived from formal modeling in this environment. The results of these efforts have been largely inconclusive. This dissertation argues that much of this work has been misdirected and that a primary failure has been the inappropriate specification of certain crucial variables within these models. Experimental designs are used to isolate key factors such as the relationship between turnout and intensity of preference, relative levels of sophistication on the part of key actors within the environment, and the effects of different institutional constraints on participant interaction. The data derived from these experiments are analyzed using Probit and

analysis of variance techniques. The respecified variables are then applied in a case study of a recent millage election in a Michigan school district.

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INTRODUCTION

> "All the matters about which science speaks, whatever the science be, are abstract, and abstract things are always clear. So that the clarity of science is not so much in the heads of scientists as in the matters of which they speak. What is really confused, intricate, is the concrete vital reality, always a unique thing. The man who is capable of steering a clear course through it, who can perceive under the chaos presented by every vital situation the hidden anatomy of the movement, the man, in a word, who does not lose himself in life, this is the man with a really clear head."-Jose Ortega y Gasset

This dissertation is an experimental analysis of certain formal models and hypotheses concerning single issue collective choice situations. The modifier `formal' has a precise meaning here. By `formal' I mean that these structures are derived from an axiomatic base by virtue of a `first-order predicate calculus with equality', or, in less grandiose terms, they are grounded in logical or mathematical principles rather than empirical experience. This condition of formalism in scientific practice was initially specified by the `Vienna Circle' at the birth of the logical-positivist philosophy of science. Even in so doing, the `founding fathers' of logical-positivism reserved the determination of the meaningfulness of such structures to observational reference. The working out of that connection between the formal and the empirical has been the fundamental problem for philosophy of science ever since. I am certainly not proposing to solve this problem in this dissertation. However, what I do propose has a very real claim to a piece of that problem; at least with respect to the practice of political science.

Formal modeling in political science is still a fairly recent phenomenon. It is hard to fix a date for its beginning. Still, whether

we choose Arrow [1963], Black [1958], Downs [1957], or some other auspicious point, certain characteristics stand out in most of the candidates. Notably, all of the authors just mentioned are trained as economists rather than political scientists. The theoretical orientation of their models, understandably, reflects concerns borrowed from microeconomics (e.g., equilibria and efficiency). What makes their models `political' is the subject matter to which they are applied. The universe of discourse is the public choice setting rather than the private market. The translation of microeconomic principles and designs to this environment has been anything but smooth.

The branch of political science most concerned with formal modeling often goes by the nom de plume of `positive theory'. Given that the major results published under this heading are profoundly `negative', a more ironic title is hard to imagine. As Aldrich and Ostrom [1980:870] put it:

> "Perhaps the single most important goal for anyone interested in the substance of the [formal modeling] enterprise is the search for the nonobvious conclusion. In political science, the search for the nonobvious has often revealed not just the surprising discovery, but the paradoxical, the anomalous -indeed, even the ethically and philosophically disturbing."

The paradoxical situations confronted by formal modelers in political science are almost always two-sided. On the one hand, structures which, by virtue of their roots in microeconomic theory, champion equilibrium and efficiency end up predicting disequilibria and inefficiency. On the other hand, these dire predictions are seldom borne out empirically -at least not to the extent that might be

expected from the models. This double-bind has led some commentators to dismiss the entire enterprise of formal modeling as irrelevant to the concerns of political science. While such an assessment seems rather extreme, it cannot be denied that this is a curious state of affairs indeed.

However tempting it may be simply to say that economics are economics and politics are politics and `never the twain shall meet´, this ignores the real issue of formalism. Certainly, political questions require political answers. Still, to accept this does not carry with it a necessary rejection of formal modeling. The canons of logic and mathematics are the same for both political scientists and economists. The `truth´ of formal models is a definitional truth, and is, therefore, not subject to empirical refutation. Thus, the source of paradox does not lie in the practice of formalism itself.

If political scientists have erred in borrowing the techniques of formal modeling -and I am not altogether sure that they have - perhaps the source of that error is given in the fact that with these techniques they have also borrowed the values and expectations of economics. The desire for market optimality and equilibrium is valuable, but it should not be allowed to supplant the fundamental questions which undergird the discipline of political science and distinguish it from other disciplines. These questions harken back, in various forms, to Lasswell´s notion that politics is the science of `who gets what, when and how´. We, as political scientists, should not apologize for our own disciplinary orientation to these issues, nor should we seek to be anything other than what we are. To be a political scientist involves a concern for `who´ benefits from the

political process and `how' they achieve their benefits. Economists may be content to regard the outcomes of public choice as anonymous mathematical artifacts to be evaluated in terms of their mathematical properties, we cannot do so.

Viewed from this perspective, the exposition of apparent paradox has a certain heuristic utility. When formal models demonstrate that `market-like' equilibria and optimality are rarely reproduced in the public choice setting the lesson to be learned from this is found in the examination of the institutional differences between the two environments. Rather than rejecting the entire enterprise of formalism, we reject the exclusive reliance on those standards and assumptions of microeconomics which are specific to market exchange. In so doing, we not only acknowledge that political environments are somehow different from the private market, we further allow for the development of new standards and assumptions which better reflect the relevant institutional characteristics of the public choice setting. While this step is a necessary precondition for the exposition of models of public choice which are at once both `formal' and truly `political', it is, nonetheless, a radical step.

A concern for the inclusion of relevant institutional characteristics in the design of public choice models is not new (despite the fact that such concerns are frequently attributed to a school of thought with the title:"the new institutionalism"). Buchanan and Tullock [1962] present early arguments for consideration of institutional factors in public choice. Rae [1971] compares various electoral settings in an effort to disentangle the particular effects of different voting procedures. Niskanen [1971] develops a model of

bureaucratic/legislative interaction which explicitly includes institutional factors as essential explanatory variables. To this list we might add the names of Shepsle [1979], Fiorina [1978], Weingast [1979], and many others. Still, despite this large and growing literature, resistance to an `institutionalist' view of public choice is well entrenched and not easily dislodged. Indeed, some of the works just cited, while including institutional factors in the models, persist in the use of notions of market-like equilibrium and efficiency as the standards of success.

The -often vain- quest for market-like mechanisms which yield stable, optimal equilibria in the public choice setting continues apace. It is buoyed up by the apparent stability manifested empirically in many public choice environments. While the desire to provide market-style explanations of this stability has occasionally led to errors in method, the more common result is a peculiar tendency toward `theoretical gymnastics' -often bordering on the absurd. In reading much of the public choice literature one often gets the feeling that a modification here or an altered assumption there would render visible some sort of political `invisible hand'. In any case, this devotion to a purely economic analysis of the public choice setting is a persistent `blind-spot' in many scholarly pieces.

With respect to these matters, this dissertation can be regarded as an `essay in craft'. Selecting a particular public choice environment, I propose to demonstrate the increased analytic power afforded by the rejection of a narrow economistic style of interpretation. In place of this style, I offer what I regard as a step toward a truly `political'

treatment of that environment. Of course, a direct comparison between these two approaches would be misleading. The development of a `political' style of analysis represents a quantum jump from earlier economic interpretations. This is because that which is problematic to a political scientist may not be so to an economist. Nonetheless, I freely admit that my idea of a `political' approach to public choice can do no better at finding the answers to standard micro-economic questions than the best efforts of a corps of welfare economists. More to the point is the fact that both these questions and their possible answers are irrelevant. The argued superiority of a `political' approach is established with respect to its ability to deal with `political' questions.

I have chosen to examine the literature associated with the public selection of levels of taxation for the provision of schools and other collectively consumed goods and services. While this area of study provides a fairly narrow focus, there are many factors present in this environment which are favorable to a `purely economic' approach and are not present in other public choice settings. The domain of alternatives is, at least overtly, unidimensional; thus avoiding the complications and disequilibria found in multidimensional settings (see: McKelvey [1976] and Plott [1967]). Within this domain, the range of alternatives manifests a natural ordinality expressed in mills of tax per dollar of assessed property value. It is reasonable to assume that this ordinality extends to the preference profiles of individuals within the electorate. This factor serves to further stablize the environment by reducing the likelihood of a problem of cyclical majorities. Moreover, this area of study has attracted the attention

of authors from the `institutionalist' camp as well. Thus, the selection of this narrow area may provide a crucial test of the relative power of the two perspectives.

In final form, this dissertation is organized into five chapters and an epilogue. In the first chapter I present a critical analysis of many of the published arguments concerning the tax referendum/public choice environment. My analysis is not be limited to a simple review of the literature. Rather, I attempt to highlight the strengths and weaknesses in many trains of thought. I am particularly interested in the rare attempts to apply theoretical models to empirical data. In these cases knowledge claims have been made of an explanatory nature. What I question is the plausibility of these explanations. From this analysis I attempt to locate crucial assumptions which may appear implausible or, at least, vulnerable. Once located, these assumptions are abstracted from the literature and provide the basis for a series of theoretical models.

An account of the development of these models and their rendering into a set of testable hypotheses is given in the second chapter. In the third chapter I present a description of the research designs and analytic methods employed in the actual testing of the hypotheses developed in the second chapter. Both of these chapters are relatively short and their contents are complementary. Nonetheless, between them they capture the essence of this research. While the first chapter yields little more than an outline of the argued weaknesses encountered in a narrow micro-economic interpretation of the tax referendum setting, the second and third chapters must make a case for the promised increase in analytic power afforded by the abandonment of

that approach and sets the terms under which this argument may be judged.

The testing procedures I have in mind involve experimental designs. The experimental setting provides a unique opportunity to isolate the pertinent assumptions of any theoretical model; they can stand out in a sharp relief which is seldom afforded in `real world' data. Nonetheless, I freely acknowledge that my experimental results are not `real world' data and, as such, cannot establish the final empirical truth of the matter. Whether we take this as a strength or weakness of experimentation depends upon the motives of the experimenter. In one sense, as stated above, any well derived formal model is true before it encounters the `real world'. Thus, in the analysis of these formal models, truth is not the issue. What matters here is just how useful these structures prove to be in the task of interpreting that `real world'. This usefulness is precisely what is often lost when formal models are applied empirically.

The criteria of `usefulness', themselves, reflect the motives of the researcher. My primary motive here is to develop a better understanding of the tax referendum/public choice setting as a political environment. The study of politics is, at root, a science of `winners' and `losers'. That is to say that, a political understanding bespeaks a game-theoretic orientation. Various actors fill separate and sometimes multiple roles within the environment. To each actor we may attribute a set of goals which can be summarized in a utility function. Individual behavior in pursuit of these goals reflects the strategic interaction between actors. The institutional conditions of the environment impose limits on this behavior and, thereby, set the

strategic balance. Given this, I judge a model to be useful if it illuminates certain characteristics of the strategic balance in the tax referendum setting and brings into focus various possiblities of strategy possessed by various actors. This notion of usefulness undergirds my presentation of the results of my experiments in chapter four.

Just as `the proof of the pudding is in the eating´, so the proof of the usefulness of my experimental results can only be ultimately established through the successful application of the concepts and patterns found there in an actual tax referendum environment. Choosing the appropriate format for such a setting is a ponderous task in and of itself. Were I to follow the general practice of most works in the literature, I would design a broad based econometric model to be applied to a large data set. However, application to a large data set might only serve to obsure strategic and case specific characteristics which may prove crucial in determining the election results. At this stage in the development of our understanding of the tax referendum environment I believe that a carefully chosen case study will yield more information than an aggregate design.

The fifth chapter of this dissertation presents such a case sudy. In looking for a `crucial case´ many legal and institutional factors recommend school districts in the state of Michigan. Even though the models developed here take a single election format, the selection criteria included consideration of the electoral history of the particular school district. Also included was the notion of a good balance between urban and rural populations within the electorate so as not to introduce a bias from this factor in the analysis. With all

these factors in mind, the September 2, 1980 millage election of the Sault Area Public School District was chosen as an appropriate case.

CHAPTER 1

A CRITICAL OVERVIEW OF THE LITERATURE

The Continental School

The first formal analyses of the use of public choice mechanisms in the selection of levels of taxation are Wicksell [1896] and Lindahl [1919]. While these two essays make distinct contributions to our understanding of taxation, they share a central theme. Both authors view taxation as the `price' paid by members of the polity for the output of government. This linkage implies that the selection of levels of taxation should be viewed as an exchange between government and individual citizens and can be analyzed in terms of `benefit/cost' calculations. Any conceptual scheme for the taxation decision which fails to include consideration of how the tax revenues are used to provide public benefits is regarded as fundamentally deficient.

In this day and age the demand that levels of taxation be linked to levels of government output does not seem very radical. Nonetheless, the Anglo-American economics literature failed to give serious consideration to this linkage until the period following the second world war (see, Buchanan [1968]). Thus, interest in the english-speaking countries for an exchange theory of taxation must be regarded as a fairly recent phenomenon. Still, if anglophones were slow to appreciate the contributions of Wicksell and Lindahl, their zeal for the program was no less once it caught on. Indeed, the postwar public finance literature reflects the values and aspirations

of the `continental school' (as the Wicksell/Lindahl view came to be called) in many important respects.

Both Wicksell and Lindahl are concerned that systems of taxation be `just'. For Wicksell, any taxation system is `just' if and only if it is capable of gaining -at least in principle- the unanimous support of those individuals subject to the tax. As strange as this notion may sound, Wicksell presents a persuasive case for it. In Wicksell's view, a `just' government functions as the representative of the collective interests of the polity. Its purpose is to provide those goods and services which address collective needs. If the benefits to be had from such collective action equal or exceed the `costs' of the taxation for each and every taxpayer, then unanimous consent is possible. Moreover, anything short of unanimous consent leaves open the possibility that some subset of the polity will be coerced into suffering the costs of government activities from which they derive no benefit. As Wicksell (in Musgrave and Peacock [1967]:89) puts it:

> "It would seem to be a blatant injustice if someone should be forced to contribute toward the costs of some activity which does not further his interests or may even be diametrically opposed to them."

Wicksell allows that there are immediate practical difficulties with the use of a unanimous decision rule. Every public good would have to be financed separately, and in some contexts, the unanimous decision rule may be wholly inappropriate. Even so, Wicksell maintains that an ideal taxation mechanism which is capable of gaining unanimous support is a real possibility and worthy of exploration. It was Lindahl who, building on Wicksell's work, first designed such a mechanism. The Lindahl tax scheme is both clever and conceptually simple. Lindahl is able to satisfy Wicksell's unanimity criterion through the device of a

tax pricing system which provides for the adjustment of individual fractional tax shares and total output of a public good.

An individual's tax share (`ti') is that fraction of the per-unit expenditure for the public good (`x') which is borne by the individual. An individual's total tax is found by multiplying the individual's tax share by the quantity of the public good which is actually produced: ti(x). We assume that each individual has a utility function which includes a functional statement of the personal utility derived from consumption of the public good as well as other sources of utility:

$$ui = vi(x) + yi$$

We further assume that each individual's resources are finite and that this is expressible in terms of a budget constraint:

$$bi = ti(x) + yi$$

Given the standard rationality assumption (i.e., under any given state of the world an individual will seek to maximize utility), we may identify the quantity of the public good demanded by an individual at any given tax price by taking the first derivative of the individual's utility function with respect to the public good and setting it equal to the assigned tax share.

Assuming that we wish to finance the public good entirely from tax revenues, the sum of the fractional tax shares must be greater than or equal to one. Assuming that we wish to avoid surpluses, we may ignore the `greater than'. Allowing for divergent tastes, an equal distribution of the tax burden is likely to yield markedly different levels of demand for the public good. The Lindahl tax scheme provides for adjustments in individual tax shares to correct this. Those

individuals who demand relatively less of the public good have their tax share decreased. This, in turn, should lead them to demand more of the public good. In order to maintain the sum of tax shares at unity, those who demand relatively more of the public good must have their tax share increased. This, of course, should decrease their demand. These adjustments continue until all members of the polity who pay taxes demand the same amount of the public good. This amount of the public good (called the `Lindahl equilibrium´) is capable of gaining unanimous support when the tax burden of its provision is `justly´ distributed on the basis of individual benefits through these adjustments in individual tax shares.

By casting the taxation decision in terms of exchange theory Wicksell and Lindahl borrow the values of the private market. The first fundamental value of market exchange is Pareto optimality. The aspiration to Pareto optimality is the soul of Wicksell´s notion of `justice´. In the private market, Pareto optimal outcomes result from voluntary exchange. Individuals exchange resources up to a point at which further exchange would result in a loss of utility for some party. Wicksell maintains the volunteerism of the private market in the public goods environment through the mechanism of unanimous consent. Nonetheless, Wicksell´s pronouncements on the subject are informal. The first formal specification of a sufficient condition for the Pareto optimal provision of public goods appears in Samuelson [1954].

The Samuelson condition for Pareto optimal output of a public good requires that the sum of the marginal valuations of the good (the first derivative of each individual´s utility function with respect to

the good) equal the marginal costs of producing the good. Samuelson notes that the Lindahl equilibrium meets this condition by tying tax shares to individual marginal valuations of the good. Since the Lindahl tax shares must sum to unity, this property extends to the marginal valuations of all members of the polity. Hence, the Lindahl equilibrium is on the Pareto frontier. However, the explication of this property for the Lindahl equilibrium does not lead Samuelson to an endorsement of the Lindahl tax scheme.

The primary flaw which Samuelson locates in the Lindahl tax scheme stems from the fact that the scheme requires absolutely honest demand revelation. Even so, the scheme provides a definite incentive for misrepresentation of demand to individual members of the polity. By definition, public goods are accessible to members of the polity on a non-exclusive basis. Thus, an individual's access to the benefits of the public good is not dependent upon the size of that individual's contribution toward its provision. Since the size of an individual's tax contribution is determined by a self-reported level of demand, a clear incentive for underrepresentation of demand exists. This incentive is most pronounced when two factors are in play. First, if an individual is reasonably assured that other members of the polity have relatively less elasticity of demand, the underreporting of the individual's preferences will have minimal impact on the level of the public good provided. Similarly, if the polity is relatively populous, again, the impact of an individual's misrepresentation will be minimal. However minimal these effects may be, it is clear that less of the public good will be produced and this entails fewer benefits for individual consumption. Nonetheless, this loss will be more than

offset by the individual's tax savings. The flaw in the Lindahl tax scheme is precisely the so-called "free rider" problem. On the basis of his analysis of the Lindahl system, Samuelson concludes that any decentralized tax pricing system will be vulnerable to such manipulations.

Faced with the immediate practical difficulties of the Wicksell / Lindahl program, serious scholars of public finance have been forced to accept more modest aspirations. Still, the basic tenets of the Wicksell argument have maintained a significant influence on the development of later models. The primary criterion of success remains Pareto optimal output from the public sector. Following Wicksell's lead, the use of consentual mechanisms, such as voting, appears to be the most promising avenue for the attainment of this result. By allowing those who are taxed to have some say in the level of taxation, government is held accountable for the use of tax revenue. This provides the link between taxation and expenditures which is established as a necessary condition for Pareto optimal provision of public goods by the Wicksell logic. If unanimity is too strict a requirement, then the question as to what is possible with less than unanimous consent becomes paramount.

Majoritarianism and the Bowen equilibrium

The most common decision rule in the public choice setting is the rule of the simple majority. Justifications for this rule can be made on both practical and normative grounds. Buchanan and Tullock [1962] provides an interesting argument for simple majority decision making

on the basis the associated types of decision costs under different decision rules. These authors devise a continuum of decision rules with one pole allowing a single voter to decide for the collective and the other pole requiring unanimous consent. At the first pole, the `costs' of this type of decision rule, which the authors label `external', involve the ability of some subset of the population to impose their will upon the whole. A continuum of these `costs' represents a scalar view of Wicksell's notion of `blatant injustice'. Given Wicksell's logic, such `costs' are eliminated at the extreme pole of the unanimous decision rule. Even so, it is at this opposite pole that another type of `costs' are at their most extreme. This second type of `costs' can be expressed in terms of the time and trouble required to reach a decision. Buchanan and Tullock argue that these two types of costs tend to balance out at the middle of the continuum. While the exact location of the `optimal decision rule' will vary under different types of decisions and distributions of preferences in the electorate, the authors claim that the simple majority decision rule stands out as roughly `optimal' for a broad class of decision settings.

Whether or not Buchanan and Tullock succeed in making a case for the simple majority is far from clear. Moreover, we run the risk of infinite regress when the question of the `optimal decision rule' must be decided prior to the question of the `optimal decision'. I bring these matters up merely to illustrate the extremes possible when notions of what is desirable become the only appropriate topics for formal works in public choice. In so doing I wish to set the tone for the following sections of this chapter. Having said this, it is

sufficient for all practical purposes to recognize that the rule of the simple majority is prevalent, and build a body of theory from this basis.

The first serious analysis of the taxation decision under simple majority rule appears in Bowen [1943]. Bowen argues that demand for public sector output is directly analogous to demand for private sector output, but collective consumption mandates that a single level of output be selected. This can best be done through a voting mechanism. Assuming that all possible levels of provision for some public good are available to the electorate, under a simple majority decision rule, "...one immediate amount ...will be voted for by more individuals than any other single amount."[p.37] This level of output is the quantity most preferred by the individual at the exact median of the distribution of preferences for the entire electorate. Thus, the `Bowen equilibrium´ is a `median voter´ result.

Political scientists usually associate the median voter result with Downs [1957] and Black [1958], but rarely acknowledge Bowen´s contribution. This is understandable given that Bowen´s treatment of the median voter result is fairly informal. Indeed, Bowen seems to simply assume its validity as a preface to a broader theory of the taxation decision. A formal understanding of the conditions for the median voter result is provided by Black. The primary condition for the existence of this result is given in Black´s notion of `single-peaked´ preferences. By definition, "...a single-peaked curve is one which changes its direction at most once, from up to down."[1958:7] If the alternatives available to the electorate can be ordered along a continuum such that the preferences of the electorate

can be represented as a series of single-peaked curves, the highest point on the preference curve of that voter at the exact median of the distribution of preferences is a Condorcet winner (i.e., it is the only alternative which can defeat all others in pairwise elections using majority rule).

With respect to the taxation decision, a natural continuum exists from lesser to greater levels of taxation. This, in turn, is taken as representative of lesser to greater levels of public goods provision. If an individual `most prefers´ some particular level of the public good, it is reasonable to assume that any movement away from that level in either direction along the continuum will lead to decline in preference. Hence, voter preferences will naturally tend to be single-peaked with respect to taxation. This usually cannot be said about other public choice environments. Preferences within the electorate for candidates, ideologies, or specific platforms seldom lend themselves to such orderly analysis. Since the problematic nature of the single-peakedness property is less apparent in tax referenda, Bowen´s failure to discuss it formally is perhaps understandable.

As should be clear from the above, Bowen´s primary concern is not the identification of the equilibrium point that bears his name, rather, most of his discussion focuses upon the specification of conditions under which this result will be economically efficient (read Pareto optimal). The Bowen model assumes: 1) a single dimension of choice given in separate taxation to finance each separate public good; 2) all members of the polity vote and vote sincerely in accord with their personal demand for the public good; 3) all costs of providing the public good are known; 4) whatever level of the public

good is eventually chosen, the costs of its provision will be divided equally amoung all members of the polity; and, 5) demand for the public good is normally distributed throughout the polity. From this assumptive base Bowen provides three results. If the per-unit cost of providing the public good is constant, the median voter result will be Pareto efficient. Given economies of scale, if the cost of provision is decreasing, again, efficiency will be a characteristic of the median voter result. However, if costs are increasing, efficiency is not assured.

We need not dwell on the means by which Bowen reaches these conclusions since it is clear that none of his five assumptions are above reproach. Still, despite the implausibility of Bowen's assumptions, his argument contains some interesting and useful insights into the practical environment of the taxation decision.

Bowen acknowledges that, in the `real world', the electorate is not presented with a choice between all possible levels of taxation or public sector output in any single election. For the most part, the voter's decision involves simply voting `yes' or `no' to a total package which is proposed by government. Since governments usually propose only one such package in any given election, the ability of the procedure to locate the median voter equilibrium is seriously constrained. However, if we look beyond the single election format and view the taxation decision as a process of incremental adjustment, the median voter equilibrium can be established in the long run.

Bowen's incremental adjustment model views the taxation decision as a series of elections. Assuming that the polity begins the process with some initial allocation of the public good (which may be as

little as none), each election represents a pair-wise comparison between this level and some new level proposed by government. The winning package in an initial contest may be subjected to further challenges by other alternatives in the continuum. With repeated challenges, the median voter equilibrium, being a Condorcet winner, may be located by a process of elimination.

The exposition of this incremental adjustment model is an important step for the Bowen argument and an equally important contribution to our general understanding of the tax referendum environment. In one stroke it provides the basis for empirical application of Bowen's theory and raises crucial questions with respect to the institutional factors which govern tax referenda. Within this model, government does not passively respond to the expressed demand for the public good in the polity. Rather, government must take an active role in structuring the agenda of alternatives through a series of elections. What procedures do or should governments follow in the fulfillment of this function? What motivates the activities of government in this role? What effect does the location within the continuum of that initial allocation have upon the playing out of the process? At what point should the process stop? What effect does the order in which alternatives are considered have upon the playing out of the process? Regrettably, these questions are left unasked in the Bowen piece. Indeed, Bowen seems to treat the entire issue of incremental adjustment as an aside -a begrudged concession to the `real world' which distracts attention from his quest for Pareto efficiency.

Empirical Application of the Median Voter Model

The search for appropriate empirical environments to apply the Bowen model (and other median voter models) has focused upon local community decision making with respect to expenditures. The preference for the local government setting is keyed to several simplifying elements which are found there and not at the higher levels (i.e., national governments). The relative homogeneity of local populations, the directly quantifiable nature of local expenditures, the limited array of such expenditures, and the immediacy of the impact of such expenditure decisions are often given as reasons for this preference. Still, there are deviations from this theme. To a certain extent, Bowen's article can be viewed as the first attempt to use a median voter model to interpret empirical data. In support of his notion that demand for public goods is normally distributed throughout the polity he examines data relating to demand for private goods; finds that marginal valuations tend to be normally distributed; and concludes that this pattern can be reasonably assumed for public sector output as well. Even so, Bowen's work, at best, should be regarded as a partial and tentative application of the logic of the model to empirical data. Bowen uses the data to shore up an assumption of the model, but, otherwise, refrains from subjecting the model to critical testing.

A more elaborate empirical exposition of the median voter model is given in Barr and Davis [1966]. These authors employ the model as a descriptive device in interpreting data concerning local government expenditures in various communities of Pennsylvania. Arguing that

local revenues are primarily derived from local property taxes and assuming that the preferences of the median voter are decisive in setting local expenditure policy, Barr and Davis use per capita assessed valuation of taxable real property and the percentage of property owners as surrogates for the tax price of public goods provision. Relative increases in the proportion of the electorate who own taxable property increase the probability that the median voter is a property owner and must bear the costs of public goods provision. This should, therefore, lead to a relative decrease in median demand and, hence, lower expenditures. On the other hand, relative increases in assessed valuation of taxable property within a community indicate greater wealth. If the median voter is relatively wealthier, he or she should have greater demand and, hence, higher levels of local expenditure should result. Both of these expectations are borne out empirically with significant coefficients of the expected sign.

However gratifying it may be to have their expectations confirmed in the data, the Barr and Davis work cannot be regarded as a test of the median voter model. The results indicate that local expenditures tend to rise and fall in the expected directions with the surrogates for tax price. While these results are consistent with the expectations of the median voter model, they are also consistent with any number of other possible designs. No attempt is made to locate median preference within the communities. Thus, we do not know if the ultimate levels of expenditure are greater or less than the median preferred level. Moreover, Barr and Davis simply assume that the median preference is decisive in determining these ultimate levels. It is quite possible that some other group in the electorate is actually decisive. Given

similar variation in the tax price surrogates, the results would be consistent with the mean income voter -or, indeed, any member of the electorate- being the actual decisive voter. Thus, the Barr and Davis piece does little to advance our practical understanding of the workings of the median voter model. Nonetheless, as Romer and Rosenthal put it: "The value of the Barr-Davis contribution is not in the empirical results, but in the stimulus provided by their attempt to link empirical work with a formal model of the political process." [1979:149]

Most of the works which have attempted to apply the median voter model to the taxation decision after Barr and Davis can be grouped into two categories. The first such grouping shares the telos of attempting to demonstrate the decisiveness of median voter preference in empirical data. Alternately, another set of authors have tried to make some determination of the relative efficiency of a median voter result. I shall briefly summarize these works, dealing with the former category first.

Is the median voter decisive?

Bergstrom and Goodman [1973] present a substantially refined view of the local expenditure demand function which makes use of notions of median preference as essential elements of the model. The model take a log-linear form with the key variables being household income and tax price. In this form elasticities are assumed to be constant and equal for all members of the polity. In so doing, the authors identify the median voter as having median income. They further assume that "...the

citizen with median income lives in and owns the house with median value and that his house constitues his entire holdings of real property."[p.284] Since the majority of local expenditures are financed via local property tax, the authors use a calculation based on median assessed valuation within a community to stand for their tax price variable.

Bergstrom and Goodman use data derived from ten states to apply their model. In deference to institutional differences in taxation procedures between states, data from each state is first treated as a separate sample, then pooled. Moreover, the authors consider three types of local expenditures separately: general (excluding education and welfare); police; and parks and recreation. The results offer modest support for the notion that median voter preferences (as defined by the the authors' assumptions) are decisive in the final expenditure decision. The regression coefficients for the crucial variables, which stand as estimates of income and price elasticities, tend to behave in the expected manner. In the pooled series, estimates of income elasticity are always significant and positive, while price elasticity is always significant and negative. Breaking the data up by the separate states yields occasionally insignificant results, but the authors are quick to point out that "...[i]n no case was an estimated elasticity coefficient both significant and of perverse sign."[p.287]

Given the apparent success of the Bergstrom-Goodman model, it became the basis for a series of later works by other authors (e.g., Pommerehne and Frey [1976], Pommerehne [1978], Pommerehne and Schneider [1978], and Inman [1978]). Nonetheless, the model is not

without its problems. On the face of it, the model might be judged superior to the Barr-Davis formulation in that notions of median preference are explicitly included in the explanatory variables rather than simply assumed. Even given this, we might quibble with the Bergstrom-Goodman specification of median tax price. Since most renters are on the low end of the income distribution, the proportion of the polity who are homeowners should be shifted up the income scale. Thus, the median income individual probably owns a house of less than median value. This could introduce a systematic bias in the estimates of price elasticity. That the estimates behave well despite this does not reflect well on the notion of median decisiveness. Moreover, the model does not provide for direct tests against specific alternative hypotheses. To a certain extent, Pommerehne and Frey [1976] and Pommerehne [1978] attempt to correct this by estimating the model using statistics based on the mean. The comparisons between models based on the mean and the median are not statistically conclusive however and much of the justification for the use of the median relies upon a preference for theory-based research over atheoretical specification.

On another plane, the results of comparisons between the mean and median in Pommerehne [1978] are, themselves, interesting. Using data from various Swiss municipalities, Pommerehne found that median statistics performed better in 48 direct democracies. However, in 62 representative democracies, the measures using the mean proved statistically superior. Romer and Rosenthal [1979], in their own critique of the Pommerehne results, suggest that this discrepancy may be attributed to differences in measurement. The median statistics

were calculated using only Swiss citizens, while the mean statistics used the entire population. Noting that about 20% of the population are foreign residents, Romer and Rosenthal argue that the results indicate that the preferences of non-citizens get little consideration in direct democracies. Still, this explanation assumes that the preferences of foreign residents with respect to local expenditures are substantially different from those of the citizen population, and that representative democracies are somehow more responsive to these preferences. Neither assumption is overly persuasive in that: 1) alien or citizen, both receive similar benefits from the expenditures at stake; and, 2) since aliens do not vote in either case, it is hard to see why elected representatives would champion alien interests to the detriment of their own constituency.

Perhaps a better explanation for the discrepancies in the Pommerehne results is found in the differences between the types of collective decision making employed in the two environments. While Bowen takes pains to argue for the applicability of his median voter model in representative or indirect decision settings, it is clear, even in his original article, that the institutional conditions of direct democracies provide a more solid basis for the expectation of the Bowen equilibrium. In the American setting, given the decline of the town meeting, there are very few instances of direct democracy. One possible exception is the use of popular referenda to set tax rates for the provision of public education. Since educational expenditures generally take up the lion's share of local budgets, this particular decision setting is clearly important. Moreover, these tax referenda are usually limited to educational matters. Hence, a single issue

format supports the notion of unidimensionality required by the median voter models. All this has led Romer and Rosenthal to proclaim: "...if researchers are ever to find an empirical context that is approximately unidimensional and single-peaked, school expenditures appear to be an appropriate choice." [1979:147] While the Bergstrom-Goodman piece explicitly excludes educational expenditures from the analysis, later works which apply the Bergstrom-Goodman model to American data limit themselves to this area of application. A case in point is Inman [1978]. Inman is concerned with directly testing an ancillary set of assumptions within the Bergstrom-Goodman model. In so doing, Inman uses tax referenda results from 58 Long Island school districts as a data set.

The original specification of the Bergstrom-Goodman model does not allow for great diversity of tastes with respect to expenditures between communities. That is to say that, by explaining levels of expenditure in terms of median income and tax share other cultural and psychological factors which might effect median preference are overlooked. Bergstrom and Goodman recognize this weakness in their model and develop a theorem to account for taste specific differences between communities. The theorem assumes that any given community may be disaggregated into socio-cultural subgroups. These subgroups may differ in tastes from one another, but are assumed to have consistent tastes across communities. Thus, the impact of diversity of tastes can be specified as a shift factor derived from the proportional make-up of various subgroups within a given community. This shift factor will have a multiplicative effect upon the median level of demand. Nonetheless, rather than explicitly trying to incorporate this notion

in their model, Bergstrom and Goodman simply include a set of demographic variables to stand for the shift factor.

While the Inman study attempts to directly estimate the shift factor described by Bergstrom and Goodman, Inman's motives for doing so may not fit precisely with the Bergstrom-Goodman plan. Rather than using the estimated shift term to improve the predictive power of the model, Inman attempts to demonstrate the shift term's irrelevance. In so doing, he hopes to make the case for the use of median income, unmodified, as the ideal surrogate for median voter preference. The means Inman employs to make his case come down to standard hypothesis tests of significance on the estimated shift term, `s'. If s = 1, then ln(s) = 0. An `s' equal to one would provide no multiplicative effect in the predicted expenditure outcome using median income. Thus, ln(s) = 0 is used as the null hypothesis. Inman estimates ln(s) using ordinary least squares and two-stage least squares for each of his 58 school districts. None of the 58 OLS estimates prove significant at 95%, and, while 13 TSLS estimates acheive 95%, they fail at 99%. Given these results, Inman boldly claims to have `buried politics', asserting:

> "...we can model local fiscal choices as an individual utility maximizing problem and transfer to government behavior the usual theorems of consumer choice. Politics becomes economics. This is a powerful conceptual advantage, and one which justifies much of the theoretical work to date on the behavior of local governments." [p.59]

Despite such claims, it is clear that in Inman's zeal to `bury politics' he has forgotten the elementary logic of hypothesis testing. In failing to reject a null hypothesis, at whatever level of significance, we are not allowed thereby to accept the null hypothesis as the truth of the matter. To do so would commit the fallacy of

affirming the consequent. At best we may allow that the null hypothesis is one of a theoretically infinite number of plausible candidates. In short, no substantive conclusion can be made. To paraphrase Mark Twain, the reports of the death of politics appear to be premature.

Inman's results are further complicated by specification problems in the model itself. As in the Bergstrom-Goodman model, all income distributions are assumed to be lognormal and each subgroup distribution is proportional across cities. Inman further assumes that subgroup distributions are proportional to the overall distribution for each city as a whole. Romer and Rosenthal [1979] demonstrate that these assumptions trivalize the use of median statistics since, given them, parameter estimates (excluding the intercept) would be unchanged regardless of which fractile of the income distribution is used. We might as well use the voter at the 55th (or any other) percentile. Romer and Rosenthal rightly conclude that:

> "...Inman's method is caught in a crossfire. If a median regression proves superior to the use of other fractiles, the assumptions used to justify the model are contradicted. On the other hand, if all fractiles give similar results, then any voter appears `as if' decisive." [p.153]

The discussion above should serve to highlight some of the difficulties encountered when we try to assess the notion of median decisiveness empirically. Several problems stand out as apparently insoluble in the literature discussed so far. First, of course, no means has been found to demonstrate median decisiveness empirically. The best efforts of Bergstrom and Goodman [1973] and Inman [1978], while explicitly including median statistics in the specification of the model, ultimately can do no better than simply assuming the

dominance of median preference. Moreover, even assuming median decisiveness, these models do not demonstrate that the expenditure level selected is that level most preferred by this pivotal voter. The most reasonable assumption is that people vote in accord with their preferences, but we lack the omnipotence to measure these preferences directly. In place of such measurements these authors have used surrogates such as income, assessed valuation of housing, and proportional membership in various socio-cultural subgroups (to stand for divergent tastes). The resulting regressions, at best, might demonstrate a functional relationship between the selected level of expenditure and these variables (perhaps even median values of these variables). Nonetheless, this is a far cry from the assertion that the median voter receives his or her most preferred outcome. The function in question might yield outcomes which are ten times greater or twice as small as the median voter's ideal.

Is the median voter decisive? If so, does the median voter recieve his or her ideal outcome? The authors cited above have not answered these questions, and, in truth, we may never be able to answer them in empirical terms. Still, the pursuit of these answers does not exhaust the possible empirical applications of median voter models of the tax decision setting. At this point, I shall briefly discuss another parallel set of empirical research which has been oriented toward a different question. Specifically, this set of authors have tried to assess the relative efficiency of a median voter result in the tax referendum environment.

Is the median result optimal?

Barlow [1970] presents a truly seminal attempt to assess empirically the relative efficiency of a median preferred allocation of local educational expenditures. In doing so, it should be noted that Barlow does not succeed in demonstrating median decisiveness or that median ideal preference is guaranteed. Rather, Barlow simply assumes these notions in order to examine the efficiency characteristics of such a result. In a similar fashion to those authors cited above Barlow assumes that preference is primarily a function of income and tax price (as measured by assessed valuation of real property). Thus, individual demand for education is summarized by the equation:

$$Qi = kYi^{a} Pi^{b}$$

Where `Q' denotes a preferred quantity of education; `Y' denotes income; `P' denotes tax price; and `a' and `b' denote elasticities of demand. Demand elasticities with respect to price and income are assumed constant, as is the term `k'. Given this equation, the marginal benefit for any individual `i' at any given `Q' can be found by solving for the price `P' that this individual would willingly pay:

$$Pi = (Qi / kYi^{a})^{1/b}$$

Further, any individual `i' receives a share of marginal social benefit as defined by the equation:

$$Pi/ \Sigma Pi = Yi^{-a/b} /\Sigma Yi^{-a/b}$$

Barlow notes that the share of social benefit received by `i' does not

depend upon the particular `Q' selected.[p.1033] This is the result of assuming that demand elasticities with respect to price and income are constant.The implication is that shares of social benefits also remain constant for any given `Q' and are set by an exogenously determined tax pricing scheme. Thus, an individual's share of marginal social benefit would be the same for an efficient `Q' as for an inefficient `Q'. This becomes the crucial factor in assessing the efficiency of a median preferred result.

Assuming median voter decisiveness and given Samuelson's conditions for optimal allocation in a public good, Barlow's analysis shifts to the question of whether this crucial voter will select a socially optimal allocation. Barlow argues that the median voter will select a socially optimal allocation of the public good if and only if the voter's share of the tax burden of providing the good is the same fraction as this voter's share of marginal social benefit. Thus, a ratio between the median voter's share of the tax burden and his or her share of marginal social benefit must equal unity. Moreover, the extent to which this ratio varies from unity (in either direction) will indicate the extent to which the good is over or under provided. By making the assumption that the median voter is the individual with median income, Barlow is ready to estimate the efficiency of the median voter result empirically. All that is needed is a data set which provides information concerning income, tax burden and the size of the tax base for any given polity.

Barlow makes use of data provided by Musgrave and Diacoff [1958] for Michigan in 1956. The data is grouped by income into seven groups. Using proportions within groups as provided by 1960 census data,

Barlow is able to estimate the location of the median voter through interpolation of the data. Estimates of elasticities of demand are made from cross sectional data for Michigan school districts. Given this, Barlow is able to produce estimates of median tax burden, and the median share of marginal social benefit. The resulting ratio is estimated at roughly 0.5. Thus, Barlow concludes that the median voter result for Michigan in 1956 would provide education at a level below the social optimum. Given an estimated price elasticity (b) of -0.34, Barlow calculates that the change in median tax burden required to raise the ratio to unity would produce a 26 percent increase in median demand. This defines the extent to which the median voter result falls short of efficiency.

Barlow's model provoked a series of comments, modifications and critiques. Bergstrom [1973] noted that the Barlow results are crucially dependent upon the shape of the income distribution and the relative progressiveness of the prevailing tax structure. Given modifications in either or both of these factors different results would maintain. These observations, of course, hardly count as a biting critique of Barlow's work. Indeed, Barlow is quite aware that the final estimates reflect the standard notion that "...residential property tax is steeply regressive with respect to income..." [1970:1035]. Nonetheless, by allowing for variation in the tax structure, Bergstrom is able to specify sufficient conditions for results which both yield and exceed the social optimum. In so doing, Bergstrom not only demonstrates that allocations below the social optimum do not necessarily follow from majority choice systems, he further underscores the importance of prevailing institutional

factors in determining the outcomes.

On another tack, Edelson [1973] questions Barlow's specification of the problem on several levels. Edelson notes that public education is not entirely financed by taxes levied on voting members of any given school district. Rather, in most states, various government general funds provide both lump sum and matching grants which supplement the resources generated by local property taxes. In addition, business property provides yet another source of support from nonvoters. The existence of such external sources of financial support should effect the ultimate allocation of education in the district and, thereby, have an impact upon calculations with respect to relative efficiency. Further, Edelson argues for the abandonment of the individual household as the unit of analysis in favor of calculations relating to individual children of school age within the district. This notion reflects Edelson's rejection of the treatment of public education as a Samuelsonian "pure public good".

In principle, a "pure public good" is held in common and one individual's consumption does not limit the consumption of others. In this sense, it should be both nonexclusive and inexhaustible. Despite collective and egalitarian provision, public education does not meet either condition. Thus, Edelson argues, calculations with respect to public demand (particularly income and price elasticities) should reflect individual consumption. Since elasticities of demand play a crucial role in the estimation of the benefit/burden ratio for the median voter, any shift to calculations on the basis of `per pupil expenditures' could substantially change estimations of the relative efficiency of the median result.

The move toward parameter estimates which reflect individual consumption introduces a profound degree of complexity in the model. As Edelson notes:

> "It is obviously unrealistic to assume that each voter shares the same fraction of total output. Certain voters do not use the public schools at all (parents with children in parochial or secular private schools, aged couples, unrelated individuals), while others have different numbers of children enrolled in public schools." [p.168]

Edelson disregards the second source of variation by simply assuming that the average number of children per voter is constant across income classes. However, the proportion of voters who derive no direct benefit from public education proves to be a thorny problem indeed. To deal with it, Edelson imposes a set of assumptions concerning voter behavior which he supports through reference to demographic data from the U.S. Department of Commerce. Given this data, 13 percent of the voters in each income class are assumed to vote against any school budget beyond a constrained minimum. Since there is a greater proportion of private school users in the upper extreme of the income distribution, an another 17 percent of the highest income class is added to this corps of `no' voters. Armed with this new battery of assumptions, Edelson dutifully cranks out new estimates of the model parameters using the Barlow data.

While the notion that some voters do not derive direct benefits from the public school system presents little more than a complicating factor in Edelson's respecification of the Barlow model, Barzel [1973] makes it the keynote of a fundamental attack upon Barlow's entire enterprise. Barzel reasons that voters who make use of private or parochial schools will have little or no demand for the public school

system. The Barlow model assumes that demand for public education will always increase with increases in income. However, given that use of private schools also tends to increase with income (particularly in the highest income group), this assumption cannot hold. As a result the use of median income to define median preference is precluded; the crucial voter should, in general, have less than median income.

How does the shifting of the location of the crucial voter effect calculations with respect to the efficiency of the median voter result? On the surface we might conclude that, if the median preferred quantity of public education under the Barlow model was less than optimal, any shift to lower levels of the income distribution should yield an even greater shortfall. Still, Barzel rejects this interpretation out of hand:

> "When the higher-income households move out of the public school system, they themselves now obtain whatever amount of education they desire. Their tax contribution then is basically a transfer payment- entirely from the rich to the rest of the community. The clear-cut regressive nature of financing public schools through property taxes present in Barlow's model no longer holds." [p.178]

Does this imply that the ultimate allocation is, in fact, closer to efficiency? Barzel points to several factors which inhibit any straightforward answer to this question. Lacking specific information with respect to the income distributions within the higher income groups, we cannot locate the "break-even" point at which households opt for private alternatives to public education. Moreover, given diverse populations between the several school districts in Michigan, any pronouncements concerning the relative efficiency of allocations can only be made at the school district level and not for Michigan as a whole. Still, even if we were able to overcome these obstacles,

there remains one element which may be fundamentally damning to the entire enterprise.

The presence (and, indeed, the success) of the private education alternative leads Barzel to argue that education itself is in principle a private good. Barzel is quick to point out that, even on the basis of the rudimentary data available, there is a clear incentive for a majority of the polity to favor collective supply. Nonetheless, collective supply does not change the nature of the good. This notion of schooling as a private good is borne out empirically by the lack of uniform consumption even at the individual level. Accepting this, Samuelsonian interpretations of public sector optimality may not be applicable. As Barzel puts it: "[t]he concept of the `efficient quantity' is itself meaningful only when uniformity is imposed."[p.185] Thus, Barzel concludes his critique of Barlow's work by pointing out that questions with respect to the relative efficiency of median educational preference may themselves be theoretically meaningless, regardless of the manifold practical difficulties involved in answering them.

On the formulation of an inquiry

For the purposes of this dissertation, one is tempted to regard the foregoing discussion (indeed, this entire chapter) as a cautionary tale. What has been demonstrated, after a promising start, is the potential for studies of the tax referendum environment to move rapidly toward an seemingly endless series of dead ends. If this is typical of the ways in which sciences advance, the prevailing

statistics on mental health among academics may be well justified. Nonetheless, I have no intention of abandoning this enterprise in favor of the plumbing trade. In any case, there is much to be learned from these apparent failures. Where, then, have these authors failed?

To paraphrase the German metaphysician Martin Heidegger, every inquiry begins with the formulation of a question. The formulation of the question presupposes the nature of the answer in that, by its formulation, the question structures the methods of the inquiry and sets out standards for judging the relative success of proposed answers. The lines of inquiry discussed above proceed from questions formulated chiefly by Bowen: Is the median preference decisive?; Is the median preference efficient? These formulations remain unchanged despite the contributions of the several authors. After following the tortuous chains of argument presented above it seems that neither formulation allows for successful answers. Indeed, given Barzel's argument, we might conclude that the latter cannot be meaningfully asked. If the authors have failed, perhaps the single most important source of their failure is the nature of the questions they seek to answer. What remains for this inquiry is a reformulation at the most basic level. What is needed here are questions that can be both asked and answered. Moreover, to formulate these questions we need not wander far from these failed efforts. The basic source of such a reformulation can be found in the very works criticized above.

The various analyses of the tax referendum environment discussed above have emphasized the outcomes of a policy making environment. In so doing, they remain true to the committments of the discipline of economics in so far as it has made a contribution to the development

of policy science. Policy science, which I take to be the study of public policy making and implementation from various aspects, is not the sole province of any particular academic discipline. Nonetheless, it has long been dominated by economics. Political scientists, for their part, have dutifully adopted techniques of analysis borrowed from economics (e.g., econometrics and welfare economic modeling) as tools in their own participation in the practice of policy science. Still, if political approaches to policy science cannot be distinguished from economic approaches in terms of subject matter or technique, such a distinction can be made in terms of the relative emphasis placed upon process and outcome.

The `bottom line' for economic approaches to policy science is the location and evaluation of predicted outcomes in a policy environment. The processes involved in public policy making are important in so far as they provide the means by which policy outcomes are generated, but primary emphasis is reserved for the outcomes themselves. Given this emphasis, the processes themselves are seldom treated as problematic. Rather, they are incorporated in the axiomatic base of a given model and, thereby, assumed as given a priori. The various basic models cited above well exemplify the economic approach to policy science. Institutional and environmental conditions governing voting, the distribution of costs and benefits, and the motives of various actors are assumed at the outset. Once these assumptions are stated, little attention is given to them. Nonetheless, in terms of the critiques above, this is the precise location of where these models fail.

The relative neglect of these `process' variables reflects the general disdain in which economists hold political questions. Politics

is, after all, a messy business. The stability and parsimony of the marketplace is wholly replaced by the chaos of political gamesmanship. While few of the authors cited above are as outspoken in their denunciation of politics as Inman, most, I suspect, would share his general regard for politics and would rather not delve into such murky matters. Still, the environment they model is profoundly political.

It is here that a political approach to modeling can make a unique contribution to our understanding of this particular policy setting. As indicated in the introduction to this dissertation, political approaches are distinguished from economic approaches in that they are guided by the fundamental Lasswellian question of `who' benefits and `how' they achieve their benefits. This involves a greater emphasis upon the behaviors of individual actors, their motives, and the strategic possibilities available to them as given in the institutions and processes extant in the environment. While an analysis which reflects concerns for these elements may prove more rewarding than a narrow economic approach (indeed, this is exactly what this dissertation is designed to demonstrate), it is, nonetheless, a much more detailed treatment of any particular policy environment. The tax referendum setting is no exception to this requirement of greater detail.

The tax referendum environment includes school boards, school administrators, organized interest groups (particularly faculty and parent groups), and, of course, the electorate. While these sets of actors must collectively select a single alternative level of taxes and expenditures, they individually do not evaluate this result from the same or similar utility functions. Moreover, each separate group

plays a different role in the selection process with different means of influencing the final selection in accord with their own preferences. The interplay of strategies may, indeed, be a messy affair, but an understanding of the dynamics of this conflict is a necessary prerequisite for the type of analysis proposed by the authors cited above. Thus, this chapter concludes with a call for a `political' analysis of the tax referendum environment.

In the next chapter I define the parameters of this analysis and lay out new formal models to be tested. The emphasis of the analysis is the dynamics of strategic interaction in the tax election setting. Still, the notions of equilibria and stability championed in the works cited above are not absent from the inquiry. There is certainly a place for consideration of equilibria in political approaches to policy science. If nothing else, the potential for stable equilibria in any public policy setting acts as a constraint upon the behavior of the parties to the policy making process.

Occasionally, these limitations are overwhelmingly important. Holcombe [1977:80-82] describes a system of collective tax choice which constrained the outcome to a median voter equilibrium regardless of the preferences of various organized interest groups. The system was used in Florida between 1939 and 1968. Voters indicated their preferred level of expenditure directly on their ballots. These levels were rank ordered and (assuming single-peaked preferences) the median outcome was found by selecting the quantity desired by the median individual in the distribution. Here is the economists' dream: a straightforward political system which yields a stable equilibrium. Nonetheless, the very fact that Florida has abandoned this system

points to the relevance of political variables even here.

CHAPTER 2

THEORETICAL ORIENTATION

While the discussion presented in chapter 1 deals with several approaches and models, the themes and primary research questions addressed in most of them reflect the concerns articulated in Bowen[1943]. In closing the last chapter I have argued that the failures of these lines of inquiry stem from the limited nature of those `research questions' as formulated by Bowen. The task in this chapter is to reformulate the inquiry so as to include certain elements of the political environment which were either overlooked or pointedly ignored by the authors discussed in chapter 1. That is, here I shall define a new set of parameters within the political context of tax referenda. These are to be incorporated into the research enterprise with the hope that they may afford a broader understanding of this particular environment than was possible under the assumptive base of the Bowen model.

It should be noted at the outset that this reformulation marks a major redefinition of the research task itself. This dissertation will not `rework' Bowen yet again. Rather, what is presented here is best described as a first tentative attempt to formulate a `political' model of the tax referendum environment as distinct from the `economic' approaches employed by Bowen and those which followed him. As noted in the last chapter, this distinction is not made in terms of subject matter or methods, but, rather, in terms of what is taken to be problematic. Where the `process' variables are subordinate to the evaluation of potential outcomes in the `economic' models discussed in

chapter 1, a `political' model champions the primary salience of the processes themselves. While both approaches include both process and outcome as elements in their basic design, the relative emphasis placed on each is profoundly different. Hence, the questions addressed are themselves conceptually distinct. Nonetheless, given the common elements between the two approaches, the reformulation proposed here may rely upon the prior work (particularly Bowen's model) as a guide. In defining what parameters are relevant here we might consider what is assumed away previously. This, at least, seems a reasonable place to start.

As noted in the last chapter, Bowen's attention to the `real world' issues of the process by which an electorate selects the median preferred quantity of tax and/or expenditure is given in his exposition of an incremental adjustment model of tax choice. Within this model a series of alternatives are pitted against the status quo and the Condorcet winner is located by a process of elimination. While I have argued that many questions concerning the practical difficulties of this approach remain unasked in the Bowen piece, one point stands out as immediately relevant to the task here. In presenting this incremental adjustment model Bowen relies upon some agency of government to structure the agenda of alternatives available to the electorate. For the purposes of this chapter, perhaps the single most important assumption of the Bowen design is given in the manner in which Bowen addresses the motivations and incentives which affect this government agency in terms of its behavior as an agenda setter. While Bowen does not deal with these issues in any direct sense, this is not to say that such motives are not implied.

Clearly, in order for the median preferred allocation to prevail it must be proposed by the agenda setter. The agenda setting agency described in Bowen's incremental adjustment model uses the electoral mechanism itself to identify and propose the median preferred alternative. The fact that this agency must actively prosecute this task implies that it is not simply an inert instrument of the electorate. Rather, from this we may infer that such agenda setters behave as the active agent of median preference. In principle, Bowen assumes that this set of actors share, or at least behave as if they share, the preferences of the median voter. While such an assumption certainly acts to simplify the model, the normative commitment involved is far from trivial.

What would be the effect of attributing other particularized motives to the behavior of Bowen's agenda setter? A growing body of literature (e.g., Niskanen[1971], Plott and Levine[1975], Mackay and Weaver[1978] and others) suggests a broad array of opportunities for strategic manipulation of the outcome in various collective choice environments with structured agendas. Nonetheless, the idea of external agenda control used for selfinterested motives does not preclude the possibility of stable equilibria. Indeed, the fact that agenda control itself is an institutionally relevant condition bespeaks the presence of other potentially salient institutional factors which may constrain the agenda setter to a single outcome or limited range of outcomes. Yet another growing body of literature (e.g., Shepsle[1979], Riker[1980] and others) suggests the possibility of institutionally enforced equilibria even in cases where no equilibrium would otherwise exist. The key to the identification of such results lies in the

careful articulation of the relevant institutional conditions and motives extant in each institutional setting.

This chapter of the dissertation recasts the issues of the tax referendum setting in terms of these `institutionalist' concerns. These are the `process' variables from which I shall reformulate the inquiry. The first issue to be dealt with involves the motives which guide agenda control. From this point I shall turn to consider other relevant factors which may serve to shape and structure the possible outcomes from a formal vantage.

Problems of Agenda Control

Some twenty-two states use tax referenda for the financing of public education. This allows a wide variety of legal and organizational procedures governing the selection of alternatives. Even so, by far the most common source of taxation proposals is the local school board. Given this, we may consider several possible explanations of why and how school boards make these proposals.

Since school board members are usually elected representatives, it might seems reasonable to assume that their attitudes on taxation issues should, at least, not be inconsistent with those of the electorate at large. The representative character of the school board may provide a decisive bias towards the median preference of the electorate. This is to say that, since a school board acts as a committee (usually operating under majority rule) and assuming that the attitudes of the board stand as a representative sample of the attitudes of the electorate, the median preference within the school

board should be roughly equivalent to the median preference of the electorate at large. This is, in effect, the argument presented by Bowen. Holcombe[1975] takes the notion of representation within the school board even further to argue that electoral sanctions will be imposed upon members of any school board which attempts to propose excessive levels of taxation. As elected politicians mindful of the problems of reelection, school board members will toe the median line.

This line of reasoning fails to take into account the fact that candidates for local school boards seldom if ever run for office on the basis of their attitudes toward taxation. Moreover, the image of local school boards as populated by Downsian politicians of Holcombe's sort, seems well out of step with most local communities. Perhaps in large urban settings the political professionalism of school board members is relatively acute, but for the most part school board members tend to be little more than `involved' citizens who care enough about the schools in a community to seek what is often actually or essentially a volunteer position. Given this, candidate platforms tend to reflect the motives of the `pure of heart'.

Attitudes toward education in general, specific education policies, and personal experience are common themes in bids for election to the school board. Taxation policy is rarely a factor. Nonetheless, there is a case to be made which casts doubts upon the notion that the tax preferences of the typical school board should simply mirror those of the electorate at large. In saying that most school board members are simply `involved' citizens we should consider the nature of their involvement. While school boards contain individuals of various

backgrounds, those individuals who are attracted to the job in the first place tend to be those who see immediate intrinsic value in the goods and services provided by the educational system. It is no accident that parents and professional educators occupy a large share of the seats on local school boards across the country. These groups can be classed as `high demand'; which is not to say that they are insatiable in their demand for education, merely that they place a greater value upon this particular public good than might other groups within the electorate. On the other hand, `low demand' groups are typically underrepresented on most school boards. Given this imbalance of representation, there seems little hope that the median preference of the typical school board is in synch with the preferences of the median voter.

In noting that attitudes toward taxation policy is seldom offered as a qualification for election to a school board it should be recognized that matters of school finance are largely regarded as an administrative task. In these matters the guidance, resources and support of educators and school administrators play a vital role. While there is considerable room to debate the actual budgetary preferences of the typical school board members, such is not the case with this group of actors. Those whose livelihood is predicated upon the size of the local school operating budget have a clear incentive to lobby for maximum allocations. Whether this group is capable of bending the school board to its will (the `pure of heart' are often easily conned) or, alternately, the `high demand' characteristics of typical school board members provide a sympathetic audience to the budgetary demands of administrators, the outcome is the same. In

keeping with this logic Barlow[1970:1030] dismisses the notion that school boards would hesitate to propose high levels of taxation.

If we accept that school board behavior in proposing levels of taxation is likely to be more representative of the interests of budget maximizing administrators than those of the electorate at large, the theoretical structure of the tax referendum environment is profoundly changed. The school board is viewed as a monopoly supplier of a public good with control of the agenda of alternatives available to the electorate and an incentive structure which, essentially, favors progressively increasing levels of taxation. The electorate, for their part, function as a monopoly consumer of the public good (a monopsonist). The preferences of the electorate favor the median preferred alternative, but this result cannot be enforced without the cooperation of the school board. The fact that school board members are themselves voters is trivial. For the sake of analytic simplicity we can regard the two groups as separate and their relationship as adversarial within the context of a bilateral monopoly bargaining game. The preferences of the electorate constrain the school board's ability to maximize the school budget since their proposals are subject to voter approval. The ability of the electorate to enforce its preferences is checked by the school board's agenda control.

The situation described above mirrors the model of congressional decision making with regard to bureaucratic budgets presented in Niskanen[1971] in every important respect. This similarity led Holcombe[1975] to propose a model based on Niskanen's work as a possible alternative to a Bowen-style median voter model in analysis of results of school millage elections in Michigan. Holcombe argued

that the legal and institutional characteristics of Michigan are particularly favorable to a Niskanen-style interpretation. In testing his model, Holcombe was able to identify a limited set of specific elections in which he claimed the school board's agenda control had yielded millage rates in excess of the median preferred level. Still, Holcombe's general assessment of the predictive success of the Niskanen model is negative. In interpreting the aggregate results he concluded that the average millage rate in Michigan more closely resembled that which would be predicted from a median voter model. This, of course, implies that some districts have millage rates below the median predicted level to offset those districts which he identified as being in excess of that level. Nonetheless, Holcombe champions the median voter model as a better general rule of thumb.

We need not accept Holcombe's conclusions as the final word on the comparative success of the Niskanen model as applied to tax referenda. If for no other reason, his operationalization of several key parameters is open to critique. Still, those who would accord significance to agenda control and Niskanen-style arguments must both account for the failure of Holcombe's efforts and provide a basis for a more adequate specification of the model. To do so we must carefully examine and test the various implications of the Niskanen approach as applied to this setting.

Niskanen, Sophistication, and the Bargaining Range

The Niskanen model of congressional decision making with regard to bureaucratic budgets is quite simple in design. Niskanen acknowledges that the model is weighted toward the supply side of the public goods allocation process. Collective demand for the output of some bureau is summarized by the median legislative preference profile which is assumed at the outset. This `total evaluation curve´ is given by the equation:

$$B = aQ - bQ^2$$

(where:`B´ = the bureau´s budget; `Q´ = level of bureau output; and, `a´ and `b´ are greater than zero). The costs of producing any given level of output are defined by the equation:

$$C = cQ + dQ^2$$

(where:`C´ = total cost; and, `c´ and `d´ are greater than zero). The budget maximizing bureaucrat, being privy to this information and having complete agenda control, faces a simple constrained optimization problem. Once the bureaucrat locates the maximum budget that the legislature will bear, all that remains is to propose that level. Assuming, as the model does, that legislators are passive participants who vote sincerely according to their preferences, the bureaucrat is assured of the proposal´s success.

The Niskanen predicted level of output is always in excess of the socially optimal level. Thus, the model has gained favor with several circles of public welfare economists and provides major theoretical

support for those who would argue for the privatization of the supply of public goods and services. Nonetheless, it is oddly constructed in many respects. The empirical conditions of bureaucratic/legislative interaction correspond to a bilateral monopoly bargaining game. However, as these interactions are depicted in Niskanen's model, no bargaining is involved. The legislature makes no use of its position as a monopsonist. In effect, the legislature simply gives over its total evaluation curve to the bureau and allows the bureau to make the final budgetary choice. The fact that bureaucrats have no actual vote in the final decision is excluded from the model. Given the assumption that legislators are passive and vote sincerely, the actual voting is relegated to a pro forma exercise.

Legislative behavior, as depicted in the model, is not irrational in a strict sense. After all, the model assumes that legislators always vote in a manner absolutely consistent with their expressed preferences. The fact that these preferences still serve as a constraint upon the success of the budget maximizing bureaucrat indicates that the legislature has not totally abdicated from its role as a counterforce. Still, if legislative behavior cannot be said to be irrational within the model, it is, at least, viewed as relatively unsophisticated.

In game theoretic terms, sophisticated play involves a willingness to discard strategies which would follow from a straightforward adherence to the institutional `rules of the game' in favor of more complex, but potentially more successful, strategies of a less obvious sort. Moreover, sophisticated play usually involves a modicum of risk. The success of a sophisticated strategy often rests upon control of

uncertainties over various aspects of the gaming environment. Such control is afforded by the careful gathering of information and the formulation of assumptions concerning the expected behavior of other players. Information may be incomplete and assumptions may fail. The choice of which risks are acceptable and the ability to develop complex strategies depend primarily on skill and experience within the gaming environment.

The attention paid by game theorists to the concept of sophistication has, for the most part, been limited to the cataloging of various techniques and strategies available to players in specific gaming environments. Farquarson[1969] applied the concept to simple committee voting over discrete alternatives. Samuelson[1954] made a case for sophisticated behavior in decentralized tax pricing systems through the false revelation of preferences. Plott and Levine[1975] demonstrate the potential for sophisticated play through the careful ordering of the agenda of alternatives available to a committee. The Gibbard-Satterthwaite theorem established the potential for sophisticated strategies in virtually any collective choice setting. (Gibbard[1973] and [1977]; Satterthwaite[1975])

In the Niskanen model a high level of sophistication is assumed on the part of the bureau. Similar sophistication is denied to legislators by assumption. It is this imbalance which allows Niskanen the simplicity of his model despite his admission of the bilateral monopoly characteristics of the environment he is modeling. The assumption that legislators lack sophistication is not well justified. Indeed, the notion of passive naivete as characteristic of legislators does not square with the common image of the politican as a well oiled

Machiavellian machine. Miller and Moe[1981] justly take Niskanen to task on this basis. They argue that if the budgetary interactions between legislatures and bureaus truly yield suboptimal results the fault lies with the legislature rather than the institutional structure of those interactions.

In the tax referendum setting it is the electorate, rather than the legislature, which acts as the monopsonist. In this decision setting the assumption of relatively low levels of sophistication on the part of the monopsonist appears much more plausible. The ability of the electorate to coordinate a sophisticated strategy to counter the school board's agenda setting power requires a level of organization which is seldom seen empirically. On the other hand, school boards have the resources necessary to gather information concerning the budgetary preferences of the electorate and are generally expected to do just that. Thus, the criticisms of the Niskanen model offered by Miller and Moe carry less weight in this setting. Moreover, the use of the Niskanen model in this dissertation does not involve efforts to attribute blame for potentially suboptimal results (real or imagined) in any case. It is hoped that the Niskanen model will provide a useful heuristic device to better understand the dynamics of the tax referendum setting. Given the Miller-Moe critique, the Niskanen model may be more appropriate to this task and to this environment in general than to the purposes for which it was originally designed.

Saying that the assumption of low levels of sophistication on the part of the monopsonist is more plausible in the tax referendum setting does not imply that an absolute pronouncement can be made even here. Despite all obstacles, there are rare cases in which low demand

groups within the electorate have been able to organize effective campaigns against taxation proposals. As Coleman[1957] reported, the presence of organized opposition during tax elections tends to decrease the probability of the passage of a proposal. Such behavior on the part of any subgroup of the electorate indicates a sophisticated understanding of the bargaining game, however modest. Moreover, the fact that school board members seldom campaign on the basis of tax policy may have implications for any claim that they possess high levels of sophistication. If they do not ordinarily attend to matters of tax policy we can hardly expect them to be experts on these matters. This possible lack of expertise might lead to more cautious behavior on their part, or, alternately, mismanagement of the tax proposal campaign. Either case would tend to bias the outcome toward the preferences of the electorate.

If the concept of sophistication is to be meaningfully applied to tax referenda it must be dealt with in relative terms. The Niskanen model attributes all sophistication to the monopoly supplier in the bargaining game. Even if this proves to be mostly true, the possibility that some level of sophistication is manifest in the behavior of the monopsonist could lead to outcomes at variance with the Niskanen predicted result. Similar, if not greater, variation should be seen if the behavior of the monopoly supplier demonstrates less than perfect sophistication. Thus, the Niskanen model should be regarded as a `polar' type. The results predicted there define one pole of a range of possible outcomes. If the median voter result is predicted when the potential influence of the monopoly supplier is excluded from the model, this result defines the alternate pole of the

bargaining range. A greater level of sophistication on the part of one group relative to the other should bias the outcome toward the interests of that group within this limited range.

Managing Risk and Reversion

Keeping in mind that the Niskanen model does not exclude the effects of the preferences of the monopsonist, these effects must carry over in its application to the tax decision setting. In most tax referenda these preferences are best represented by the demand curve of the median voter. There are two exceptions to this generalization: Nebraska requires a 55% majority for all levies over 12 mills; and, Washington requires a 60% majority for levies over 7 mills. While the institutional differences in these two states change the location of the crucial swing-voter and thereby shift the bargaining range downward, the essential structure of the Niskanen model does not change. The Niskanen predicted result remains the highest levy capable of being supported by the swing-voter.

The Niskanen model locates its predicted result through reference to the allocation level given if the monopoly supplier's proposal fails. In his original statement of the model Niskanen assumes that this reversion level is `zero'. That is to say that, the bureau makes its budget proposal to the legislature on an all-or-nothing basis. He further assumes that the bureau's proposal will fail if and only if the swing-voter <u>strictly prefers</u> `nothing'. Thus, the Niskanen predicted result is that point in the swing-voter's demand curve at which the voter is indifferent with respect to the choice between the

proposed allocation and no provision at all. Given single-peakedness, this is a unique point. Even allowing for the cases of Nebraska and Washington, there are several institutional considerations which must modify this basic model in application to the tax referendum setting.

With respect to educational finance the relevant reversion level is never actually `zero'. Every state in the union receives some appropriation of revenue for public instruction from the federal government. Moreover, most states provide some additional revenue for the provision of public education from sources other than earmarked property taxes (usually sales and income taxes). In those states which use tax referenda to assess property taxes for public education the percentage of the total school district revenue derived in this fashion varies from a low of 16% in Delaware to a high of 80% in Nebraska. While it is clear that a levy proposal failure in a state such as Michigan (where the average school district derives 58% of its total revenue from local property taxes) could be devastating -even to the point of closing schools- the fact that a substantial portion of the district's operating budget is provided without voter approval should significantly alter the location of the Niskanen predicted result.

This situation is further complicated by the fact that voters may not be able to fully appreciate the relative value or amount of non-matching grants from other sources in making a tax voting decision. Often the impact of non-property tax funding sources is underestimated. Thus, voters may assume that the failure to pass a tax proposal will have more dire consequences than is actually the case (an assumption with is encouraged by most school boards). This failure

to perceive the effect of outside funding sources makes the task of estimations based upon the reversion level difficult and uncertain. The situation was first discussed in Gramlich and Galper[1973] and labeled the `flypaper effect´ by Courant et al.[1979]. Since these initial studies several authors have attempted to develop means to estimate the magnitude of the effect (e.g., Oates[1979], Fisher[1982], Fossett[1983] and, particularly, Romer and Rosenthal[1980]), but to date no reliable method has been demonstrated.

Other institutional characteristics may further complicate the location of the Niskanen predicted result. Particularly, about half of the states which use tax referenda allow school districts to maintain any successful levy perpetually. This means that once a levy proposal is passed by the voters it never expires and the district is allowed to assess taxes at that level indefinately. The remaining tax referendum states require periodic renewals of all previously passed levies. Some states allow school districts a given level of taxation without voter approval, requiring referenda only when the school board´s proposal exceeds this given level. Some states even allow periodic `cost of living´ increases in these base levels. For instance, Colorado school districts may levy up to 106% of the previous year´s base rate without voter approval (see Hamilton and Cohen[1974]). As above, all these factors should influence the location of the reversion level and thereby affect the Niskanen predicted result.

Romer and Rosenthal[1978] present a careful theoretical analysis of the effects of high reversion levels on Niskanen style arguments, particularly with respect to tax referenda. Assuming that the median

voter result is potentially more efficient and socially preferable to the aspirations of a budget-maximizing agenda setter; these authors reach what they call a "seemingly perverse and paradoxical result". They argue that the interests of the polity are better served if the agenda setter is allowed high reversion levels:

> "The reason for this is that, in effect, zero taxes also mean zero expenditure. The setter can then use his monopoly power over the agenda to threaten the voters with facing the consequences of zero expenditure if they fail to approve a high level of expenditure."[p.29]

Thus, as the reversion level approaches zero, the threat potential of the agenda setter is enhanced. On the other hand, those situations in which the reversion level is fairly high allow the electorate to resist the demands of a budget-maximizing agenda setter more effectively.

Romer and Rosenthal's conclusions receive initial support from Neufeld[1977]. Neufeld's study was limited to Michigan school districts; a state with relatively high use of earmarked property taxes and requiring periodic renewal of all levies. These characteristics combine to produce relatively low reversion levels, which, in turn, should make the electorate more favorably disposed toward the proposals of the school board. As expected under the Romer and Rosenthal model, Neufeld found a high correlation between decreases in the reversion level and increases in the percentage of `yes' voters. Similarly, Holcombe[1975] found that millages which passed in the 1972-73 school year in Michigan tended to pass by wider margins than similar cases in other states (the average percentage of `yes' voters in Michigan: 65.3 [p.108]). While results such as these tend to confirm the basic conclusion of Romer and Rosenthal, they do not speak well for the sophistication of Michigan school boards. If

the school board's proposal passes by a wide margin, say greater than 60%, it is likely that an even higher proposal could have passed by a more narrow margin. What, then, is holding these school boards back?

A key component of the concept of sophistication, as presented above, is the management of risk. While it may be true that lower reversion levels provide a school board with a more potent threat, we should not forget that this threat also threatens the school board itself. School board members might not be elected on the basis of their budgetary attitudes, but if these attitudes lead to school closings one could hardly expect such results to enhance reelection chances. In the extreme case, with a zero reversion level, the school board's threat potential may indeed be at its greatest. However, if the school board were to propose the Niskanen predicted level under these conditions it would, in effect, be putting a gun to its own collective head, hoping against hope that the electorate will not pull the trigger. While the failure of a levy proposal under these conditions (i.e., the success of a zero reversion level)is a suboptimal result for all concerned, the real brunt of the failure is borne by the school system and, thus, the school board.

In keeping with the notion of a bargaining range, the reversion level establishes the location of the Niskanen predicted result and, thus, the upper extreme of the range. Low reversion levels yield higher Niskanen results, and thereby provide for larger bargaining ranges. Since the lower extreme of the range is fixed, any increase in the reversion level should contract the bargaining range. Still, the risks to the agenda setter are not constant over different bargaining ranges. As bargaining ranges increase in size, so do these risks.

Increased risks can lead to greater care in the proposing behavior of the agenda setter and, perhaps, bias that behavior away from the upper extreme of the bargaining range.

Serial Bargaining and Multiple Elections

The above discussion has continually referred to the tax referendum setting as a `bargaining' game with a `bargaining' range. Bargaining, of course, involves communication and it is not clear from the foregoing how the various parties communicate with each other. Certainly, school boards might communicate with the electorate through the news media and public hearings of various types. The electorate might communicate their preferences to the school board through public comment, `letters to the editor', and responses to polling questionnaires. Still, the most definitive act of information exchange between these two groups is given in the actual proposition and voting over levy proposals. Herein lies a problem. There seems little room for `bargaining', per se, if the object of the bargaining is contained in the act of communication itself.

Throughout this discussion the single election has been taken as the unit of analysis. Of course, the single election format overlooks the fact that each election is merely a single point in an ongoing interaction between the school board and the electorate. The success of the Niskanen model is predicated upon the assumption that the agenda setter's proposal is regarded as an all-or-nothing, take-it-or-leave-it offer. For the agenda setter's threat to be credible, the monopsonist must regard the proposal as final. If, however, failure to

approve the proposal is immediately greeted by a new lower proposal, the credibility of the threat is lost. Even so,the basic power relationships remain unchanged. Both sides maintain their particular power and neither can unilaterally enforce an outcome. What has changed is that suddenly there is room for bargaining over a series of proposals and votes. What is the expected effect of this bargaining?

The effect of multiple elections on the outcome in tax decision settings has been an important analytic theme since Bowen[1943]. Of course, Bowen regarded the use of a multiple election format as intended to yield the median voter equilibrium. As a result, the idea that multiple elections normally shift the final outcome toward the median voter result is common in the public finance literature. The studies of Neufeld and Holcombe, while giving due consideration to the preferences of the school board and other institutional factors, end up uncritically accepting the assumption that any multiple election format will ultimately produce the median preferred alternative. Only Ladha et al.[1982] seriously attempt to test this notion empirically.

The Ladha study uses a sample of 111 Oregon school districts which held budget elections in 1971. Of these, 69 budget proposals passed on the first try, 25 passed on the second try, 13 on the third, and 4 districts used a total of four elections to finally pass a budget proposal. The authors expected to see a drawn out bargaining process. Assuming that a school board would offer a potentially high proposal in order to `test the waters´, the board would then allow itself to be `bargained´ down (all this while carefully monitoring the proportions of `yes´ and `no´ voters in an effort to estimate the extent to which they would ultimately have to make such concessions). This `learning´

and adjustment effect was not reproduced in a consistent fashion in the data. Of the 42 districts which held a second election, 16 did not change the initial proposal and 3 actually raised it. Of those who lowered the proposal for a second try, 13 lowered it by only a tiny increment (less than 2%). As a result, the statistics on the `learning' effect were not significant.

Despite these results, other evidence tended to support the notion that the bargaining process was simply more complex than was originally assumed. Several cases in the sample showed the absolute number of `no' votes falling even when proposals were unchanged and turnout figures increased between elections. This was taken to mean that "... some voters who initially vote `no' may change their votes as the closing of the schools becomes a more imminent possibility."[p.26]

A school board which allows itself to be `bargained down' may be showing little or no sophistication. By serially adjusting a proposal downward, the school board may actually encourage `no' voters to hold out for a better offer. On the other hand, the use of a multiple election strategy can aid in the gathering of information and, thereby, the control of risk. By gaining a better sense of the preferences of the electorate, the school board's proposal at the next iteration is better informed and the probability of success is enhanced. Where the Ladha group failed was in assuming that the appropriate response to this information was always a lowering of the proposal. In fact, under certain circumstances this may be precisely the wrong response. What must be remembered is that the information gained by the experience of an election becomes common knowledge. Low

demand groups within the electorate may be encouraged by these results. In such cases the reassertion of agenda control and the reliance upon other resources to shift the balance may be the only possible check on the growing confidence of `no' voter groups.

In many tax referendum states the possibility of serial bargaining over a number of elections is constrained by statutory limits on the number of such elections within a given fiscal year. Arkansas and Florida limit their school districts to one election per year. Delaware and New Jersey allow two such elections, and Ohio has a limit of three. Michigan allows a school board to call an election once every six months, but this limit may be exceeded if additional elections are qualified for the ballot through petition drives (Michigan School Code [1955:sec.340.511]). From the point of view of the school board, the Michigan case may present the best combination of possibilities for serial and single election strategies. Here, the `take-it-or-leave-it' threat of the Niskanen model is not wholly abandoned. Nonetheless, there is an escape clause in case of emergency.

In sum, the possibility of serial bargaining over several elections complicates any model of the tax referendum setting. In comparison to the original Niskanen model, the agenda setter's threat potential is somewhat curtailed. However, so are the risks associated with an aggressive use of agenda control. We might expect more elaborate bargaining strategies and a share of experimentation under a multiple election format. This should contribute to greater variance within the bargaining range. Still, the notion of a bargaining range as established by the poles of the Niskanen and Bowen results remains

intact. There seems no reason to conclude that the presence of multiple elections is sufficient to insure the median voter result.

Managing Turnout

In discussing the possible responses to an initial failure of a levy proposal above it was noted that lowering the proposal might not be appropriate and that other resources might be used to change the outcome of a subsequent vote. Perhaps the most highly valued resource available to the school board is given in the actual management of who votes and who does not. Even a casual perusal of the literature available to professional educators and school administrators leaves the impression that voter turnout is a key factor in the successful management of a levy campaign. Tax elections are seldom held concurrently with other elections. Their isolation tends to lead to lower turnout for these elections than for other types of referenda. Piele and Hall[1973] note that normal turnout for school tax referenda is about 25% of the electorate -about half what is expected in national elections.[p.55] Far from being disappointed, educational practitioners applaud these low figures. Several articles in trade journals champion the notion that lower turnout means higher proportions of `yes' voters (e.g., Crosby[1963], Harrington[1959], and Hanson[1969]).

The veracity of this piece of conventional wisdom is well supported by a barrage of empirical studies on the matter. Piele and Hall cite no fewer than fifteen separate studies which show a statistically significant relationship between low turnout and favorable voting in

school finance elections.[p.64] What is so striking about these results is the fact that this conclusion has been reached in a wide variety of empirical settings with several different models and measurement techniques. While it is true that some studies have found no significant relationship between turnout and favorable voting (e.g., Stone[1965] and Hahn[1968]), these are distinctly in the minority. The relationship appears to be quite robust.

The importance of this relationship not withstanding, consideration of turnout is conspicuous by virtue of its absence in the public finance literature. One likely explanation of this neglect harkens back to the original notions of Wicksell and Lindahl. The linkage between taxation and public goods allocation depends on an absolute identity between voters and public goods consumers. The necessity of this identity led these authors to advocate a unanimous decision rule. The impracticality of this rule led Bowen to relax it to a simple majority, but the identity in question is partially preserved in the Bowen model by the assumption of 100% turnout. Barr and Davis[1966], Barlow[1970], Borcherding and Deacon[1972] and Bergstrom and Goodman [1973], all share the `everybody votes´ assumption. Inman[1978] is virtually unique in the attempt to include turnout effects in his model.

It is not the case that these scholars are unaware of the characteristically low turnout of local tax referenda. Rather, they seem to regard it as a trivial detail to be explained away. Holcombe acknowledges low turnout, but argues: "If the voters who cast ballots are an unbiased sample of the population of registered voters, then the ballots of the sample can be considered representative of the

population."[1975:53] Thus, Holcombe justifies his use of the `everybody votes' assumption as a useful fiction. It is particularly important to his model that he do so. Holcombe estimates median demand on the basis of the closeness of the election. All other things being equal, if the election is close,the results should reflect the preferences of the median voter. If this median voter is also the median taxpayer, then all properties of the Bowen equilibrium maintain. Unfortunately, the evidence presented by Piele and Hall suggests that this final identity may not hold. In the face of this possibility, Holcombe's estimates are questionable at best.

Assuming for the moment that the conventional wisdom which posits a relationship between low turnout and favorable voting is valid, the question remains as to why this should be so. In the past half century political scientists have proposed several explanations of why some people vote and others do not. A variety of attitudinal and socio-economic factors such as education, age, income, sense of duty, efficacy, and costs of voting are included in these various models. Still, the narrow focus and unidimensionality of school tax referenda may provide for a more simplified understanding of turnout in this environment.

Piele and Hall suggest such a simplified model based on the concept of a `normal vote' (see Converse et al.[1961] and Campbell et al. [1966]). Included in the group identified as "normal participants" in school finance elections are owners of extensive property, parents of school aged children, civic elites, and high interest groups such as educators. A crucial factor which separates "normal participants" from infrequent or nonparticipants is the intensity of their preferences

with respect to the outcome of the referendum. Piele and Hall's notion of intensity boils down to a simple, individual level cost/benefit calculation. In effect, as the absolute value of the difference between the costs and benefits of providing public education at some proposed level approach infinity, the probability of voting approaches one. Thus, "normal participants" tend to be those who bear significantly high costs or receive relatively high benefits from the provision of public education.

The relative size of `normal' participant groups as opposed to `normal' nonparticipant groups is an important element of the Piele and Hall argument. Given that the `normal' participant groups make up a minority of the general electorate (say, less than 30%), there remains a large pool of nonparticipants whose relative disinterest is, in theory, attributable to little preceived difference between the costs and benefits of the provision of public education at a given level. The asymmetry of size between the participant and nonparticipant groups can be explained in terms of a similar asymmetry in the distribution of costs and benefits throughout the polity.

While a weak case can be made that most members of the polity receive some benefits from the provision of public education, it is clear that the direct benefits of such provision are fairly concentrated amoung such groups as parents of school aged children and professional educators. For the most part, the direct benefits of public education are virtually nonexistent for individuals outside of these groups. Still, these low benefits are matched by relatively low costs. Assuming that the costs of providing public education are fairly evenly distributed throughout the polity, relatively

substantial increases in the basic operating budget of a school system tend to translate into minimal changes in individual assessments once they are absorbed by the mass of taxpayers as a whole.

The asymmetry in the distribution of costs and benefits goes a long way toward explaining the fundamental logic of the relationship between low turnout and the success of taxation proposals. Given that, in general, benefits are fairly concentrated and costs are fairly well distributed, we should expect the `normal' voter group to be dominated by those whose intensity is based upon the perception of relatively high benefits. These, then, are mostly `yes' voters. On the other hand, if the `normal' nonparticipants were somehow forced to participate, it is likely that most would be poorly disposed to increases in tax levies. Their most immediate experience of the costs and benefits of public education is weighted toward the cost side. While their intensity, as measured in absolute values, is relatively small, the basic difference is predominantly negative in most cases. Therefore, the probability of passing a levy proposal is highest when turnout is limited to the `normal vote' group, and tends to decline as regularly low participation groups are brought into the voting population.

If intensity of preference proves to be the crucial factor regulating turnout, and intense groups tend to be more favorably disposed to tax proposals than the electorate as a whole, perhaps the best strategy available to the school board is not to campaign at all. After all, intense groups should more closely monitor the budgetary actions of the school board. Hence, they are likely to know of impending elections and will turnout in greater numbers than the

inattentive public. Any campaigning would just encourage more `no' voters. This is precisely the strategy advocated in Crosby[1963]. Still, there are several reasons why a school board might elect to campaign anyway. First of all, failing to campaign may be illegal. Garber[1962] documents several cases where courts have thrown out the results of underpublicized referenda. Moreover, this approach is a misreading of the basic logic provided by the Piele and Hall design. What matters is not simply low turnout, but the actual make up of the `normal vote' group. It is not low turnout, but selective turnout that makes the difference.

Rubinfeld[1977] illustrates the importance of selective turnout with an empirical example. The study focused on the voters of a single Michigan school district who faced two identical millage proposals in the same year. In the first election the measure was defeated by a modest margin. In the second election the turnout increased, yet the measure passed. Rubinfeld used survey data to identify vote groups in both elections and found that the crucial difference was made in terms of increased participation by women with school aged children. Herein lies the strategic potential given to a school board in the careful management of turnout. This is a factor which transcends all of the institutional conditions so far discussed in this chapter. By successfully managing turnout, a school board can theoretically `stack the deck' in its own favor and shift the location of the median voter up the scale.

All of this, of course, rests on the assumption that the Piele and Hall design accurately describes the forces at work. While the data presented by these authors ably demonstrates the basic asymmetry in

the distribution of costs and benefits, the link between this and the idea of a `normal vote' group is decidedly post hoc. As such, this data does not provide a test of the basic theoretical structure of their design. What remains to be demonstrated is the notion that their concept of intensity is the salient factor in determining the probability of voting in single issue, unidimensional choice settings.

On the testing of theory

In keeping with the stated intentions of this chapter, several key institutional factors which may influence the applicability of some potentially relevant theoretical models have been located and discussed. In general, two types of models appear relevant to the tax referendum environment: median voter models (which emphasize the demand side of school board/voter interaction); and, Niskanen-style models (which emphasize the supply side of that interaction). These two types of models should not be regarded as contradictory. Indeed, there seems adequate reason to believe that the forces described in both may be in play simultaneously in any given empirical case. Nonetheless, both basic models are deterministic in nature and lead to dramatically different predictions. I have argued that the two models should be regarded as polar types and that their expected results establish the extremes of a `bargaining range'. Factors such as the institutional character of agenda control, relative sophistication, serial bargaining, and the management of risk, reversion and turnout, have been offered to explain variance in (and, indeed, the location

of) that bargaining range. Theoretical arguments and empirical evidence have been mashalled to justify the relevance and expected effects of these factors. Nonetheless, these justifications have been presented on a piecemeal basis.

Any adequately specified model of the dynamics of the tax referendum process must pay due heed to the interaction between these factors and the impacts of that interaction upon expectations arising from any subset of them. The task of the next chapter is to outline a research design which will, once implemented, provide the information necessary to specify such a model.

CHAPTER 3

RESEARCH DESIGN, OPERATIONALIZATIONS AND METHODS

A set of hypotheses

The second chapter of this dissertation took the basic design of the median voter model proposed by Bowen and offered a series of modifications which reflect institutional factors relevant to the tax referendum context. Accepting that the original Bowen model depends upon governmental agenda setting to produce its median preferred result, I have argued that these agenda setters are likely to prefer an outcome which sets tax rates at a higher level and that agenda control provides them with leverage to aid in the achievement of such a result. The decision context takes the form of a bilateral monopoly bargaining game with the preferences of the governmental agenda setter pitted against the median preferences of the electorate. This situation is analytically similar to what is assumed by Niskanen in his model of legislative bargaining over bureaucratic budgets.Thus, the Niskanen model was proposed as an alternative to the Bowen model.

Both the Bowen and Niskanen models assume a unidimensional choice space, a majority decision rule, and single-peaked preferences. Both are deterministic in that they predict a unique outcome. Nonetheless, these predictions differ. Their differences can be attributed to the relative emphasis each puts upon the effects of agenda control. I have argued that we need not regard these models as contradictory, nor should we view their deterministic characteristics as absolute.

Rather, the two models should be regarded as polar types. The Niskanen result should be regarded as the expected outcome when the control of the agenda setter is overwelmingly dominant. The absolute absence of the effects of agenda control should yield the Bowen result. Thus, the differing predictions establish a `bargaining range' which exists by virtue of the effects of agenda control. Here stands a testable hypothesis.

HYPOTHESIS 1: Agenda control establishes the possibility of an array of results with extremes at the Bowen and Niskanen predicted alternatives. In the absence of agenda control, this range should collapse to the Bowen predicted result.

Assuming for the moment that existence of the bargaining range is not problematic, additional hypotheses should address the factors which would influence variance within that range. I have argued that the primary factor influencing outcomes within the range is the management of risk, particularly on the part of the agenda setter. Assuming that the agenda setter's preferences correspond to Niskanen's notion of budget maximization, the Niskanen extreme of the bargaining range is calculated by locating the point at which the median voter is indifferent between some proposed expenditure alternative and a `reversion level' which is given at the outset of bargaining. As the reversion level decreases the Niskanen predicted outcome increases. Thus, lower reversion levels provide the agenda setter with greater leverage in gaining higher expenditure levels (as demonstrated empirically by Romer and Rosenthal[1978]). On the other hand, as the difference between the Niskanen predicted outcome and the reversion level increases, so do the risks involved with proposing such a large expenditure level. If the agenda setter's proposal fails, the

resulting reversion level exacts a penalty which is primarily borne by the agenda setter.

I have argued for two factors relevant to the abilities of various `players' within the bargaining game to effectively manage risk. One is a factor which I have broadly labeled `sophistication'. In this setting, sophisticated bargaining on the part of the agenda setter would be manifest in the use of information concerning the preferences and likely behavior of the electorate to structure the strategy of play (both in terms of making the proposal and arguing for it). Sophisticated bargaining on the part of members of the electorate would be manifest in efforts to convince the agenda setter that the `likely behavior' in question will lead to rejection of `excessive' proposals. The use of a threat to enforce the reversion level should lead to a lowering of the agenda setter's proposal. Given that there is a potential for sophisticated behavior on both sides, an hypothesis concerning the effects of sophistication should allow for biases in the outcome which favor the more sophisticated group.

HYPOTHESIS 2: All other things being equal, greater relative sophistication in bargaining, on the part of either electorate groups or the agenda setter, should bias the outcomes within the bargaining range toward that extreme of the range which favors the interests of that group.

A second factor which is relevant to the notion of risk management is the potential for serial bargaining over a series of elections. I have argued that this has the effect of lowering the aggregate risk for all parties. The stakes of any individual decision are less given that a failed proposal does not necessarily enforce the reversion level for good and all. Nonetheless, with risk decreased the relative threat potential of both sides of the bargaining game is similarly

decreased. My expectation is that a multiple election format will lead to greater experimentation and more elaborate strategies. This will contribute to greater variance in outcomes.

HYPOTHESIS 3: The possibility of serial adjustment in bargaining over a series of elections should produce greater variance within the bargaining range than in institutional settings where multiple elections are precluded.

Finally, there is the Piele and Hall hypothesis concerning a `normal vote' interpretation of local tax referenda. If turnout in single issue tax referenda is primarily a function of intensity of preference the strategic potential for the agenda setter in managing turnout may be the single most important element of a sophisticated strategy.

HYPOTHESIS 4: In the tax referendum setting, turnout is primarily a function of intensity of preference. The probability that an individual voter will vote increases as the net personal valuation of the goods and services provided increases.

These are the basic hypotheses of this dissertation. Now I am left with the task of demonstrating how they can be tested.

Operationalizations and Experimentation

In order to test these hypotheses empirically several elements need to be operationalized in definite terms. Since both the Niskanen and Bowen models rely upon the structure of median preference to determine their results, the preference profile of the median voter must be known at the outset before we can determine the size and limits of the `bargaining range' or interpret results with respect to this range. To

a great extent, the empirical work on tax referenda discussed in Chapter 1 can be viewed as little more than efforts to operationalize the concept of median preference.

The technique used by these authors followed a standard form. The concept was operationalized through the a priori specification of various measurement instruments and the relationships between them. Once specified, the authors inserted the data and cranked away. The results of this exercise were subjected to statistical tests from which the authors hoped to judge the value and appropriateness of the hypotheses which guided the research in the first place. However, judgements on these matters are clouded by issues of the adequacy of the initial specifications. Do negative results indicate a failure of the theory to describe empirical reality, or, do they reflect the inadequacy of the operationalization of the theory? If the results tend to confirm the hypotheses, would an alternative specification have done even better? The `trial-and-error' nature of this type of a priori specification provides little basis for the answering of such questions.

The essential element of operationalization is the categorization of a concept. Categorization involves defining the limits of a measurement instrument. We select what portions of empirical reality count as part of the concept and set aside all other aspects of that reality. The discarded portions of reality are assigned to the error term of any theoretical model and are governed by a ceteris paribus clause. In effect, we assume that `all other things are equal' and have no relevance to the problem under study. In fact, we know that this is almost never the case. We hope that `error' is normally

distributed and that things will work themselves out without our ministries. Still, we can seldom be sure of this assumption. Moreover, in light of my critique of the empirical work discussed in Chapter 1, I argue that we can be fairly sure that `all other things' are not equal in most cases.

A central theme of this dissertation is that previous analyses of the tax referendum environment have been misdirected with respect to the ultimate goals of the research and that this misdirection has led to inadequate specification of the various models of this environment. In truth, I have serious doubts as to whether we can ever empirically identify median preference structures in the data used in these studies -at least, not in the absolute terms required by these authors. If we are ever to make meaningful use of the concept of median preference in the tax referendum setting, we must develop a better grasp of the limits of this concept and the nature of its relationship to other factors within the environment. To establish this, we need a research setting in which allows us to have faith in the ceteris paribus clause and in our operationalizations of the key elements in our theoretical models (including notions of median preference).

Controlled experimentation is one research setting which provides reasonable assurance that the ceteris paribus clause is tenable. The use of control groups for comparison and the careful management of the experimental environment provide fairly reliable guarantees that `all other things' are equal. Moreover, the control over the environment afforded by the experimental setting provides the researcher with certain knowledge of crucial factors within the design. Where other

researchers must make heroic assumptions concerning the personal utility functions of various actors, the experimentalist knows these functions precisely by virtue of his or her having designed them in the first place. Because of these attributes, I have chosen to use controlled experimental designs to test the hypotheses listed above. Only after the careful analysis of the results of this experimentation will I attempt to apply the theoretical concepts developed here to a `real world' setting.

A Set of Experimental Designs

The basic design for the testing of my first three hypotheses is partially derived from earlier experimental work on committee decision making, specifically Isaac and Plott[1977] and Eavey and Miller[1982]. Each experiment involved four subjects: three `committee members' who, as a collective monopsonist, were empowered to vote over various alternatives; and, one `convener' who had no formal vote in any experimental setting. The set of alternatives available for committee choice were given by an abstract continuum of numbers (0 through 110). Preferences over this continuum were generated by means of individual assigned dollar payoff functions. These individual payoff functions were provided to each subject in the form of an easily read, two dimensional graph (see APPENDIX). All payoff functions were single-peaked and varied between individuals. Player number 1, a committee member, was given a payoff graph which designated him or her as a `low demand' voter. This function peaked at the alternative (20) for a payoff of $11.00. The payoff function of Player number 2, the `median

voter', peaked at alternative (50) for a payoff of $13.00. Player number 3 had a peak at alternative (100) for a payoff of $16.00.

This technique of using assigned dollar payoffs to generate preferences has been used in several experimental studies and has been shown to be successful in that subjects do reveal the induced preferences in their nominating and voting behavior (see Fiorina and Plott[1978]). While, obviously, not every member of the committee can receive his or her `ideal' payoff, all players were guaranteed at least $2.00 by their own payoff function. The fourth subject, the `convener', had a payoff function which was increasing throughout the continuum, from $2.00 for alternative (0) to $20.00 for alternative (110). This was done to operationalize Niskanen's notion of budget maximization.

The assymetry of information which undergirds the Niskanen model was operationalized through the distribution of payoff information. The `convener' was provided with complete information on the individual payoff functions of all subjects in the experiment. Committee members received only their own payoff information. Moreover, committee members were not allowed to discuss the actual monetary value of any alternative with other subjects. Thus, their discussion was limited to relative pronouncements of `better' or `worse' when collectively evaluating the alternatives. This was done to further frustrate any efforts to organize a collective strategy in opposition to the `convener', and to enforce reliance upon the convener's special information.

The design included several standard features of this style of collective choice experimentation. Subjects were prohibited from

making any deals to pool individual payoffs and divide the profits equally. Similarly, side-payments between subjects were explicitly prohibited. All discussions between subjects were monitored by a researcher to ensure that these rules were observed. The general subject pool was recruited from the undergraduate population at Michigan State University. Potential subjects were approached in lower division general education courses (primarily social and natural science courses). Care was taken to try to recruit subjects who did not know each other in other contexts, and all subjects were sworn to not reveal the nature of the experiment or their experience to others outside the experimental setting.

In all experiments, the selection of an alternative from the continuum was done under a majority vote of the committee members (i.e., at least two votes of the three). Failure to select an alternative resulted in the default selection of alternative (0), the reversion level. Taken together with the median voter's preference profile, the Niskanen predicted result was located at alternative (90). Thus, the hypothesized `bargaining range' is the interval between alternative (50) and alternative (90), inclusive. Tests of hypotheses with respect to this range, particularly the first and third hypotheses, were afforded by the use of three separate designs which varied institutional rules governing agenda control and the procedures for making proposals.

Under the first set of institutional rules, the convener was given exclusive control of the agenda and the number of formal proposals which were ultimately available for committee approval was limited to one. This is theoretically the most extreme form of agenda control and

was meant to operationalize Niskanen's notion of a `take-it-or-leave-it' offer. Any failure of a majority of the committee to approve the convener's formal proposal meant enforcement of the reversion alternative (0). A second set of institutional rules preserved convener agenda control (i.e., the committee could only vote on alternatives other than `0' which were formally proposed by the convener), but failure to approve any convener proposal did not automatically enforce the reversion alternative. The convener was allowed to make as many or as few formal proposals as he or she wished. The viability of the reversion level was maintained in this set of experiments through a set of adjournment rules. Either the convener alone or a majority of the committee could adjourn the experiment without the passage of an alternative. This would result in the enforcement of the reversion alternative (0). In the final set of institutional rules, the convener could neither propose nor vote on any alternative. The agenda was open to any and only members of the committee. Here the convener's bargaining power was limited to persuasion based on the information asymetry.

Comparisons of the results between experiments using the first and second sets of institutional rules serve to test the third hypothesis defined above, while comparisons of both these results with those under the third set serve to test the first hypothesis. The hypothesis concerning the relative effects of sophistication, however, requires a further modification of the basic design. The concept of sophistication as defined above is context specific. What stands for sophisticated behavior in one environment does not carry over directly to another. Thus, sophistication here must be operationalized to

reflect the conditions of the experimental context rather than the tax referendum environment. Such an operationalization was afforded by the recruitment of a special subject pool. These subjects were graduate students with course work in micro-economics, game theory, or positive political theory in their background. Given this background, these subjects could be assumed to possess the requisite skill and experience to develop and implement a sophisticated strategy in the experimental setting.

To allow for sophistication effects on both sides of the `bargaining range', subjects from the special pool were introduced into the experimental setting to play one of two key positions. In one set of experiments, the `sophisticate' was assigned to the role of the `convener' (Player number 4). In a second set, the `sophisticate' played the role of the median voter (Player number 2). All other subjects in these experiments were taken from the general subject pool and pains were taken to make the inclusion of the `sophisticate' as unobtrusive as possible. While the subjects from the special pool were not ramdomly selected, neither were they true confederates in the style of social pychological experimentation. These subjects received no special instructions. They were not told the purpose of the experiments, and their sole incentive was the same monetary compensation provided to subjects from the general pool in their particular role.

To test the interaction between sophistication and the various institutional arrangements, experiments were run using the special subjects for each set of institutional rules and with `sophisticates' in either the median voter or `convener' role. Thus, the ultimate

experimental design includes nine different sets of experimental results: one set of three institutional designs with a `sophisticate' in the median voter role; one set with no `sophisticates'; and, one set with the `sophisticate' taking the role of the `convener'. In each of these particular experimental settings four actual runs of the experiment were conducted. This provided a total sample of thirty six separate experimental results.

The results of these experiments will be grouped into a three by three matrix of analysis. The dimensions of this matrix are defined by the hypotheses under test. The horizontal dimension, which defines the columns of the matrix, is partitioned by the sophistication conditions in play. The vertical dimension, which defines the rows of the matrix, is partitioned by the operant institutional rules. This grouping will facilitate the testing of the various hypotheses through the use of standard analysis of variance techniques (chiefly, difference of means tests using the F-distribution). These results are reported and discussed in the next chapter of this dissertation.

Testing the Piele and Hall Hypothesis

The final hypothesis suggested above relates to turnout. Turnout characteristics cannot be meaningfully addressed in a small group experimental setting. The basic hypothesis to be tested grows out of the Piele and Hall arguments for a `normal vote' interpretation of turnout in local tax referenda. According to these arguments, those voters who trouble to turnout for such elections do so because they have intense preferences with respect to that single issue addressed

in the election. Those voters who normally do not vote in these elections are not regarded as indifferent with respect to the outcome. Indeed, these nonvoters might have very distinct preferences. However, their preferences are relatively less intense than those of the voting groups. It is argued that most nonvoters tend to be poorly disposed to the passage of tax referenda, while `normal' voters tend to be more favorably disposed to such passage. Thus, the `normal' low turnout in these elections should bias the outcome toward the interests of high demand groups in the electorate.

To model these conditions in an experimental setting requires a relatively large sample design so as to allow for greater variance with respect to intensity of preference. The design used here involved a sample of 207 subjects. The subjects were offered a chance to vote for one of two abstract alternatives, `X' and `Y'. Preferences over the alternatives were generated by an assigned dollar payoff which varied between different groups in the sample. Specifically, subjects were randomly assigned to one of ten groups, each containing roughly 20 subjects. Groups 1 through 6 -or roughly 60% of the sample- received no payoff at all if `Y' were voted in. Their payoffs for a victorious `X' varied from $0.25 to $1.50 in increments of $0.25 between groups. Groups 7 through 10 -or roughly 40% of the sample- were paid only if `Y' was victorious. Their payoffs started at $2.00 for Group 7 and increased by an increment of $1.50 to $6.50 for subjects in Group 10. Of course, the decision rule was a majority of those voting. Since the issue at stake was to be regarded as a public good, victorious subjects were paid regardless of whether or not they voted. The issue of interest in the experiment was not which of the

alternatives won, but, rather, who ultimately voted.

Subjects for the experiment were recruited from a large enrollment introductory political science course at Michigan State University. The course in question was geared to the sophomore level, but was taken by students at virtually any stage of their undergraduate program. Since the course credits were applicable to any of a wide variety of undergraduate majors, the subject pool gave a fairly good cross section of the general student body. Several socio-ecomonic factors which are arguably relevant to turnout research should be fairly constant within this sample. One of these is education. The variation in this factor is institutionally constrained by the requirements of the university. Since Wolfinger and Rosenstone[1980] found that education was the single most important variable in the explanation of turnout in general election data, control of this factor is particularly important to the tests conducted here. Other socio-economic variables, such as personal income and social class membership, may not be so well behaved in the sample. Nonetheless, the assumption of a normal distribution appears quite plausible.

Since the early days of voting research (i.e., since The American Voter[1960]) several attitudinal variables have been proposed and measured in models of voter behavior. Of those which relate to models of turnout, notions of efficacy, partisanship, and duty have figured prominently. Thus, this study of turnout attempted to tap these variables within the sample. To do so, each member of the sample completed a questionnaire. Included in this questionnaire were the standard questions designed by the Survey Research Center of the Inter-University Consortium for Political Research to measure these

variables (see APPENDIX for questionnaire). The data from these questions were assembled into the standard indices. In addition to this data, the questionnaire contained questions with respect to the distance the subject lived from campus, the subjects primary means of transportation to campus, and the number of classes the subject had on Fridays. Since the actual voting was scheduled on a Friday at a location in the center of the campus, these questions were meant to provide some information concerning the individual costs of voting. A final question inquired as to the subjects past play of the state lottery. This was included to provide a crude measure of willingness to accept risks.

Once the election was held, information on the turnout of individual subjects was coded in machine readable form along with the data supplied by the questionnaire. Initial analysis of the relationships between the various independent variables and the dependent variable, turnout, was done using simple bivariate crosstabulation technique. This approach provides summary information and several useful statistics which may serve as a general guide to interpreting the relevance of each of the independent variables as predictors of the dependent variable. Even so, a multivariate technique which allows for analysis of the simultaneous effects of the independent variables is called for here. Given the complexity of the environment, ordinal analysis using crosstabulation would prove unwieldy. A common alternative would be the use of Ordinary Least Squares estimation via a linear regression technique. However, the non-interval measurement of the dependent variable precludes such an approach.

The dependent variable, turnout, was coded as a binary; (0) for

nonvoters and (1) for voters. The use of a binary endogenous variable presents problems for analysis using OLS regression techniques. In particular, the Gauss-Markov assumption of homoskedasticity becomes untenable in that error variance is dependent upon values of the exogenous variables (see Pindyck and Rubinfeld[1981:276]). As a result of this failure, estimates using the linear model will be both biased and inefficient. If this were the only problem encountered here, several generalized least squares techniques might be applied to correct for it. However, the source of the problem is in the dichotomous nature of the dependent variable. In theory we have a true dichotomy, yet any linear estimation technique will treat this variable as if it were continuous. In so doing, such techniques render the theorized [0,1] interval meaningless. The theorized relationship is , itself, nonlinear. Thus, to specify this relationship as a linear function is the most substantial violation of the assumptions of linear analysis. Clearly, a nonlinear technique which provides for a transformation of the data such that estimates are bounded by the [0,1] interval is required.

One technique which is particularly appropriate to the problem at hand is Probit. The logic of the Probit technique applied to this setting is fairly straight forward. We assume at the outset that an individual will vote if the expected utility of doing so is "high enough". Determinations of when utility is "high enough" are up to the individual. Nonetheless, we assume that this determination is based upon a theoretical (though unobserved) index: `Ii'. We further assume that the index `Ii' is a linear function of a series of explanatory factors, or, in matrix notation:

$$Ii = Xi'B$$

where: `Xi' denotes a vector of independent explanatory factors; and, `B' denotes a vector of weights which are constant across individuals.

Each individual makes the choice between voting and not voting by comparing the value of `Ii' to a threshold level, say, `Ii*', so that if `Ii' is greater than or equal to `Ii*', the individual votes. The actual value of `Ii*' for any individual may be based on many factors, but, in the limit, we assume that it is a normally distributed random variable. Based on this assumption, we may calculate the conditional probability of an individual voting (i.e., Ii greater than or equal to Ii*) via transformations based on the cumulative standard normal distribution, or:

$$Pr(\text{voting: } Ii) = F(Ii) = F(Xi'B)$$

where: `F' denotes the value of the cumulative standard normal distribution.

From this theoretical base, a Probit procedure estimates the probability coefficients, the vector `B', attached to a specified set of independent explanatory variables, the matrix `X', using Maximum Likelihood Estimation. Provided that the normality assumption holds, these estimates are unbiased and efficient. Moreover, using them to solve for the estimated individual probabilities of voting yields estimates which are bounded by the interval [0,1]. The coefficient estimates appear to be similar to those generated by OLS regression estimation. However, this similarity is deceptive. As Aldrich and Cnudde point out:

> "...the fact that only an ordinal dependent variable is observed limits and weakens the straightforward interpretation of the coeffecients. For example,...

> "slope" or "b" coefficients cannot be interpreted (as in OLS regression) as the amount of change in the dependent variable for a one-unit change in an independent variable. Or, since the concept of variance is undefined for an ordinally measured variable such as [the] dependent variable, there is no analogue to the "standardized beta" of OLS regression. In fact, since the dependent variable is only ordinally measured, estimates are only unique up to positive linear transformations... Nonetheless one obtains an estimate of the best, weighted linear combination of the independent variables."[1975:580-581]

As a result of these effects, there is uncertainty as to what statistical hypothesis tests are appropriately applied to the individual coefficients. Still, appropriate statistics are available for tests of Probit models taken as a whole and for statistical comparisons between models. Thus, the results reported in the next chapter will rely upon comparisons between models to test the notion that intensity of preference, as measured by the payoff group variable, is the most salient factor in explaining turnout.

CHAPTER 4

EXPERIMENTAL RESULTS

A Guide to Interpretation

In the third chapter of this dissertation a set of hypotheses was outlined and several experimental designs were proposed to test them. In this chapter the results of these experiments will be reported and interpreted. Initially, interpretation will be limited to the theoretical and statistical implications of the experimental results. No immediate attempt will be made to extend inferences from these results directly to the tax referendum setting. Such extentions are not strictly justifiable in any case. The experimental setting is not the `real world' of a tax election, and the experimental designs used here do not contain sufficient controls for external validity to argue that these experiments simulate that `real world'. Nonetheless, the experiments do provide an adequate test of the hypotheses in abstraction. Indeed, given the controls afforded in the experimental setting, if these models do not perform here, it is hard to believe that they will do any better in the `real world'. The analysis reported here will begin with the small group, committee decision making experiments, results and discussion of the large group turnout experiment will follow. The chapter will close with a discussion of the applicability of these results to interpretations of actual tax referenda.

Small Group Experimental Results

The raw outcomes of the thirty six small group experiments are

categorized according to the conditions of the matrix proposed in chapter 3 (see FIGURE 1). At first glance, certain cells stand out as particularly striking.

FIGURE 1
MATRIX OF RESULTS

	COLUMN 1 SOPHISTICATED MEDIAN VOTER	COLUMN 2 NEITHER SOPHISTICATED	COLUMN 3 SOPHISTICATED CONVENER
ROW 1	AI	BI	CI
AGENDA	50, 55	60, 65	90, 90
CONTROL	58, 60	70, 80	100, 100
SINGLE	(55.75)	(68.75)	(95)
PROPOSAL			
ROW 2	DI	EI	FI
AGENDA	50, 50	55, 70	73, 90
CONTROL	56, 65	70, 100	90, 105
MULTIPLE	(55.25)	(73.75)	(89.5)
PROPOSAL			
ROW 3	GI	HI	II
OPEN	50, 50	50, 50	50, 50
AGENDA	50, 60	50, 65	70, 100
MULTIPLE	(52.5)	(53.75)	(67.5)
PROPOSAL			

(##) -indicates cell mean

The cells containing those results which are most consistent with Niskanen-style expectations are Cell C (mean = 95) and Cell F (mean = 89.5). Indeed, the sophisticated conveners achieved an outcome above the `bargaining range' twice out of four experiments in Cell C. As interesting as these results are, they are balanced by the outcomes in Cell A (mean = 55.75) and Cell D (mean = 55.25) which share the institutional conditions of Cell C and Cell F, respectively. Of particular interest are the results in Cell A (50,55,58,60). Here the convener possesses the theoretically strongest form of agenda control -the single `take-it-or-leave-it' offer. By the logic of the Niskanen model, these institutional conditions are the most favorable to the

convener's bargaining position. Nonetheless, the sophisticated middle demand committee members were able to keep the range of outcomes within ten points of their ideal.

Examining the results reported in Cell1A, evidence of the sophistication of the middle demand committee members is manifest in the effective management of risk. The ability to impose a two-point, `take-it-or-leave-it' choice on the committee greatly enhances the agenda setting power of the convener. This notion is essential to the logic of the Niskanen model. Nonetheless, there is always the possibility that the committee will choose to `leave-it'. The payoffs associated with the zero option (the reversion level) were universally low in these experiments. The middle demand committee member received only four dollars for this outcome; the convener received two dollars. While the differences between these payoffs is fairly slight, the balance favors the middle demand committee member. By definition, the Niskanen predicted result is the point at which the middle demand individual is indifferent between the proposal and the reversion level. In effect, conveners who make such proposals are asking the middle demand voter discount their voting authority while, at the same time, providing this voter with the means to punish them for this affront. While the middle demand voters in these experiments were not provided with information concerning the convener's payoffs, they certainly knew their own payoffs. Given these institutional rules, there are no risks associated with a threat to enforce the zero option in the face of the possibility of a Niskanen convener proposal.

Notes taken of the discussion during and after each experiment reveal how the sophisticated middle demand committee members developed

and employed their bargaining strategies. In all cases, these subjects recognized that their ability to overcome the convener's absolute agenda control was keyed to their ability to enforce the zero option. By threatening this result repeatedly during discussions of the alternatives, these subjects were able to gain concessions from the convener. In one case reported in Cell A, the middle demand voter doggedly refused to consider any option above `50', the middle demand ideal point. This persistence was rewarded, though not until after a prolonged period of haggling. The convener finally and absolutely gave in; proposing the ultimate outcome of `50'.

Clearly, the ability to enforce the zero option provided the middle demand committee members with a potent threat. Even so, the discussion notes reveal that, if the convener anticipates this threat at the outset, there exists a viable counterstrategy. The potency of the threat is keyed to the ability of the middle demand voter to `punish' the convener. To undercut the threat, the convener must convince the committee that the zero option is a personally acceptable alternative and, thus, does not punish the convener. This was done by falsely portraying the convener's own preferences as `dual-peaked'. In every case reported in COLUMN 3, the sophisticated conveners, at one point or another during the experiment, made such a claim. When pressed for more specific information, these subjects usually discribed their payoff function as `U-shaped' with one peak at zero and another at `110'. The greatest weakness in this strategy, at least as far as it was employed in these experiments, is the fact that it is a falsehood. If the committee does not believe the convener's revelations, the convener may be forced to make more concessions. Thus, the

credibility of the convener's information must be established.

In order to establish their own credibility, the sophisticated conveners relied upon their special information. In every case reported in COLUMN 3, the convener claimed a special expertise on the basis of this information. In ten out of the twelve cases, this claim was explicitly linked to appeals to the `common good'. While acknowledging that the committee members knew their own preferences, these sophisticated conveners argued that, in lacking the ability to directly compare payoffs for any given alternative, the committee was incapable of arriving at a result which was truly fair to all. Thus, the committee must trust its convener to do what is right.

When these appeals to fairness and the `common good' were coupled with claims that the convener's own preferences were `dual-peaked', the conveners made themselves appear as impartial arbiters. In agenda control situations, the conveners argued that their proposals were fair, based on a careful consideration of all the available information with the notion of collective optimality guiding the analysis. In seven out of the twelve cases reported in COLUMN 3, the convener argued against the Condorcet alternative of `50' by pointing out that it was the middle demand voter's ideal point; thus portraying the middle demand voter as greedy -being willing to sacrifice the `common good' for the sake of self-interest. Moreover, the conveners frequently argued that, since the zero option was personally acceptable, the use of it as a threat was further evidence of the avarice of the median voter; its enforcement would be devastating to the high demand committee member. In situations without agenda control, this strategy proved to be the only one available. Indeed, in

one case reported in CellI, the low demand committee member was so moved by the convener's appeals to collective optimality that she endorsed the high demand committee member's proposal of `100' over the loud protests of the middle demand voter.

The discussion above has focused upon the particular results reported in the matrix. It was presented to illustrate the dynamics of the bargaining in these experiments and to highlight the common strategies used by committee members and conveners. However, such piecemeal evidence is not sufficient to judge the various hypotheses proposed in chapter 3. There is a great deal of variation in the results reported in FIGURE 1. This alone leads me to conclude that the bargaining setting is clearly more complicated than either the Niskanen or Bowen models would allow. Nonetheless, statistical tests of the various hypotheses (using the F-distribution) should shed further light on these matters. The results of these tests are reported in TABLE 4-1.

TABLE 4-1
TESTS BETWEEN ROWS AND COLUMNS
[F(1,22)]

ROW 3 VS. ROW 2: 0.41	ROW 2 VS. ROW 1: 0.002
COLUMN 1 VS. COLUMN 2: 5.98*	COLUMN 3 VS. COLUMN 2: 7.23*

(*) indicates significance at 0.05 or better

The test used in this analysis is commonly called a `test of the difference in means'. The null hypothesis suggests that the true population means are equal. Thus, this hypothesis assumes that the variables which separate the various groups produce no effect, or, alternately, that the samples could be drawn from the same theoretical

population. The F-ratio is calculated by partitioning the sums of squared deviations from the `grand mean'(the mean value of all individual cases included in the test). The nature of these partitions determines the degrees of freedom used in calculating the F-ratio. In the statistics reported in TABLE 4-1, a single partition was used to calculate the F-ratio. For instance, to test the difference in means between ROW 3 and ROW 2, the `within groups' sum of squares was calculated by summing the squared differences between each individual case and its row mean. In effect, this tests the independent effects of the variable which separates the two rows and regards all other sources of variation as irrelevant to the analysis. Thus, the statistics for tests between rows consider only the effects which can be attributed to the institutional differences in the agenda control variable; tests between columns consider only the effects of the sophistication variable.

With respect to the hypotheses proposed in chapter 3, the results reported in TABLE 4-1 are mixed. The first hypotheses, which argues that the absence of agenda control should lead to a significant bias in the outcomes, is tested by the comparison of ROW 3 to ROW 2. Here, the F statistic does not allow us to reject the null hypotheses. Similarly, the third hypothesis, which argues for significant differences between the single proposal and multiple proposals settings, is not supported by the comparison statistics between ROW 2 and ROW 1. Only the statistics relevant to tests of the second hypotheses, the biases resulting from the location of `sophisticated' subjects, allow a rejection of the null hypothesis at 95% confidence.

It should be noted that the statistical tests reported in TABLE 4-1

are, perhaps, the most naive tests of the proposed hypotheses in that they assume no interaction between variables. That is to say that, when testing the hypotheses concerning the effects of agenda control, the potential confounding effects of sophistication are ignored. Of course, the same can be said for tests of the sophistication effects ignoring confounding variations from the institutional variables. There, however, the sophistication effects still proved significant. In sum, these statistics do provide evidence to support the hypotheses concerning the relevance of sophistication, but to dismiss the relevance of the various types of agenda control on the basis of these results may be premature. At the very least, the agenda control variables may influence the nature of the sophistication effect.

To test these notions, a new set of F statistics were calculated on the basis of different partitions of the sums of squares. In these calculations the confounding effects of the variables not under test were eliminated by partitioning the matrix so that these variables were held constant within the test. Thus, the sophistication hypotheses was tested by comparing cell means within each separate row of the matrix. Similarly, the possibility of any independent effect of the agenda control variables was tested by comparisons of cell means within each separate column of the matrix (thus holding the sophistication conditions constant). The results of these calculations are reported in TABLE 4-2.

TABLE 4-2
TESTS WITHIN ROWS AND COLUMNS
[F(2,9)]

ROW 1: 38.30**	ROW 2: 6.11*	ROW 3: 1.30
COLUMN 1: 0.39	COLUMN 2: 2.68	COLUMN 3: 3.33

(*) indicates significance at .05 or better
(**) indicates significance at .01 or better

Taking each row of the matrix as a whole and comparing the cell means, the null hypotheses can be rejected with at least 95% confidence in ROW 1 and ROW 2. Here, sophistication appears to have produced significant effects. The null hypothesis cannot be rejected at this level of significance from the F statistic reported for ROW 3. Itshould be noted that the experiments in this row of the matrix employed an open agenda and that the results reported within the row appear to be heavily weighted toward the Condorcet alternative, `50'. Other experimental work (e.g., Fiorina and Plott[1978] and Berl et al. [1976]) has repeatedly confirmed the predictive power of the Condorcet winner under similar circumstances. These results add to that confirmation and further illuminate the relative importance of the institutional condition to the success of the sophistication effect proposed here.

For the first time in this analysis, the hypothesized effects of sophistication have failed to be significant. This failure can be directly attributed to the absence of agenda control in ROW 3. Thus, the pattern established in the statistics reported in TABLE 4-2 is consistent with the notion that the institutional variables are relevant to the outcome. That relevance corresponds to the role of a prior specifying condition of the sophistication effect. Nonetheless,

the notion of an independent significance for the institutional variables is again not supported; the F statistics within the columns of the matrix are universally insignificant at the .05 level. Accepting that these variables are important as a specifying factor to the primary effects of sophistication, further analysis can unlock the nature of this specification effect. Another series of F tests performed between specific cells within each row reveal a pronounced pattern within the data. Using the central column as a control comparisons of cell means were made between adjacent cells. These statistics are reported in TABLE 4-3.

TABLE 4-3
TESTS WITHIN ROWS BETWEEN ADJACENT CELLS
[F(1,6)]

CELLS A and B: 7.35*	CELLS B and C: 25.94**
CELLS D and E: 3.37	CELLS E and F: 1.88
CELLS G and H: 0.08	CELLS H and I: 1.23

(*) indicates significance at .05 or better
(**) indicates significance at .01 or better

In the statistics reported in TABLE 4-3, the null hypothesis can be rejected with 95% confidence between adjacent cells in ROW 1 only. It is here that agenda control is employed in its theoretically strongest form. Relaxing the agenda setting power of the convener to allow for multiple proposals in ROW 2, the null hypotheses can be rejected with 95% confidence for the row as a whole, but not between adjacent cells within the row. Here, for the first time in this analysis, is evidence that the possibility of multiple proposals may have a specifying effect upon sophistication. This would support the third hypothesis proposed in chapter 3. Of course, nothing proved statistically significant from the tests performed on ROW 3.

Taking the results reported in TABLE 4-2 and TABLE 4-3 together, a pattern of interaction becomes clear. As we move upward through the matrix, the relationship between sophistication and its hypothesized effects tends to increase in strength. While all of this tends to support arguments for the relevance of agenda control and multiple proposals (as hypothesized), this support is, nonetheless, indirect. I have yet to provide direct evidence to confirm the initial hypotheses with respect to these factors. Such evidence, however, can be provided. The hypothesis tests reported in TABLE 4-1 assumed no interaction between the variables which structure the dimensions of the matrix. The results reported in TABLE 4-2 and TABLE 4-3 indicate that this assumption is untenable. Assuming that such interactions do affect the outcomes, a more appropriate set of statistical tests can be performed. Such tests are known as `multiple comparisons' tests. In using these techniques, the `within groups' sum of squares is calculated using partitions which reflect the effects of several variables simultaneously. In this case, for instance, to test the difference in means between ROW 3 and ROW 2, the `within groups' sum of squares is calculated by summing the squared differnces between each individual case and its cell mean. The results of `multiple comparisons' tests on the hypotheses are reported in TABLE 4-4.

TABLE 4-4
MULTIPLE COMPARISONS BETWEEN ROWS AND COLUMNS
[F(5,18)]

ROW 3 VS. ROW 2: 2.98*	ROW 2 VS. ROW 1: 9.48**
COLUMN 1 VS. COLUMN 2: 3.32*	COLUMN 3 VS. COLUMN 2: 4.45**

(*) indicates significance at .05 or better
(**) indicates significance at .01 or better

The results reported in TABLE 4-4 do provide support for the hypothesized relevance of agenda control and multiple proposals. Still, it is important to note that they do so only in terms of interactions with the sophistication variable. Taking the four tables of statistics together, the primary effect, which has maintained throughout these analyses, is the sophistication effect. The agenda control and multiple proposal variables are relevant in that they act as prior specifying conditions for this effect. Another way of putting this would be to say that their relevance is on the order of the old adage that `you cannot make bricks without straw'. Without the power of agenda control, a sophisticated convener is hard put to defeat the Condorcet alternative. Without a sophisticated convener, the power of agenda control -even given the single proposal setting- cannot guarantee the Niskanen predicted result. Moreover, given a sophisticated middle demand voter, these same conditions can be turned as tools against the convener.

Testing the Piele and Hall Hypothesis

The actual turnout for the Piele and Hall experiment was 16.9% of the sample, or 35 out of 207 subjects. Data concerning the independent characteristics of the subject pool were coded and organized into nine variables:

BENI - membership in a particular payoff group
(0 = 0.25, 1 = 0.50, 2 = 0.75, 3 = 1.00, 4 = 1.25, 5 = 1.50, 6 = 2.00, 7 = 3.50, 8 = 5.00, 9 = 6.50)

PID - party identification
(1 = Republican, 2 = Independent, 3 = Democrat)

PART - partisanship strength index
(1 = strong Republican, 2 = Republican, 3 = Independent, 4 = Democrat, 5 = strong Democrat)

EXEFF - index of external efficacy
(1 = very high, 2 = high, 3 = medium, 4 = low, 5 = very low)

DUTY - index of sense of citizen duty
(1 = very high, 2 = high, 3 = medium, 4 = low, 5 = very low)

DIST - distance subject lived from campus [a `cost´ variable]
(1 = over 5 miles, 2 = 2 to 5 miles, 3 = less than 2 miles, 4 = on campus resident)

TRANS - primary means of transportation to class [a `cost´ variable]
(1 = car, 2 = bus, 3 = bicycle, 4 = walk)

CLASS - number of other classes subject had on fridays [a `cost´ variable]
(1 = 2 or more, 2 = 1 class, 3 = none)

RISK - frequency of play on the state lottery
(1 = regularly, 2 = occasionally, 3 = never)

Once the data was coded, a series of bivariate crosstabulations between each of the independent variables and the turnout variable were run. TABLE 4-5 reports summary statistics for each of these crosstabulations. Chi square is used as a measure association and Kendall´s tau `c´ is used as a measure of strength and direction.

TABLE 4-5
SUMMARY STATISTICS FOR CROSSTABULATIONS

IND. VAR.=	BENI	PID	PART
CHI SQUARE=	19.05*	0.39	2.10
df=	9	2	4
TAU `C´=	.20*	-.03	-.05
IND. VAR.=	**EXEFF**	**DUTY**	**DIST**
CHI SQUARE=	3.40	4.31	5.13
df=	4	4	3
TAU `C´=	-.05	.03	.05
IND. VAR=	**TRANS**	**CLASS**	**RISK**
CHI SQUARE=	1.99	0.02	2.78
df=	3	2	2
TAU `C´=	-.06	.00	-.07

(*) indicates significance at .05 or better

The statistics reported in TABLE 4-5 are generally consistent with the hypothesis under test. Of the nine independent variables, only BENI, the variable meant to stand for the induced intensity of preference with respect to the outcome, proves to be significantly related to the turnout variable. While the tau `c´ is fairly low for this crosstabulation, it, too, is significant at .05 or better. Of the other variables, the results of the crosstabulations are mixed. The partisanship variables (PID and PART), while not significantly related to turnout, do behave in a fashion consistent with the turnout research from the American Voter[1960] on; Republicans do vote more often than Democrats. The crosstabulation with DUTY reports a tau `c´ which has a countertheoretical direction. In the case of DUTY, we might doubt the accuracy of measure given a univariate distribution of the variable; 56% of the sample were classed as `very high´, 0% of the sample scored as `very low´. Of the variables, CLASS, a measure of the number of other classes the subject attended on fridays, was the least successful. Indeed, the tau `c´ for this crosstabulation shows no relationship at all. All told, there is little to discuss of the statistics reported in TABLE 4-5 apart from the performance of BENI.

A more thorough analysis of the bivariate relationship between intensity of preference (as measured by membership in a particular payoff group) and turnout is afforded by a serial breakdown of turnout by each group. Such a breakdown is provided in TABLE 4-6. Included in this table are the within group percentages which will make the nature of the trend towards increased turnout through the groups more obvious.

TABLE 4-6
BREAKDOWN OF TURNOUT BY PAYOFF GROUP

GROUP	VOTED	DID NOT VOTE	N
0.25	2 (10.0)	18 (90.0)	20
0.50	2 (9.1)	20 (90.9)	22
0.75	2 (10.5)	17 (89.5)	19
1.00	1 (4.8)	20 (95.2)	21
1.25	2 (10.5)	17 (89.5)	19
1.50	1 (4.5)	21 (95.5)	22
2.00	5 (22.7)	17 (77.3)	22
3.50	8 (38.1)	13 (61.9)	21
5.00	6 (28.6)	15 (71.4)	21
6.50	6 (30.0)	14 (70.0)	20
	35	172	207

(##) indicates within group percentage

The results reported in TABLE 4-6 indicate that the trend toward increased turnout as the payoffs increase is far from smooth. Turnout in the first six groups is fairly constant, averaging 8.1%. Once the payoff increases to $2.00, the within-group turnout leaps to 22.7%. The next increment increse in payoff produces a similar jump in turnout (up to 38.1%), but, thereafter, the percentage turnout declines to a fairly stable level (averaging 29.3%). Thus, the trend established in TABLE 4-6 seems to correspond more to a step function

than a monotone increase. It is interesting that the crucial break in the trend comes at the point at which the payoffs, themselves, take a step increase in value; the increment increases from $0.25 to $0.50, and, thereafter, to $1.50. That the increases in turnout correspond to the increases in the increments which separate the groups is encouraging. However, the decline in turnout in the last two groups leads me to proclaim a perfect correspondence to theory. Nonetheless, the relationship between intensity of preference and turnout (and the absence of such a relationship with the other variables) is, at least, theoretically gratifying.

In keeping with the analysis proposed in chapter 3, multivariate analysis of the predictive power of the various independent variables was done using Probit estimation techniques. The limitations of Probit do not allow for a meaningful interpretation of the significance of Probit coefficients for individual variables. Thus, analysis of the particular significance of groups of independent variables was provided by comparisons between models with different configurations of exogenous variables. Four separate models were actually estimated. The first of these included all the independent variables (choosing the strength of partisanship index in preference to party identification):

MODEL 1: Pr(VOTE) = F(b + bBENI + bPART + bEXEFF + bDUTY + bDIST +...
bTRANS + bCLASS + bRISK + e)

The second model removed the standard Survey Research Center variables related to partisanship and attitudes of efficacy and citizen duty, but retained `cost´, `risk´, and intensity variables:

MODEL 2: Pr(VOTE) = F(b + bBENI + bDIST + bTRANS + bCLASS + bRISK + e)

The third model removed the `cost´ variables, but retained the `risk´

and intensity variables:

MODEL 3: Pr(VOTE) = F(b + bBENI + bRISK + e)

Finally, a model was run using just the intensity variable:

MODEL 4: Pr(VOTE) = F(b + bBENI + e)

A standard test of the overall significance of a Probit model is afforded by the calculation of -2.0 times the log of the likelihood ratio provided by the model. This statistic distributes as a Chi Square with (K - 1) degrees of freedom, and can be interpreted as such. The results of these calculations are reported in TABLE 4-7.

TABLE 4-7
CHI SQUARES FOR PROBIT MODELS

MODEL 1:	MODEL 2:
19.39*	17.69**
df = 8	df = 5
MODEL 3:	**MODEL 4:**
15.57***	11.46***
df = 2	df = 1

(*) indicates significance at .05 or better
(**) indicates significance at .01 or better
(***) indicates significance at .001 or better

While all of the models estimated prove significant at .05 or better, it is interesting to note that none prove more significant than MODEL 4. Given the results of the bivariate crosstabulations, it is reasonable to assume that BENI is the primary factor which maintains the significance across the models. Indeed, given the general decline in significance as variables are added to the equation, it appears that the additional variables do little more than increase the aggregate noise in the system. Still, better means of comparing the models should be discussed before passing judgement on their relative predictive power. One such technique involves a case by case analysis of correct versus incorrect predictions generated by

each model. The models are then compared through calculations of rank correlations between actual and predicted values of the dependent variable.

In performing this analysis, the low turnout within the sample (16.9%) creates problems for the predictive power of the dichotomous Probit package used to estimate the models. Since the dependent variable is a strict dichotomy, a case is normally predicted to vote if the probability of doing so exceeds .5 (based on combined additive effect of the various variables in the model). However, the estimations of these probabilities are derived from maximum likelihood estimations of the fit to the variation within the dependent variable. The low turnout of subjects in the experiment produced so little variation in the dependent variable that individual predictions were systematically skewed toward not voting. In order to overcome this skew, a Baysian adjustment was made to force the models to predict the distribution of voters to nonvoters in roughly equal proportions to the actual distribution in the turnout variable. Such adjustments are common when using Probit and Discriminant Functions analysis techniques, and have the effect of shifting the probability curve toward the origin in the same manner as one might force an OLS regression line through the origin. Having made such an adjustment, crosstabulations of actual versus predicted values of the turnout variable were generated and a Goodman and Kruskal's tau was calculated as an asymmetric measure of rank correlation. These results are reported in TABLE 4-8.

TABLE 4-8
ACTUAL VS. PREDICTED TURNOUT FOR ALL MODELS

MODEL 1:

	PREDICTED VOTE	PREDICTED NOT VOTE
ACTUAL VOTE:	10	25
NOT VOTE:	21	151
	31	176

TAU: .030

MODEL 2:

	PREDICTED VOTE	PREDICTED NOT VOTE
ACTUAL VOTE:	9	26
NOT VOTE:	21	151
	30	177

TAU: .021

MODEL 3:

	PREDICTED VOTE	PREDICTED NOT VOTE
ACTUAL VOTE:	10	25
NOT VOTE:	22	150
	32	176

TAU: .027

MODEL 4:

	PREDICTED VOTE	PREDICTED NOT VOTE
ACTUAL VOTE:	12	23
NOT VOTE:	29	143
	41	166

TAU: .027

What stands out most about the results reported in TABLE 4-8 is the lack of differences between the four models. This is rivaled only by the generally low tau statistics. The interpretation of these results, taken together with those reported earlier, is both straightforward and inconclusive on various levels. On the straightforward side, it can be said that the payoff variable is a significant factor in accounting for turnout. Thus, there is support provided for the hypothesis under test. Nonetheless, the Probit analysis indicates that a substantial amount of the variance in turnout is not explained by the payoff variable or any other variable measured in the experiment. This may be the fault of the design of the measurement instruments or it may indicate that other factors, which remain unmeasured, are at work. In either case, while these results do provide some support for the Piele and Hall hypothesis, the evidence here does not lead to the type of certainty that was hoped for at the outset.

Application to the `Real World'

The weak case provided for the Piele and Hall hypothesis by the experimental results might be aided by additional evidence taken from the strategies and behaviors of actual organizers in a tax referendum. If the proof of the `pudding' is in the `eating', perhaps the best evidence of the relevance of intensity of preference to the management of turnout is in `real world' examples of its use. This is, in fact, the aim of the next and final chapter of this dissertation. There, too, the results of the small group experiments will be applied in interpreting the dynamics of an actual referendum campaign. Just as sophistication proved of primary importance in the experimental results, so too its importance can be demonstrated in the playing out of actual strategies in the `real world' setting. The components of a sophisticated strategy will be different between the two environments. This is expected given the context specific nature of the concept of sophistication. Nonetheless, there exist several ploys and stratagems which have analogous roles between the two environments. These parallels will be addressed, as will the immediate relevance of the analytic models themselves, in the next chapter.

CHAPTER 5

MAKING SENSE OUT OF ACTUAL TAX REFERENDA

In chapter 4 of this dissertation the results of several series of experiments designed to test the hypotheses proposed in chapter 3 were reported and discussed. So far, interpretations of these results have been limited to discussions of their implications in terms of the theoretical expectations given in the experimental setting. Nonetheless, the ultimate purpose of both the hypotheses and the experiments is to provide a basis for the interpretation of `real world' tax referenda. To this end, this chapter will present an analysis of an actual tax referendum. The election was held on September 2, 1980 in Chippewa County, Michigan (Saute Ste. Marie area). The issue included two separate proposals of millage taxation to finance the operation of the local public schools. The history of events leading up to September 2nd, the design and implementation of campaign strategies on the part of the school board, and the actual results and outcome of the referenda, will be the subject matter to be interpreted here. It is in this interpretation that the relevance of the experimental results must be established.

The small group experiments provide a plausible case for the salience of agenda control, multiple elections and sophistication in the performance of the theoretical models in abstraction. In applying the Niskanen and Bowen models to the `real world' setting, we must, at least, be mindful of the possible effects of these factors. Moreover, the strategies observed in the experimental setting may have certain analogues in the behavior of actors in actual tax referenda. Still, a

direct extention of the experimental results to the `real world´ is neither methodologically justified nor possible. Thus, care must be taken to define the factors -particularly `sophistication´- in context specific terms before they can be applied in this case study.

The evidence presented in the Piele and Hall experiment presents a relatively weaker case in support of the notion that turnout management may be a crucial factor affecting the outcomes of actual tax referenda. Nonetheless, the discussion presented here will argue that this factor, coupled with sophistication, may prove to be the most important strategic asset available to a governmental agenda setter in such environments. It is important to note that the salience of turnout management will be discussed in tandem with sophistication. Given the small group experimental results, the same can be said for the salience of multiple elections and agenda control. Sophistication appears to be the glue that holds all these hypotheses together. With that in mind, this chapter will begin with a discussion of the meaning of sophistication in the tax referendum setting.

What does sophistication mean?

In the experimental setting, sophistication was operationalized in terms of familiarity and experience with abstract analytic systems and gaming environments similar to those used in the experimental design. At that time, it was argued that sophistication is a context specific concept. What stands for sophisticated behavior in the experiments does not carry over into other environments. While the behavior manifest by the sophisticates in these experiments tended to support the operationalization of the concept in that environment, it cannot

be said that these `sophisticates' would fare equally well in the tax referendum setting. How, then, should sophistication be defined in this case study?

A straightforward transposition of sophistication between the two environments might define the concept as familiarity and experience with the management of tax election campaigns. Nonetheless, most tax election campaigns are managed directly by local school boards or administrations. As important as the results of these elections may be to the wellbeing and success of these agencies, campaign management is secondary to the primary tasks of setting and administering policy for the schools. Thus, despite their experience, these actors tend to remain relative amateurs when it comes to the intricacies of political campaign management. On the other hand, a tax referendum is a fairly unique campaign setting. It does not immediately follow that professional campaign managers, who work for the election of candidates and party slates, would have the requisite experience to design and implement a sophisticated strategy in a tax election. Such experience may, indeed, be helpful, but it is not sufficient to define the concept of sophistication.

When it comes to the conditions of actual tax elections, perhaps the best way to develop an understanding of the concept of sophistication is in terms of the actual strategies implemented by various actors. In these terms, analogies between the experimental setting and the `real world' can be drawn. For instance, the `sophisticated' conveners in the small group experiments designed and implemented their respective strategies through the careful analysis and use of their `special information' concerning the distribution of preferences within the

committee. Evidence of sophistication in the management of actual tax elections should start with a similar analysis of the distribution of preferences within the electorate. Without such knowledge at the outset, it would be difficult to design an effective campaign strategy which makes optimal use of the various resources available to the campaign manager.

As in the Niskanen model, analysis of the distribution of preferences is a key factor in determining `what the traffic will bear´ in terms of actual proposals of different levels of taxation. Moreover, from the basis provided in this analysis, a campaign manager may identify different demand groups within the electorate and design selective appeals for each, or simply choose to ignore certain groups. Here too, effective management of turnout must be based upon knowledge of the distribution of preferences. All these elements will figure into the discussion of sophistication presented here. To illustrate the importance of the gathering and analysis of information concerning electorate preferences, this case study will begin by examining the situation in the Sault district prior to the organization of the September 2nd campaign and then compare past efforts to the plan developed for that particular election.

The background of the Sault campaign

An examination of ten years of tax referenda in the Sault Ste. Marie Area Public School District provides a basis from which to judge the relative sophistication of the local school board in its role as a governmental agenda setter. In the period between June 1971 and September 1980, seventeen separate millage proposals were offered to

the Sault area electorate. All but the September 1980 election were managed in-house by the school board itself. Ten of these seventeen proposals were successfully passed, which, on the surface, seems like a fairly good report card on the electoral skills of the school board. Still, closer examination of this record stands in opposition to such a rosey appraisal.

While Michigan law provides that operational millages for local public schools must be periodically renewed, the period of renewal can be as long as three years. Nonetheless, all but one of the seventeen proposals offered by the Sault Area school board during the 1970's were single year proposals. This requires the school board to come back to the electorate every year; repeatedly taxing the resources of the board. The reasons for going with this single year period are hard to fathom. Indeed, the June elections of 1971, 1972, and 1973 all offered the same levy of 15 mills. If nothing else, a single three year proposal would have been less demanding in terms of campaign resources. With the election of June 1974, the millage proposal was increased to 16 mills. Nonetheless, the proposal of the following June returned with the same 16 mills. Given this, it is unlikely that the school board, in proposing a one mill increase, was `testing the waters' or attempting to develop a more elaborate bargaining strategy with the electorate. Rather, it appears that the board was simply adjusting the old 15 mill proposal for inflation. If the board feared the use of a three year period on the grounds that inflation might have unpredictable effects, the option remains of proposing additional mills at any time within the three years. While Michigan law limits the number of tax referenda per fiscal year to two, this leaves five

opportunities for adjustments within the three year period. Thus, through the first five years of the 1970's, the Sault Area school board seemed to have little grasp of the strategic potential given in their role as agenda setter.

The proposal behavior of the school board goes through a series of changes in the second half of the 1970's. Given cuts in state lump sum grants and subsides in 1976, the June 1976 proposal was raised from the previous budget of 16 mills to 19.3 mills. This dramatic increase was not well recieved by the electorate, which turned down the proposal by a wide margin. Fearing school closings, the board came back with a more modest proposal in August. Michigan law allows a school board to partition its proposals separate ballot issues. So long as all the parts are voted on on the same ballot, the election counts as only one referendum against the statutory limit. The August proposal made use of this by offering two separate issues: 16 mills and 2 mills. The board felt confident that the 16 mill proposal would pass; it was simply a reproposal of the status quo. Thus, the campaign focused on the additional 2 mills. Taken together, the two proposals were less than the original 19.3 mill request. This was argued to be a gesture of good faith bargaining with the electorate. The additional millage was then defended as absolutely necessary given inflation and changes in state funding. The strategy was successful, but, more importantly for this study, it marks the first recognition on the part of the school board of the adversarial nature of its relationship with the electorate.

The school board's increased sensitivity to the strategic characteristics of the tax referendum environment, which was manifest

in the proposing behavior of the 1976 elections, carried over into the the next round of elections. In June 1977, the board again used a two issue proposal, setting the first at the new status quo (18 mills) and seeking another 1 mill in addition as a separate issue. Unlike previous elections, however, the 18 mills were offered as a three year levy. With the uncertain economic climate of 1977, the board felt that setting a sold base for three years would minimize the risks of school closings by limiting bargaining to small increments of additional millage. In keeping with this notion, the 1 mill proposal was offered as a one year levy. In this case, the use of a one year period had some strategic value. The school board was able to portray the 1 mill proposal as a temporary measure necessitated by declines in state funding due to the growing economic recession in Michigan. This strategy appears to have met with some success. While the initial 1 mill proposal failed, a subsequent `bargaining down´ to 0.8 mills passed in August.

Given that the economic conditions in Michigan did not improve, the argument of temporary additional millages ran quite thin. Indeed, progressive declines in state support coupled with a growing sense of economic vulnerability on the part of the electorate had the dual effect of making additional millages more necessary and less likely to pass. Two one year proposals in June 1978 and 1979 failed, leaving the district with an 18 mill operating budget through the bulk of the three year period. Interestingly, these two proposals show a certain amount of strategic planning despite their failures to pass. With a sense of security provided by their 18 mill base budget, and with further declines in state support, the school board showed no

willingness to bargain through a series of elections. The June 1978 proposal of 1.5 mills was not followed by an August attempt, rather, the following June election offered another increase to 2.5 mills. Nonetheless, by early 1980, the board recognized that the margin of safety provided by the three year proposal was coming to an end. It was clear to the board that a new strategy of campaign management was required.

At this point in the narrative the stage has been set for a discussion of the three elections of 1980. It is there that the best case can be made for an analysis of the essential elements of a truly sophisticated strategy in the tax referendum setting. The discussion above illustrates the gradual development of a modicum of sophistication on the part of the Sault Area school board in both their proposing behavior and their ability to exercise and exploit measures designed to contain the risks associated with different proposals. Indeed, the fact that there were three millage elections in 1980 without a petition drive to qualify the third bears witness to this development. Since the fiscal year of the school district runs from June to June, the first election of 1980 was called in March. This election was, therefore, charged to the 1979 - 1980 fiscal year; leaving two opportunities before the expiration of the 18 mill budget. Even so, the type of sophistication demonstrated up until this point was limited to the use of institutional conditions governing agenda control.

In structuring the actual proposals the school board relied on the notion of incremental change from a given status quo. With the elections of 1980, a modest increase beyond the 18 mill base was

precluded by three years of deteriorating economic conditions. The board felt that it would have to pass a minimum 6 mill increase just to meet the basic operating expenses for the next fiscal year. The difference between this strategic situation and those encountered in the past ten years meant another shift in the development of board strategy. Given this, the experiences of the 1980 elections should be discussed separately.

The elections of March and June, 1980

In planning strategy for the March 1980 election there was general consensus within the school board on the necessary size of the proposed levy (24 mills) and the need to use a single issue format for the ballot design. The 24 mill figure was provided by the superintendent, based on the projected budgetary requirements of the district at full operation. The single issue ballot design reflected a general agreement on the type of strategy used to persuade voters. It was felt that the 24 mill levy was a functional minimum, and could be campaigned for as such. Given the superintendent's budgetary projections, nothing less than 24 mills would be sufficient. Moreover, given recent electoral history, partitioning of the levy into separate issues would do little beyond increasing the probability that only a portion of the 24 mill figure would pass. Thus, the decision was made to go with an `all-or-nothing' proposal.

As discussed in chapter 2 of this dissertation, the use of an `all-or-nothing' agenda setting strategy (similar to that which is used in the Niskanen model) increases the level of risk to the agenda setter. This notion was recognized and accepted by the board. While it was

felt that a partitioned proposal would hurt the chances of passing the full 24 mill levy, the board preserved its maximum opportunities for serial bargaining over multiple elections by calling the election within the old fiscal year. Thus, the board hedged its bet; what appeared to be a `take-it-or-leave-it' offer was, in fact, still open to bargaining. In a sense, the board hoped to combine the advantages of the single election format and a multiple election setting.

A related aspect of the board's attempts to manage risk is given in the selection of a one year term for the proposal. While arguments concerning the temporary nature of the school district's fiscal crisis had failed in the past, board members continued to have faith in its effectiveness as a tool of persuasion. The failures of this approach in the past two millage elections were attributed to the relatively passive style in which previous campaigns had been run. With a more aggressive persuasion campaign, the board hoped to make effective use of the `temporary crisis' argument. Before judging these hopes as naive, it should be noted that such arguments were standard political rhetoric in Michigan at that time. The recession of the late 1970's was, after all, a national problem. Moreover, Michigan had been one of the hardest hit states in the union. Cutbacks in state support to public education had been debated and passed in the state legislature as `temporary measures'. This style of argument had not abated despite repeated use over the last few years. Further, there was growing sentiment in the state capitol for a restoration of some of the cutbacks to education (at the expense of the social services budget) if the fiscal crisis persisted.

Clearly, much of the school board's strategy in managing the millage

campaign was keyed to the notion of aggressive persuasion. The board felt that the only way to pass a 24 mill levy would be to convince the electorate that the school district's problems were dire and not solved by partial measures. To do this, the board felt that the standard media were not sufficiently reliable to be trusted to get their message across. Therefore, a plan was developed to supplement the usual media campaign of press releases and canvassing with what amounted to a traveling road show. Approximately two thousand dollars were set aside to develop a multimedia presentation which was to be given at public meetings in various areas of the school district. The presentation included a slide show with a taped narration and a battery of speakers.

The nature of the appeal in this presentation was directly analogous to the arguments used by the `sophisticated' conveners in the small group experimental setting. The presentation stressed the value of the public school system as a public good shared by all of the community. Apart from cataloging the various activities of the public schools, the program went on to stress the importance of a good school system to the community as a whole and to individuals without school aged children. In short, the maintenance of a good public school system was portrayed as a policy which was fair and beneficial to all members of the polity. A consistent theme running through the presentation was the notion that the only way to preserve such a good school system was the passage of this particular 24 mill levy. Nothing less would be fair or socially efficient. This is an analogue to the convener claims of `dual-peaked' preferences in the small group experiments. The school board was essentially arguing that it would prefer a zero

provision to a compromise appropriation below the 24 mill request.

Along with the actual design of this multimedia presentation, a plan was developed for its deployment to particular precincts within the school district. This plan was based upon an examination of the marginal turnout by precinct in the June 1979 election, and marks the first instance in which the turnout factor was taken seriously as an aspect of the board's strategy. However, the strategy that was ultimately implemented showed little grasp of the relevance of turnout in determining the outcome.

Since the multimedia presentation was a persuasion focused campaign, the board chose to emphasize its use in those precincts which had been least favorably disposed to the 1979 millage proposal. The logic behind this approach argued that most `no' votes in the 1979 election were based in ignorance of both the value and fiscal needs of the local school system. If these voters could be shown the truth of the situation, the potential for converting large blocks of them into `yes' voters would turn the tide in favor of the proposal. Even if the precincts ultimately cast a plurality of `no' votes, if the campaign kept that margin small, the `yes' votes in stronger precincts might carry the day.

Several factors point to the potential fallacies in the logic behind the school boards use of the persuasion campaign. First, the board probably over estimated the number of voters who could be persuaded to change their minds from their previous revealed preferences. Since no effort was made to estimate this potential via survey research, the board was building its strategy on what amounted to idle speculation. Also, the precincts which had shown the least support for the 1979

millage proposal were largely in the rural areas of the district. These were sparcely populated. Even a major shift in support in the rural precincts would not generate enough `yes' votes to justify the expense of resources to mount an aggressive campaign there. Since the 1979 millage had gained a plurality of support in only one of the urban precincts, a substantial effort was required to shift the balance in other close urban areas. In the long run, the potential for aggregate vote gain was greater in these areas than in the rural communities. Finally, if the Piele and Hall hypothesis holds, any attempts to mount a high profile publicity campaign in areas know to be poorly disposed to millage proposals are likely to increase both the aggregate turnout in those areas and the turnout of `no' voters in the bargain.

Given the above, the results of the March election reflected the flawed logic of the media campaign. Aggregate turnout declined between the June 1979 election (4219 votes or 36%) and the March 1980 attempt (3978 votes or 35%). The bulk of this decline was experienced in the urban precincts. Since the primary support for the earlier proposal was found in these areas, this had the effect of actually decreasing the raw total of `yes' votes from 1668 in June 1979 to 1639 in March 1980. The only precincts which experienced increases in turnout were in the targeted rural areas. As expected under the logic of the Piele and Hall hypothesis, the majority of this increase went to the `no' vote total. Thus, the final result was a rejection of the proposal by a 695 vote margin.

In assessing the outcome of the March election, the school board was most troubled by the decline total `yes' votes derived from the urban

precincts. In light of this result, it was decided that the mutlimedia campaign should be retargeted to these areas for the June 1980 election. The rural strategy was wholly abandoned. Also, the millage proposal was decreased to 23.6 mills. This would be offered as a good faith effort to bargain with the electorate by cutting the proposed operating budget to a bare subsistance level. In all other aspects, the board's strategy was unchanged from the March campaign.

The results of the June election proved more favorable to school board's position. While the aggregate turnout was essentially unchanged from the March results (4072 votes or slightly more than 35%), turnout within precincts showed increases in the urban areas and decreases in the rural communities. The proposal gained a plurality of support in four of the thirteen precincts within the district (all in urban or suburban areas) and ran dead even in a fifth. The aggregate `yes' vote was increased to 1961, a gain of 322 votes over the March total. Still, despite these improvements, the proposal was defeated by a 150 vote margin.

Designing the September campaign

In light of the June results, the school board was pessimistic with respect to the possibility of ultimately passing a reasonable millage proposal. The failure of the June campaign left them with little time to develop a new strategy before the scheduled start of the new school year. Still, without the passage of a new levy, there would be no new school year. Faced with this dilemma, the school board chose to give over the planning and design of the September campaign directly to the superintendent.

The budgetary preferences of the superintendent were clear from the outset. The 24 mill proposal was, after all, his original design. Moreover, it was felt that the minimal change of the proposal to 23.6 mills in the June election had no effect on the outcome. Thus, the September proposal would return to the 24 mill level. Even so, there was something to be said for the appearance of a willingness to bargain. In aid of this, a second proposal was included on the ballot asking for 1.5 mills additional levy. The 1.5 mill proposal was regarded by both the superintendent and the board as a `pipe dream´. Nonetheless, it made a good stalking horse for the 24 mill proposal. It gave tax protesters something to vote against. Moreover, if debate over the virtues of the 1.5 mill proposal moved to the fore, it might divert negative attention from the 24 mill proposal. Further, if the two proposals both passed, so much the better.

While the agenda setting stage of the September election strategy appeared set, neither the superintendent nor the school board had a clear idea of how the campaign should be run. To develop an operational plan, the superintendent asked a member of his staff to act as consultant. Within the school district administration was an individual who had extensive experience in the operations of political campaigns. This person had been active in Democratic party politics in the Sault area at various levels including a term as the local party chair. While he had never attempted to manage a tax election, he had a working knowledge of the mechanics of any political campaign. The superintendent asked that he put aside other duties and develop an analysis of the possibilty of passing either or both of the proposals.

Much to the surprise of both the board and the superintendent, the consultant's report was favorable. In so doing, however, the report was critical of the design of the past to campaigns. Both the March and June campaigns had emphasized persuasion and high levels of media exposure. These activities may have stimulated turnout, but there seemed to be as many or more `no' voters gained as `yes' voters. At this point, given the experience of two very similar proposals, it was unlikely that many potential voters were undecided over the 24 mill issue. Given fewer people to persuade, persuasion activities should be deemphasized and limited to just those individuals who could be identified as undecided on the 1.5 mill question. Thus, the first major recomendation of the consultant was the abandonment of the multimedia presentation and high media exposure in general.

Earlier efforts to manage the style of appeal by precinct were also criticized. There appeared to be a certain amount of justification for ignoring the rural precincts went targeting resources for the campaign. Nonetheless, using the precinct as the unit of analysis to manage a turnout campaign had led to mixed results. In comparing the results of the last two elections, the consultant estimated that a large pool of `yes' voters had voted in only one of the two elections. Indeed, despite the improvements in the June results, the consultant estimated that if just 60% of those who voted `yes' in March but did not vote in June could be turned out, the 24 mill proposal would win by 394 votes. This estimate was based on a plan for turnout management in which the individual voter was used as the unit of analysis, rather than the precinct, and an expected decrease in `no' voter turnout due to deemphasis of generalized media. Passage of the 1.5 additional

mills was less likely under this plan.

Clearly, a large number of those who would vote `yes´ on 24 mills would be undecided or negatively disposed toward the 1.5 mill proposal. The key to victory would be the location and persuasion of those undecided voters. Assuming 750 undecided 1.5 mill voters, a targeted persuasion campaign was estimated to be able to generate a 70/30 split by election day. This would yield a hypothetical 300 vote advantage for the 1.5 mill issue amoung previously undecided voters. This margin might be sufficient to pass the issue, or at least keep the results close. Moreover, even if the 1.5 mill proposal failed, the type of targeted persuasion campaign advocated would have the residual effect of shoring up support for the 24 mill proposal. This should lead to an even greater margin of victory than that projected by just the targeted turnout campaign.

In keeping with these goals, the consultant presented a campaign plan with three integral stages of activities: Voter Identification; Targeted Voter Persuasion; and, Targeted Voter Turnout. In order to structure the targeted activities of persuasion and turnout management, information concerning the distribution of individual voter preferences had to be gathered and analyzed. This phase of the campaign would take approximately two weeks to complete. Once the data was available, the campaign would shift to persuasion tactics directed toward those voters which had been identified as undecided on the 1.5 mill question while supporting the 24 mill issue. At the same time, a campaign to motivate those voters who were identified as favoring either 24 or 25.5 mills, but who had not voted in either of the last two elections, was to be initiated. In addition, all voters who had

been identified as favoring the 24 mill proposal were to be contacted with respect to their possible need for an absentee ballot. Finally, as the campaign pulled within ten days of the election, activities would shift to turnout management.

The entire campaign plan was distinctly labor intensive. The plan called for an estimated 1000 person/hours of labor, but only $717 total material costs (most of these related to direct mailings). This represented a major change from the previous two campaigns. Both of these had been media intensive with relatively high associated material costs, but only limited requirements in terms of labor. Clearly, in order to implement the plan, a pool of labor needed to be recruited beyond the small group of community volunteers who had participated in the previous campaigns. For this pool, the consultant turned to the unions representing the teachers (the Michigan Education Association) and the clerical and custodial staff (the United Steelworkers). Since most of the labor involved `behind the scenes´ activities (i.e., phone calling, envelope stuffing, etc.), the use of clearly self-interested personnel such as these was not expected to seriously hurt the campaign´s appeals to `the common good´. Even so, while roughly three quarters of the campaign staff were school employees, only community volunteers were to be allowed to participate in such visible activities as door to door canvassing and poll watching.

Not surprisingly, the school board chose to implement the consultant´s campaign plan as designed and assigned him the task of managing the campaign. With less than two months remaining before the election, the program began apace.

Implementing the Campaign Plan

The first task to be addressed was not the actual conducting of the telephone survey to identify voters, but rather, the training of those staff members who would conduct the survey. The training sessions were conducted in the evenings and involved a series of role-playing exercises. In this way, staff members were given the chance to work through ways of handling various situations which might occur during the survey. Staff members were taught how to avoid discussing the issues of the campaign, deflect questions concerning who was taking the survey, as well as proper means of gaining and coding the information needed.

The targeted sample to be surveyed included 5700 of the approximately 12,000 registered voters in the district. These individuals were grouped into three classes: (A) those who had voted in both of the last two millage elections; (B) those who had voted in only one of the last two millage elections; and, (C) those who had voted or registered in the last two years, but had not voted in either millage election. The survey placed emphasis on the urban and suburban areas of the district; coding each case by precinct number to aid in the precinct level organization of canvassing and poll watching activities. Opinions on the two millage proposals were coded as: (1) supporter; (2) undecided; and (3) opposition. The case identification used was the last five numbers of the respondent's phone number (this cut down on administrative time in phone canvassing). Thus, a typical coded responce would be : 02A1253362. This is a person in the second precinct who voted in both previous elections, favors the 24 mill

proposal, is undecided about the 1.5 mill proposal and lives at the given phone number. Once so coded, opponents were removed from the sample. The sample information was partitioned by precinct and then by the alphabetical voter code and the preference codes. From this a series of lists were drawn up for distribution to the local precinct organizations.

Once the survey was completed, activities turned to persuasion and motivation. These involved direct, targeted door to door canvassing. Only community volunteers were used for the actual contacts with the voters. These volunteers went out in pairs, armed with campaign literature, only to houses and individuals assigned to them on particular lists. Three types of lists were drawn up. One type of list included `C' voters (or, rather, nonvoters) who had been coded as favoring both millage proposals. Here the only persuasion needed was to get these people to vote. The canvassers were schooled in a variety of arguments which were designed to convince these individuals of the importance of their particular vote in determining the outcome of the election. A second type of list included `A' and `B' class voters who were coded as undecided on both millage proposals. The canvassers were schooled in a different variety of arguments which emphasized the schools and children of the district (avoiding the issues of taxation itself as much as possible). The only time discussions were to voluntarily focus on tax issues themselves was when talking to senior citizens -these were entitled to a rebate of their school millage. Finally, a third type of list included `A', `B', and `C' voters who were coded as favoring the 24 mill proposal but being undecided on the 1.5 mill proposal. Arguments here stressed the notion that the 1.5

mill proposal was not for `extra' programs, but was needed for the same basic budget items as the 24 mill proposal.

As canvassing activities progressed, lists of voters were continually updated. The goal was to complete the canvassing by August 29th. Interestingly, no door to door contact was made of `A' and `B' class voters who were coded as favoring both proposals. Nonetheless, these voters were not neglected. All voters who were coded as supporting the full 25.5 mills were contacted by phone concerning the likelihood that they might need absentee ballots. This phone campaign served to reinforce the support of these voters as well as aid in the turnout management of absentee voters. While the `C' class voters were included in both this group and the door to door canvassing, the additional attention was deemed appropriate given their past history of nonparticipation. The absentee ballot campaign was designed to conclude by August 27th. As lists of absentee voters were made-up, poll watchers regularly checked the lists available through the municipal government to make sure that their voters both received and filed their ballots. Follow up calls were given to tardy voters.

On August 20th, a meeting was called of all campaign volunteers to coordinate activities for the turnout management phase of the campaign. Over 50 people attending the meeting were organized into precinct teams which played various roles. Each precinct had two captains, one was a member of the school administration the other was a community volunteer. This division of labor at the top reflected the division of labor throughout the precinct team. School employees were assigned to the tasks of telephone canvassing and direct mail appeals, while community volunteers acted as drivers, babysitters and poll

watchers. The first stage of the turnout management campaign involved the use of direct mail appeals.

The direct mail campaign involved to separate mailings. One was sent to those voters who were identified as supporting the the entire 25.5 mills. These voters received a signed letter thanking them for their support and giving a general pep talk on the prospects of passage if all true supporters come out to vote. This was mailed on August 22nd and received that fourth week of the month. The second mailing was sent to all potential supporters of either proposal. This was a more modest affair than the first mailing, a simple `thank you´ on note sized paper. However, it was this mailing which was expected to have the greater effect in that it was timed through the mail to be delivered on election day.

The telephone campaign to manage turnout was organized in three phases and coordinated with poll watchers, drivers and baby sitters. The first battery of calls went out on Monday, September 1st (the day before the election) between 6:30 and 9:30 in the evening. The telephone script provided a simple reminder to supporters of either proposal and provided rides to the polls and babysitters to those who needed them. This round of calling was the most demanding in that all the voters identified as supporters were actually phoned. The second and third rounds of calling went out between 3:00 and 5:00 p.m. and 6:00 and 7:30 p.m. on election day. These calls were coordinated with the poll watchers who kept track of which `yes´ voters had not voted by 2:30 and 5:30, respectively. The first phone script informed voters that the election was "very, very close" and that "if too many people stay home the ...millage won´t be passed". The second script spoke of

"very little time left". Both scripts repeated the offer to supply rides and babysitters.

The election results were satisfactory but not wholly as projected. The 24 mill proposal passed by a 175 vote margin, the 1.5 mill proposal failed by a 887 vote margin. The reason for this breakdown from the early estimates can be attributed to an idiosyncratic event. A former school board member staged a virtually single-handed campaign against the proposals through the `letters to the editor' section of the Sault Evening News. This individual had opposed increases in teacher's salaries during the last round of contract negotiations. As a result, the MEA had opposed her reelection to the board (to which she attributed her defeat). When she discovered the use of MEA personnel in the millage campaign, she launched a particularly bitter series of written attacks against the proposals. The anomaly of a former board member attacking her former colleagues attrached media attention which undercut efforts to minimize turnout of `no' voters. This undoubtedly contributed to the curiously large aggregate turnout in the election: 5376 votes or 44%, a full nine percent increase over the June results.

Reflection on the Hypotheses

This chapter of the dissertation has detailed the events of an actual tax referendum with the purpose of demonstrating the relevance of the formal structures and hypotheses developed in earlier chapters. The narrative presented here used these hypotheses as a guide to interpretation of the events. This presentation has arguably offered positive instances of the application of strategies and behaviors

which derive from or are analogous to those given in the hypotheses and the experimental results. Over the ten year electoral history the school board was argued to have developed several sophisticated strategies in their proposal behavior which shared several theoretical and practical features with strategies used by `sophisticated' subjects in the experimental setting. The gradual development of this type of sophistication tends to support the notion that sophistication itself is, as hypothesized, a reflection of skill and experience which may be learned over time.

With respect to the Piele and Hall hypothesis, the strategy employed by the consultant/campaign manager reflects a faith in the truth of the hypothesis, and the results of the election are certainly consistent with what is expected under the hypothesis. The key to success seemed to be the management of turnout which was predicated upon the gathering and analysis of information concerning the distribution of preferences within the electorate. Indeed, despite the actual increase in aggregate turnout, effective management seems to have actually shifted the location of the median voter to a higher level of demand. While this result is consistent with the result reported in the Rubinfeld[1977] study, the analysis presented here goes beyond Rubinfeld to attribute the outcome to particular behaviors observed during the campaign.

It certainly can be argued that the narrative and discussion presented in this chapter are somewhat of a self-fulfilling prophecy. The evidence has been organized and interpreted in a way which necessarily corresponds to the theory proposed. Nonetheless, there were specific expectations that were capable of being falsified here.

In a Popperian sense, the fact that they were not falsified does not lead to the conclusion that the hypotheses were necessarily correct. Certainly, other interpretations could be offered and might provide a better basis for analysis. Still, without the theory to guide the analysis in the first place, nothing would be achieved.

EPILOGUE

In the introduction to this dissertation I referred to the project as a "study in craft". As such, I have labeled this closing section an `epilogue' rather than a `conclusion'. The research presented and discussed in the body of the dissertation can be appreciated from several prospects. On its most basic level, this is a dissertation about tax referenda. On another level, the dissertation can be understood as an effort to use and demonstrate the potential of a particular methodology. That is, this could be viewed as a dissertation about using experimental methods to form a bridge between formal theory and interpretations of `real world' phenomena. Alternately, this dissertation might be viewed as an argument supporting the importance of incorporating political understandings in formal models of various policy environments -supporting the unique contribution which political science can make to `policy science'. While all of these interpretations (and others as well) have merit, it is the last one which I shall focus on in this epilogue; and, so, I come full circle to the issues discussed in the introduction.

The `uniqueness' of the contribution that political science can make to `policy science' is established by reflecting upon the current `state of the art'. `Policy science' is the study of the impact of public policy as judged from its design, selection and implementation. While it is not the province of any single discipline, the dominance of economics is manifest through the methods of analysis. The literature is rife with studies employing cost/benefit analysis,

micro-economic theory and modeling, and econometric techniques. Political scientists, as participants in `policy science', dutifully adopt these methods. Nonetheless, political approaches to `policy science' should be distinct from economic approaches. The environment in which public policy is made and implemented is inherently political. The actors who participate in the public policy process are motivated by incentives which must be defined in political terms in order to be coherently understood. Given this, we might expect that a `political approach' to policy science would be worthwhile.

In the introduction to this dissertation, I argued that the distinction between political and economic approaches to policy science was made in terms of `ends' versus `means'. That is to say that, a `political' approach puts primary emphasis on the analysis of the dynamics of conflict within the public policy process, while economic approaches stress the location and evaluation of the outcomes of the policy process. Nonetheless, concern for the outcomes of the public policy process is not absent in political approaches, nor is concern for the dynamics of conflict ignored in economic studies. Indeed, the two approaches do not differ in terms of subject matter or methodology. Thus, the argument made in the introduction is rather complex and, on a superficial level, appears self-contradictory. In light of these difficulties, the five chapters between this point and the introduction can be interpreted as an illustration of the argument.

The first chapter presented an overview of the literature concerning tax referenda from an economic point of view. True to form, the emphasis of this body of research was given to two questions: `Is the

median preference dominant?'; and, 'Is the median preference efficient?'. The critique of these efforts wove its way through several different attempts to answer these questions and closed the chapter by suggesting that these authors had not only failed to provide such answers, there is serious doubt as to whether these questions can be meaningfully asked in the tax referendum context. The next four chapters of this dissertation provided an alternative approach to analysis of the same subject matter discussed in the first chapter.

The problem was recast in political terms. The failures of the first chapter were reinterpreted from a new perspective. For instance, the Bowen model, which had inspired the largest body of studies discussed in the first chapter, was examined in terms of the motives attributed -perhaps inadvertently- to the governmental agenda setter of a tax referendum. An alternative set of assumptions concerning such motives was supplied by discussion of the Niskanen model and with them came a new set of expectations. However, both the Bowen and Niskanen models remain in the style of economic analyses. As such, their use in this dissertation was modified to reflect a more 'political' style. This stylistic change is reflected in the emphasis placed upon institutional variables such as serial bargaining, as well as a discussion of the relevance of the personal capacities of actors to control risk and develop sophisticated strategies. Finally, the discussion turned to the relevance of turnout in determining the outcome of a tax referendum, as well as the potential for actors to control turnout as a strategic resource. With these factors included in the analysis, the expectations for outcomes become far less

precise.

At this point, discussion shifted from notions of stable equilibria to ranges of possible outcomes. Such a change is most indicative of the `political´ approach. Indeed, as the precision of forecasting with respect to the policy outcome declines, so does the ability of the economist to evaluate its efficiency. Such a move stands as anathema to the economic approach and those who practice it. Nonetheless, if the modifications discussed in this dissertation are valid, the apparent precision of previous models of the tax referendum setting is no more than an artifact of an erroneous set of assumptions. Moreover, by bringing these matters to the fore, the possibility for developing better models is given in the grounding provided by a better understanding of the dynamics of the environment under study. To these ends, the third through fifth chapters of this dissertation sought to demonstrate the validity of the arguments presented in the second chapter.

I leave it to the reader to judge the relative success of this effort. While the case study provided in the fifth chapter gives illustration to the theoretical points made in earlier sections, it falls far short of establishing the empirical basis for a broad general theory of tax referenda. All that can be claimed for it is that it appears to represent a more meaningful interpretation of the events of a single case than can be provided in the theoretical models discussed in the first chapter. We have not yet reached the point where a general econometric model of tax referenda can be designed let alone meaningfully interpreted.

APPENDIX

SUMMARY OF PAYOFFS FOR SMALL GROUP EXPERIMENTS

ALTERNATIVE NUMBER	PLAYER 1 PAYOFF	PLAYER 2 PAYOFF	PLAYER 3 PAYOFF	PLAYER 4 PAYOFF
0	2.75	4.00	3.50	2.00
10	5.00	4.50	4.00	2.50
20	11.00	6.00	4.50	3.00
30	9.00	7.50	5.00	3.25
40	5.50	8.00	5.50	3.75
50	3.50	13.00	6.00	4.00
60	3.25	10.00	7.00	6.00
70	3.00	8.00	11.00	8.25
80	2.75	5.50	14.00	12.00
90	2.50	4.00	15.50	15.00
100	2.25	2.50	16.00	17.00
110	2.00	2.00	11.00	20.00

INSTRUCTIONS FOR SMALL GROUP EXPERIMENTS

COMMON INSTRUCTIONS FOR ALL THREE SETTINGS:

1. We would like to have you participate in a committee process experiment. The purpose of the experiment is to help us understand certain aspects of the generally complex ways in which committees operate. The instructions are simple. If you follow them carefully and make good decisions you might earn a considerable amount of money. You will be paid in cash.
2. All you have to do is to attend a committee meeting and for this participation you will be paid. The purpose of the meeting is to choose a number from the set of numbers from zero through 110. Only one number will be chosen and the payment you receive for participation depends entirely upon which one it is. For example, on the enclosed compensation graph, you can read up from the number 30 to the line graph, and then over to the vertical axis to discover the amount you will be paid if the number 30 is the committee's choice. The amount for other numbers can be discovered similarly. The compensation tables may differ amoung individuals. This means that the patterns of preferences differ and the monetary amounts may not be comparable. The option which would result in the highest payoff to you may not result in the highest payoff to someone else. You should decide what choice you want the committee to make and do whatever you wish within the confines of the rules to get things to go your way. The experimenters, however, are not primarily concerned with whether or how you participate as long as you stay within the confines of the rules. Under no circumstances may you mention anything quantitative about your compensation. You are free, if you wish, to indicate which ones you like best, etc., but you cannot mention anything about the actual monetary amounts. Under no circumstances may you mention anything about activities which might involve you and other participants after the experiment (i.e., no deals to split up afterwards and no physical threats).

SPECIAL INSTRUCTIONS:

(OPEN AGENDA)
3. PROCEDURES. The following procedures must be followed. Player 4 has been designated as a convener. The convener is not a member of the committee and therefore cannot vote on any of the proposals. The option chosen by the committee will be the one proposed by some member of the committee and ratified by a majority of the committee (two or more people). Any failure of the committee to act automatically results in a committee choice of option `0'.
The committee will have a discussion period lasting a minimum of 5 minutes and a maximum of 15 minutes in which the convener is not present. During this time, the

committee, operating under majority rule, should try to come to some agreement as to their preferred option.
At the conclusion of the discussion period, the convener will formally open the decision period for the committee. Open discussion may continue; the convener is free to make suggestions to the committee. At any time during the decision phase, any committee member may make any formal proposal (s)he likes. A committee member proposes options in writing by completing and signing the forms provided. Any proposal by a committee member automatically cancels any previous, unratified proposals by that committee member. A proposal is ratified if it is signed by a majority of the committee; i.e., to be ratified, a proposal must be made by a committee member and approved by at least one other committee member. A proposal once ratified is final and all participants will be paid accordingly.

(AGENDA CONTROL-MULTIPLE PROPOSAL)
3. PROCEDURES. The following parliamentary procedures must be followed. Player 4 has been designated as a convener. The convener is not a member of the committee and therefore cannot vote on any of the proposals. But, the option chosen by the committee will be the one proposed by the convener and ratified by a majority of the committee (two or more people). Any failure of the committee to act automatically results in a committee choice of option `0´.
The committee...their preferred option.
At the conclusion of the discussion period, the convener will address the committee. Committee members are free to make suggestions to the convener. The convener may propose any option (s)he wants, or (s)he can refuse to propose options if (s)he so desires. (S)he proposes options in writing by completing and signing the forms provided. Any proposal by the convener automatically cancels any previous, unratified proposals. A proposal is ratified if it is signed by a majority of the committee; i.e., to be ratified, a proposal must be signed by the convener and approved by at least two committee members. A proposal once ratified is final and all participants will be paid accordingly. A proposal which is not ratified, and is then cancelled by another proposal may be reproposed again and again.
4. TERMINATING THE MEETING. The meeting can be terminated in any of three ways:
i) If some option is proposed and ratified, the meeting is terminated and the committee members are paid on the basis of the committee´s choice.
ii) If a motion to adjourn is approved by a majority of the committee, the meeting is terminated. Any committee member is free to introduce such a motion at any time. The motion must be submitted in writing and signed by a majority of the committee. If the meeting adjourns without a choice, then option `0´ is automatically designated as the choice and you will be paid accordingly.
iii) The convener has the right to adjorn the meeting at any

time. (S)he does so simply by submitting the anouncement in writing to the experimenter. Again, if the meeting adjourns without a choice, then option `0´ is automatically designated as the choice and you will be paid accordingly.

(AGENDA CONTROL-SINGLE PROPOSAL)
3. PROCEDURES. The following parliamentary procedures must be followed. Player 4 has been designated as a convener. The convener is not a member of the committee and therefore cannot vote on any proposal. But, the convener is the only one who can introduce an alternative to be voted on against the status quo. The status quo is option `0´. The committee will vote on any alternative proposed by the convener against the status quo.
The committee...their preferred option.
At the conclusion of the discussion period, the convener will address the committee. Committee members are free to make any suggestion to the convener. Discussion will be open for as long as the convener wishes. Whenever (s)he chooses to do so, however, the convener may officially propose an option. The convener may propose any option (s)he wants. (S)he proposes an option in writing by completing and signing the form provided. The proposal is official and discussion ends when the convener hands the proposal to the experimenter. At that time, each of the three committee members casts a secret ballot for either the status quo alternative `0´ or for the alternative proposed by the convener. The ballots will be counted by the experimenter. If the convener´s proposal gets two or more votes, then it wins. Otherwise, the status quo alternative wins. The winning alternative is final and all participants will be paid accordingly.

QUESTIONNAIRE FOR LARGE GROUP TURNOUT EXPERIMENT

We would like you to answer a few questions about yourself. The questions are similar to those which are used in political research. Please try to answer them completely and honestly. When you have answered all the questions return this questionnaire to Dr. Miller.

1. NAME 2. STUDENT NUMBER
3. Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?
4. If you answered #3 as a Republican or a Democrat, would you call yourself a strong supporter of the party, or a not very strong supporter of the party?

(Please indicate whether you agree, disagree, or cannot decide with each of the following eight statements.)

5. People like me don't have any say about what the government does.
6. Voting is the only way that people like me can have any say about how the government runs things.
7. Sometimes politics and government seem so complicated that a person like me can't really understand what's going on.
8. I don't think public officials care much what people like me think.
9. It isn't so important to vote when you know your party dosen't have any chance to win.
10. So many other people vote in the national elections that it doesn't matter much to me whether I vote or not.
11. If a person doesn't care how an election comes out he shouldn't vote in it.
12. A good many local elections aren't important enough to bother with.
13. While in school, how far do you live from campus?
(LIST OF DISTANCES)
14. How do you usually get to class?
(LIST OF MEANS OF TRANSPORTATION)
15. Besides PLS200, do you have any other classes on fridays?
(more than one;one;none)
16. During the past twelve months have you ever played the state lottery?
(regularly;occasionally;never)
17. I am:(MALE;FEMALE)

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