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AN ANALYSIS AND TEST OF ELECTORAL
COMPETITION THEORY

DISSENTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Sandra Kay Davis, B.A., M.A.

* * * *

The Ohio State University
1980

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Elections may serve a number of functions such as making the citizen feel that he belongs to the community, facilitating the citizen's willingness to accept governmental decisions and increasing the citizen's actual and psychological control over the course of his life and environment (Pateman, 1970). While all of these functions have been the object of concern and inquiry, political scientists have spent a great deal of time and effort trying to determine whether the citizen can use his vote to influence the government's policy decisions.

In order to determine whether a link exists between the citizens' vote and the government's decisions, political scientists have tried to explain why the citizen chooses one candidate over another. It is assumed that citizens must use some relevant policy criteria when they evaluate candidates if the link is to exist. A number of factors which may influence the voting choice have been identified by only some of them are policy related. Campbell, et al. (1960) have arranged the
various influences in a funnel of causality according to how close or far in time the variable is to the voting decision. Sociological background characteristics such as race, religion, class, education, occupation and parents' characteristics are farthest removed from choosing a candidate. These background variables serve to influence the next variable in the funnel which is party identification; and it, in turn, influences the citizen's evaluation of candidates and issues. Campaign events reported by the media and political conversations with family and friends are placed even closer to the voting choice.

It is important to know which of these variables influences the vote to be able to determine the basis on which a voter chooses a candidate. If voting is to link the voter to policy decisions, there must be some evidence that the voter's choice is based on some policy relevant criteria. It is generally suggested that citizens should vote for candidates who agree with them on the issues so that the winning candidates can then make decisions in government which reflect the voters' preferences. Elements of candidate evaluation may also serve as relevant links to government policy. A citizen who chooses the most competent candidate may be choosing the candidate who will be best qualified to establish and administer the policies which the citizen prefers. A citizen who votes for candidates who will promote his policy objectives is often described as a rational voter.
The theory which asserts that a voter chooses candidates who will be most likely to establish policies that the voter supports is called electoral competition theory (see Downs, 1957; Davis and Hinich, 1966; Plott, 1967; Davis, Hinich and Ordeshook, 1971; Aranson and Ordeshook, 1972; Riker and Ordeshook, 1973). Traditionally, electoral competition theory (ect) has assumed that the voter makes his choice solely on an evaluation of the candidate's issue positions. The theory also goes on to predict that (under certain circumstances) candidates will realize that if they each take the same nonextreme issue position they will maximize their ability to win votes. Once they are in a position to maximize the votes they win, they have no incentive to take any other issue position and they come to rest at a convergent equilibrium at the voters' median issue position.

The purpose of this research is to assess the usefulness of electoral competition theory's explanation of voting behavior and candidate strategies. This chapter will present a brief statement of the theory and the criticisms which have been made of it. Next, an empirical test of the theory's assumptions and predictions will be proposed. In the process of evaluating the testing ect, the goals of the analysis will be to 1) suggest a modification of the theory, 2) produce a means of testing the theory which will improve upon existing analysis and 3) test part of the theory which has not been empirically tested.
The basic assumption of electoral competition theory is that man is a rational actor who seeks to promote his self-interest (Downs, 1957; Davis, Hinich and Ordeshook, 1971). The individuals' self-interest or utility is conceptualized as the similarity of his ideal issue position and a candidate's issue position. The more similar the voter's and candidate's issue positions are, the greater the individual's utility is. Candidates try to adopt strategic issue positions which will provide them with electoral victory. Under specified conditions, candidates adopt similar centrist issue positions that are at an equilibrium (Riker and Ordeshook, 1973, p. 343; McKelvey, 1975).

Electoral competition theory tries to explain why voters choose a candidate. The theory shows that electoral decision making follows logically from its self-interest assumption. It also goes beyond the individual-level decision making process (i.e., how citizens vote) and examines macro-level decisions (i.e., presentation of alternatives to voters, candidate equilibrium positions and the congruence of social choice mechanisms with democratic theory). According to electoral competition theorists, when candidates take similar positions at or close to the median preferred position, the social choice is optimal under certain circumstances (Downs, 1957;
Davi8 and Hinich, 1966; Davis, Hinich and Ordeshook, 1971; Riker and Ordeshook, 1973). Regardless of which candidate wins, the most preferred policy is carried out (Page, 1977).

A PROPOSAL TO MODIFY AND TEST ELECTORAL COMPETITION THEORY

Although there is disagreement among philosophers of science about the qualities a useful theory must have, in this research it is expected that if elect is to be useful it will 1) have assumptions which are explicitly stated and reasonably descriptive of reality (Fiorian, 1975; Thorson, 1976) and 2) have one core axiom which provides an explanation of why individuals behave as they do (Lakatos, 1970). These are demanding requirements and many critics of elect feel it cannot meet them. Rational choice theory is often criticized because it assumes citizens engage in issue voting (Riker and Ordeshook, 1973; Page, 1977). Issue voting requires a high level of political knowledge and many doubt that citizens can meet the information requirements (Page, 1977). Researchers also suggest that citizens are unlikely to engage in pure issue voting because of the affective ties the voters have for the candidates and parties (Campbell, et al., 1960; Markus and Converse, 1979; Page and Jones, 1979). Even though these critics realize that issues can be important short term forces,
they are skeptical that issues have a predictable long run impact (Converse, 1966; Boyd, 1972).

Critics have also questioned more technical requirements pertaining to individual citizen's evaluation of a candidate (utility function) and the distribution of these preferences across the electorate (Plott, 1967; Fiorina, 1975; Page, 1977). Although these criticisms will be reviewed in greater detail in later chapters, suffice it to say that the assumptions require that citizens calculate their issue and candidate preferences in rigid and uniform ways. Studies in belief systems and ideologies have suggested that citizens organize their perceptions of issues and candidates in more idiosyncratic than uniform ways (Converse, 1964; Bruner, 1978; Wyckoff, 1979).

In this research it is also expected that if ect is to be useful it will be based on one core axiom which will explain why voters and candidates behave as they do. In ect, this axiom is that voters and candidates act to maximize their self-interest. This axiom is critically important since it is the heart of the theory from which the deductions about predicted behavior are made. A number of auxiliary assumptions such as those about utility functions or issue voting are made but can be changed without threatening the underpinnings of the theory.

A modification of the theory is suggested in this research. It will be proposed that the auxiliary assumption which
requires issue voting be changed so that a citizen who evaluates a candidate's issue positions and his competence be deemed to be acting within the bounds of the theory. This modification is justified on a number of bases. First, there is evidence that candidate competence evaluation is one important influence on the voting decision (Steper and Teeter, 1976; Popkin, et al., 1976). Empirical research indicates that both issues and candidates' attributes influence the voting decision. Second, it appears that it is exceedingly difficult to separately delineate the effects of issues, candidates and parties on the vote (Brody and Page, 1976; Niemi and Weisberg, 1976; Markus and Converse, 1979; Page and Jones, 1979). The problems associated with producing "pure" issue evaluation variables might be so formidable that the goal of testing the theory would be forgotten. Third, the addition of candidate competence evaluation will actually strengthen the theory by correcting an unrealistic auxiliary assumption. Fortunately, it is just as reasonable for a voter to receive utility from a candidate's competence as it is to receive utility from the candidate's issue positions. In summary, candidate competence is proposed as an addition to rational choice theory which will alleviate one of its basic deficiencies.

In addition to responding to criticisms of rational choice theory by incorporating candidate competence evaluation, there is another means of helping put to rest some of the controversies
surrounding ect. This other means involves using survey data to determine whether the theory's predictions about voter and candidate behavior hold.

Although a number of researchers have already used survey data to produce spatial representations which indicate how candidates are arrayed on political dimensions (Weisberg and Rusk, 1970; Rusk and Weisberg, 1976; Aldrich and McElvevay, 1977; Rabinowitz, 1978), none of these analyses was primarily designed to test ect. These analyses can help guide this research, but all of them are deficient in one way or another as a test of ect. One deficiency in the analysis by Rusk and Weisberg (1970 and 1976) is that voters were not placed in the electoral spaces. In this analysis voters will be included in the space so it will be possible to determine if they chose the closer candidate.

A second deficiency (see Weisberg and Rusk, 1970; Rusk and Weisberg, 1976; Rabinowitz, 1978) is that too many candidates were included in earlier analysis. This research will be based only on evaluations of the nominees.

A third deficiency of these same analyses is that the dimensions produced indicate the underlying cleavages of political conflict or the differences among the candidates on partisanship, ideology or other dimensions that organize different political perspectives. A candidate tends to be located toward the end of the dimension which best describes
his partisan or ideological position. The preferred type of dimension would represent some underlying issue dimension such that a candidate who had a peripheral location would also have an extreme issue position. Candidates located near the center of such a dimension would have issue positions similar to the voters' median issue position. Only when the dimensions in the space measure the relative candidate-voter proximity on issues will the analysis serve to test for...

While Aldrich and McKelvey (1977) did analyze the relative proximity of the voters and candidates on issues, their analysis was not produced using a multidimensional technique and it was based on only two issues. Both of these factors (which will be discussed in greater detail in chapter 4) raise questions about the suitability of the analysis as a test of ect.

This analysis was planned to try to avoid the problems which have just been described. Issue proximity questions (which measure the similarity of a candidate's and a voter's issue preferences) and scaling techniques will be used to place voters and candidates in a space according to their proximity on issues. The issue distances between respondents and candidates will be measured to determine if respondents do vote for the candidate who has the more similar position. Candidates located near the center of the space will be close to the voters' median issue position. Once the electoral space is
created using only issue variables, a second space will be created using issue and candidate competence variables. Again, the space will be examined to test the predictions of the theory.

While there are analyses which examine the relative proximity of candidates and voters, there have not been any studies to determine whether candidates actually choose equilibrium positions. Although there is a number of different sets of assumptions which predict the candidates will choose central equilibrium positions (see Riker and Ordeshook, 1973, p. 343; McKelvey, 1975), theorists often suggest that equilibrium positions are unlikely to occur (Plott, 1967; Page, 1977). This suggestion may have discouraged researchers from testing the predictions of equilibrium. In this analysis, however, the candidates' positions will be analyzed to determine if they are at an equilibrium. This will be accomplished by examining the positions of the candidates relative to the distributions of voters in the electoral spaces.

In summary, this analysis will attempt to remedy three deficiencies. First, it will propose that evaluation of a candidate's competence be added to make the theory more descriptive of reality. Second, it is proposed that a new combination of variables and statistical techniques be used to produce electoral spaces that will be suitable to test ect. In these spaces a central location will represent an issue.
position similar to the voters' median position and a peripheral position will represent a position dissimilar to the voters' median position. Third, the electoral spaces will also be analyzed to determine whether, as many versions of ect predict, candidates take positions at an equilibrium. Before the theory is evaluated in greater detail in the next chapter, an outline of the remaining chapters in this analysis is presented.

OUTLINE OF THE CHAPTERS

The next chapter will present an explanation of electoral competition theory. The core assumption that individuals maximize their utility will be described and psychologists' experimental results will be examined to determine whether there is evidence to support this assumption. The auxiliary assumptions will also be described and evaluated. Then, using guidelines proposed by philosophers of science, the theoretical usefulness of ect will be examined.

The third chapter will provide an explanation of the methodology used in the analysis. It begins with an explanation of the attributes that an electoral space should have if it is to serve as an adequate test of ect. Next, the data, operationalization of the variables and the statistical techniques used in the analysis will be discussed.
The fourth chapter will describe the test of ect which is based only on the respondents' evaluations of the issues (i.e., the unmodified theory). There will be a discussion of the deficiencies of existing spatial analyses and the problems encountered in this research. Finally, the electoral spaces will be examined to determine if ect's predictions hold.

In the fifth chapter there will be a test of the modified version of ect which is based on the voters' evaluations of a candidate's competence and his issue positions. Again, the electoral spaces produced in this chapter will be examined as a test of the modified theory's ability to predict voter choice.

In the sixth chapter there will be an examination of the assumptions necessary to produce a centrist equilibrium. The electoral spaces which have already been produced will be analyzed to determine whether the candidates came to rest at an equilibrium. The last chapter will discuss the results of the study, its contributions, and its implications for future research.
CHAPTER 2
ELECTORAL CHOICE THEORY

INTRODUCTION

Currently there is little agreement within the discipline about the role that rational choice theories should play and how they should be evaluated. The purpose of this chapter is to assess one type of rational choice theory called spatial or electoral competition theory (ect). Clarification of ect and a discussion of its explanatory potential is discussed in the following sections. First, there will be a description of ect and an examination of its theoretical premise and assumptions. Second, using guidelines from the philosophy of science, the potential of ect to be a useful and productive theory will be examined.

THE RELATION OF RATIONAL CHOICE EXPLANATION TO PARTY BASED EXPLANATIONS OF VOTING

Rational choice theory ignores the role that the party plays in the political system, but there are other approaches which posit important roles for the parties. For example, the party
may serve as a source for psychological attachment which binds the voter to the political system and influences the citizens' perceptions about candidates and their issue position. This viewpoint is advocated by the "Michigan school" of voting behavior (see Campbell, et al., 1960 and 1967; Stokes, 1966). A second approach explains that parties serve to link the citizen to public policy decisions. There are different ways parties may perform this function. Luttbeg (1974) suggests that party label is important because it provides a cue which saves the voter time and effort in evaluating different candidates for office.

The responsible party model approach describes the party's role in the political system as one of aggregating and communicating citizen demands to the government (see Almond and Coleman, 1960; Luttbeg, 1974). Schattschneider (1942) and the American Political Science Association Committee on Political Parties (1950) make a similar argument when they urge parties to offer the voters distinct choices on the issues.

Both the voting behavior and responsible party explanation describe important roles that the parties play. Two questions need to be asked. First, are these accurate explanations of voting? Second, if they are, can rational choice theory's exclusion of party be justified?

In fact, there is evidence that partisan affiliation does provide the citizen with a sense of psychological attachment to the political system and does predispose some voters to favorably
evaluate their party's candidate. This, however, does not mean that voting behavior and the rational choice approaches are necessarily contradictory. A party identifier's predisposition toward a candidate may be partially based on the party's platform or its past issue positions. And even though nonissue variables influence the voting decision, it is not necessary for rational choice theory to trace the effect of every variable such as party or occupation on the citizen's evaluations of the candidates' issue positions. Instead, rational choice theory focuses on the few most important variables and ignores the others. While rational choice theorists have talked exclusively about pure issue voting which is not contaminated with other variables such as partisan identification, there is nothing in the theory which would prevent an expansion of it to include the effect of party affiliation.

There is, however, a basic contradiction between responsible party theory and the rational choice theory pertaining to the responsiveness of parties or candidates to voters' demands. According to the responsible party model, parties respond to voters' interests by aggregating their demands into competing issue platforms and communicating these to officials. Rational choice theory, on the other hand, contends that, given certain assumptions, competing candidates respond to voters' issue preferences by taking similar (or the same) issue positions at the voter's median preference. It makes little difference
which party wins, since both candidates take a similar position and either would implement the same policy if elected. According to this explanation, then, the candidates respond to citizens' issue preference by taking the same issue positions. This incompatibility will have consequences for rational choice theory and democratic theory that will be discussed more in this chapter and later chapters.

ELECTORAL CHOICE THEORY

The basic elements of rational choice theories will now be examined from the perspectives of social choice and the individual's electoral choice. Both presuppose that people promote their self interest. Many of the basic assumptions and solutions of rational choice theories were initially produced in economics research to explain the competition for markets (Hotelling, 1929; Smithies, 1941). More recently, rational choice theories were adapted to explain political competition (Downs, 1957). In turn, Downs' unidimensional solutions were modified to produce multidimensional solutions by a series of theorists (but especially by Davis, Hinich, Ordeshook, McKelvey and others in the Carnegie-Mellon and Rochester schools). All these theories are based on the core theoretical premise that voters and candidates act to maximize their utility. Candidates adopt the issue positions that will appeal to the most voters, thereby
providing themselves with a plurality of the votes.

In ECt, assumptions are made about citizens' preferences. It is assumed that all citizens perceive the candidate's positions in the same way. This prevents cognitive dissonance and projection from influencing perception of the candidates. All citizens are to be politically informed so they have opinions on the issues. Furthermore, since all issues are equally salient, citizens will be evaluating the same set of issues. Citizen's issue preferences are fixed and are not influenced by nonissue stimuli. Preferences must also be transitive, measurable on a continuous scale and monotonically related to distance from the respondent's ideal point.

Several different assumptions have been made about voter turnout. Citizens may vote or abstain due to alienation, indifference or both. The different assumptions about turnout partially determine if and where a candidate equilibrium exists.

So far, the explanation of ECt and its assumptions pertain to the individual level decision-making process. ECt is, however, more than a description of voters' behavior; it has a more macro-level emphasis which focuses on candidate equilibrium and the electoral process as a mechanism of social choice. The way candidates compete for votes has a number of important consequences for voters and theorists. Theorists are concerned (a) with the similarity or dissimilarity of issue alternatives which are offered to the voters and (b) whether
the candidates take predictable equilibrium positions. Most theorists seem to agree that the similarity of the issue positions indicates how the candidates respond to the issue concerns of the voters. They do not agree whether similar issue positions are an indication of candidate responsiveness or unresponsiveness to voters. Rational choice theorists believe similar or even identical issue positions are most responsive to citizen's issue preferences (see the following research which predicts candidates will take centrist equilibrium positions, at least under certain circumstances: Downs, 1957; Davis and Hinich, 1966; Davis, Hinich and Ordeshook, 1971; Riker and Ordeshook, 1973). Candidates take issue positions at or near the citizens' median preferred positions and the winner (regardless of which candidate it is) carries out the most preferred policy; in this way, the electoral system is responsive to voters. Those who emphasize party responsibility (American Political Science Association, Committee on Political Parties, 1950) and party cleavages (see Chambers and Burnham, 1967; Burnham, 1970; Sundquist, 1973) believe parties respond to citizen's issue demands by providing competing alternatives from which citizens can choose. On a somewhat different level, theorists' own self-interest is affected by their ability to construct theories in which candidates take predictable equilibrium positions. They need to be able to produce equilibrium solutions if they are to have the opportunity to
predict the exact location of candidate's positions.

The implications of the candidate's issue strategies will be discussed more in a later section of this chapter. For the moment it is sufficient to note that the more macro-level predictions of ect have important consequences. These predictions are based on additional assumptions which are even more stringent than those already mentioned. The assumptions vary according to the different type of solutions that is predicted. Models which predict centrist equilibrium solutions make the following assumptions. First, candidates cannot be prevented from taking certain kinds of issue positions; for example, one candidate cannot be restricted to "liberal" positions while the other candidate is restricted to "conservative" positions. Candidates must be free to take any issue position. Second, citizen's utility functions are usually defined as quadratic or quasi-quadratic (although it is possible to produce equilibrium solutions in a few instances with concave utility functions). Third, the distribution of preferences, which must be measurable on an interval scale, are unimodal and symmetric. These last two assumptions about utility functions and distributions of preferences are particularly stringent.

Not all ect predicts centrist equilibrium candidate positions. Particularly in multidimensional cases, there are combinations of assumptions which produce solutions in which there is no equilibrium or there is an equilibrium but it is not always
possible to determine if the candidates will converge or where they will converge (Riker and Ordeshook, 1973, p. 343). Page suggests that ect does not predict the candidates' issue positions under "...the most common empirical circumstances,..." (1977, p. 641).

Other variations of ect predict that the two candidates will take different positions. In most of the divergence theories (see Davis and Hinich, 1966; Aranson and Ordeshook, 1972) political activists, having more extreme issue positions, influence the candidates to take more extreme positions in order to gain financial contributions, other campaign assistance or votes at the nominating conventions. Contrary to responsible party proponents and party cleavage theorists, ect seems to visualize divergent issue positions as antithetical to the voters' preferences.

One unusual variation of spatial theory which predicts party cleavages does not depend upon extremist activists to draw the candidates apart. Downs (1957) uses an assumption which prevents the candidates from moving past each other ideologically. In this type of cleavage theory, candidates respond to the preferences of citizens in "their segment" of the electoral arena by taking divergent positions.

In this section it has been argued that electoral choice theories actually contain two components or sub-theories: a theory of individual level voting behavior and a theory of social choice
which indicates whether candidates are at an equilibrium and how divergent their issue positions will be. It will be further argued that in the individual decision making component, the assumptions are less difficult to meet and the predictions seem more realistic. Conversely, in the social choice component, the assumptions are more demanding and the predictions of candidate equilibrium at a multi-dimensional mean are less realistic. In addition, there may be unpleasant normative considerations as well. The implication that candidates are somehow more responsive by taking centrist positions is especially disturbing. The outline of the argument has now been presented and in the following section, the assumptions and predictions of the sub-theories will be examined in detail.

The Theoretical Premise of an Electoral Competition
Theory Based on Utility Maximiation

The basic theoretical premise which explains decision-making is that man makes rational choices which are in accord with his preferences. If the choice is the most preferred alternative, the decision is rational and the decision maker has maximized his utility.\(^1\) Traditionally, theorists require that preferences be connected, reflexive and transitive if the individual is to maximize his utility (Thorson, 1976, p. 71). Neither the connectedness nor the reflexivity requirements are unrealistic. The connectedness property requires that a chooser
can determine if he prefers one alternative to another or if he is indifferent to both. Reflexivity requires that an alternative is at least as good as itself (Thorson, 1976).

Transitivity is, however, a more controversial assumption in that it requires the decision-maker to consistently indicate the same alternative as his first preference regardless of the situation. Psychologists have conducted experiments on individual decision-making and found that intransitivities occur. While the intransitivity rate was low in some studies (Papandreous, 1953; Buss, 1976), other studies found intransitive preferences 20% (Edwards, 1953) and 27% (May, 1954) of the time. Researchers have coped with such results by producing stochastic models which allow for limited intransitivity. As Edwards (1967) notes, the question for experimenters to answer is not whether transitivity exists, but rather the conditions under which the assumptions of transitivity hold.

Another study suggests the degree of intransitivity can be manipulated by the experimenter (Tversky, 1969). Tversky found that preferences are likely to be intransitive when 1) it is difficult to discriminate between alternatives or 2) early alternatives are not considered in the later stages of a serial decision-making process. Intransitive choices under the conditions Tversky outlines are not necessarily irrational. It would seem that the definition of rational electoral choice needs to be modified to include limited amounts of
intransitivity which are likely to occur when it is difficult
to discriminate between candidates or when there is a serial
decision-making process.

Psychologists have also conducted experiments to determine
if individuals attempt to maximize utility when they make
decisions. They have developed and tested models of utility
maximization called expected utility (EU) and subjective
expected utility (SEU). Generally, both assume that the individual
will choose the alternative from which he expects the greatest
utility. The theory has been tested in several experiments
with small numbers of subjects (see Davidson, Suppes and Siegel,
1967; Mosteller and Nogee, 1967). The findings are generally
inconclusive. Mosteller and Nogee (1967) admit their prediction
rates were not as good as they hoped, but they still claim it
is reasonable to theorize that people act to maximize their
utility. Luce (1967), on the other hand, concludes that
Mosteller and Nogee's experiment was an ambiguous failure.

Davidson, Suppes and Siegel (1967) were able to determine only
the upper and lower bounds of utility functions. This meant
they were unable to make accurate predictions about individual's
choices in ambiguous situations. Luce cites other studies
which have failed to provide evidence to support SEU and
suggests that the decision-making process is probably more
complex than the SEU theory is. Although Luce cites other
studies which have failed to provide evidence supporting SEU, he
does not suggest that SEU be rejected. On the contrary, the appropriate actions is to modify SEU to include the adaptive behavior individuals exhibit when they have a chance to learn through repeated experiences with the same choice situation.

In summary, the evidence does not provide clear confirmation or disconfirmation for utility maximization. The psychologists who have worked in the area have progressively worked to complicate their models to try to make them more descriptive of reality. Intuitively, this seems to be a reasonable direction to move, but it is possible it will be just as difficult to confirm the modified models as it was to confirm the original model.

The Assumptions and Predictions of ECT Pertaining to Candidate Selection

In a series of assumptions about voter's issue preferences, ect requires that citizens vote solely on the basis of issues. Political scientists doing empirical research disagree about how important issues are, but none of them have provided evidence that issues are the sole determinant of the vote. In this section the literature on issue voting will be reviewed to determine how important issues are so that ect's issue requirement can be evaluated.
Issue Voting

The authors of the American Voter found that only 18 to 36 percent of the electorate (depending on the issue) has an opinion on issues, knew what the government was doing and saw a difference between the party's positions (Campbell, et al., 1960, p. 182). The 18-36% represented a maximum proportion of respondents who could vote on the basis of issues. Stokes (1966) found that issue evaluations generally were not as important as evaluation of the Republican candidate or groups associated with the parties, but the net impact of both domestic and foreign issues served to increase the Republican vote by 2% in 1952, 1956 and 1960 and increase the Democrat's share of the vote by 5% in 1964.

Converse (1964) further raised questions about the likelihood that the electorate engages in issue voting. Examining the stability of the public's issue preferences, his findings suggest that preferences may be more an artifact of the survey process than a genuinely held opinion on an issue.

The revisionists (Natchez, and Bupp, 1970; RePass, 1971; Pomper, 1972, to name a few) have argued that issues are important but research findings do not reflect their importance unless the research is designed properly. One way to proceed is by focusing on salient issues (RePass, 1971). People who think an issue is important are likely to be able to distinguish differences between the party's positions. Similarly, issues
were an important determinant of vote for citizens who were members of issue publics (Natchez and Bupp, 1970). And, when issue position and partisanship conflict on a salient issue, a substantial proportion of the citizens will vote on the basis of their issue preference (Asher, 1980). While these studies offer solid evidence that issues can be and are important in making an electoral choice, they are not evidence that issue voting is widespread. All the analyses have been based on small subsets of the electorate. Actually the subset of people (a) for whom an issue is salient (RePass, 1971), (b) who belong to an issue public (Natchez and Bupp, 1970), and (c) who have incongruent issue positions and partisan identification (Asher, 1980) comprise only a small proportion of the total electorate.

Others have suggested that while issue voting was not prevalent in the tranquility of the 1950s, issues became more important in the 1960s, starting with the 1964 election. RePass (1971) and Pomper (1972) both found that the distinctive differences between the candidates in 1964 produced increased perceptions that there were important issue differences. Again, critics have complained the results are from small subgroups of the voters and, therefore, are not evidence of widespread perception of issue differences. Margolis (1977) reanalyzed Pomper's data using the entire sample and found less evidence that people perceived substantial differences between their
issue positions. And, Margolis' results from the 1972 election indicate even less issue difference between the candidates than in 1968.

By the early 1970s it had become obvious that simply relating the voter's issue position and vote were not adequate evidence that issue voting was occurring. Part of the problem was solved when issue proximity questions became available. It was then possible to correlate vote and issue distance between the respondent and candidate. Brody and Page (1976), however, indicate that a strong relation between issue proximity and vote can be evidence of issue voting, projecting or persuasion. Projection occurs if a respondent's perception of a candidate's issue position is influenced by favorable or unfavorable evaluation of a candidate's personality, party affiliation, competence, etc. Persuasion is the projection process in reverse: a respondent's own issue position is influenced by the position a candidate takes.

The difficulties in trying to distinguish issue voting from projection and persuasion are substantial. Markus and Converse (1979) have used panel data to estimate a dynamic model of the 1976 election. They found evidence that all three processes occurred. Using a nonrecursive model, Page and Jones (1979) also found evidence of issue voting as well as a combined projection-persuasion effect.
The cumulative results of studies of issue voting would indicate that while issue voting does occur, it is not as important and as widespread as act requires. Issue voting is likely to occur under special circumstances: when issues are salient or when issue positions and partisanship conflict. Furthermore, there is little evidence of pure issue voting. Candidate effects via projection and persuasion seemed to be particularly intertwined with issue evaluation. The question of how to disintangle issue and candidate evaluations is not clear. For example, Asher (1980) cites the respondent who said Goldwater was impulsive; the problem is that it is difficult to know if the impulsiveness characterized the candidate or his issue positions. And, if these complications were not enough, it should be remembered that partisan identification and candidate evaluation are important determinants of the vote in their own right (Campbell, et al., 1960; Natchez and Bupp, 1970; Boyd, 1969; Schulman and Pomper, 1975).

Citizens' Candidate Preference and Electoral Competitive Theory Requirements

With the conclusion that issues are not as important as act would seem to require, the focus shifts to requirements pertaining to citizen's preferences for the candidates. Page (1977) and Ordeshook (1976) list the following requirements:

1) All citizens perceive that a candidate has the same issue position.
2) Citizens are informed about the issues.

3) Since the same issues are salient to all citizens, the candidates are evaluated on this one set of issues.

4) Citizens have stable and genuine issue preferences.

5) Citizens' preferences are transitive and cardinal.

Existing research results will now be examined to determine if citizens' attitudes are consistent with the above requirements.

First, all citizens must perceive that a candidate has the same issue position. In fact, there is good evidence that different people have different perceptions of a candidate's issue position. Bruner (1978) examined respondents' perceptions of candidate issue position and found that different people had very different perceptions of the candidate's positions. Respondents were asked to place candidates on 7-point scales. The opposite positions on an issue are indicated with verbal labels. For example, on a busing question, respondents will be asked to place the candidate at the "bus to achieve integration" end, the "keep children in neighborhood schools" end or one of the five intermediate categories. The candidate was perceived to be at each of the seven positions by different groups of respondents. Clearly this assumption is not met.

A second requirement is that citizens have information about the issues. When questioned about each of 16 issues, only about 1/3 of the respondents had an opinion and know what the federal government was doing (Campbell, et al., 1960, pp. 173-174).
RePass (1971) asked respondents to name important problems facing the nation. Fourteen percent failed to name even one problem and only 23% named 4 or more problems (p. 398). Respondents do not appear to be as knowledgeable as exect requires.

There is little evidence that citizens meet the third requirement: citizens should agree which issues are salient and evaluate the candidates on this one set of issues. In fact, there are different issue publics whose interests are fractionalized because the few issues that are salient to one group are not salient to the other groups. Natchez and Bupp identified nine issue publics that ranged in size from 2% to 8% of the sample (1970, p. 437). It appears that issues are likely to influence the voting decision of only a proportion of citizens, and even among this group, different people evaluate candidates on different issues.

Fourth, exect requires that citizen's preferences be stable and genuine issue preferences. If the preferences are to be genuine, they should be the citizen's own attitude rather than an attitude he is briefly persuaded to take. Yet, Markus and Converse (1979) found evidence of persuasion in the 1976 election. Robert Weissberg (1976) has suggested that governmental officials engage in a similar persuasion process when they build support for the policies which the government enacts. Another problem occurs because respondent's issue positions appear to be unstable. It is unclear whether the instability which has been
found in citizens' issue attitudes reflects nonattitudes (Converse, 1964) or measurement error (Achen, 1975). In any case, there is little firm evidence that preferences are as stable and free from persuasion effects as ECT requires.

There are several reasons to doubt that citizen's attitudes meet the fifth requirement of transitivity and cardinality. First, political scientists do not have satisfactory measures of utility. As Page (1977) indicates, seven-point issue proximity questions are a measure of the respondent's most preferred policy alternative. They do not measure the utility respondents receive from different alternatives. Second, the experimental evidence indicates that intransitivities in preferences do exist under some circumstances. Psychologists adopted decision-making models with stochastic transitivity at least a decade ago; even so, under some circumstances, they found evidence of predictable intransitivities which violated the stochastic models. While ECT could conceivably be modified to include stochastic intransitivity, the fact remains that these findings are not congruent with the requirements of ECT in its present stage of development.

The Assumptions of ECT Pertaining to Candidate Equilibrium

Two basic requirements for centrist equilibrium solutions are quadratic or quasi-quadratic individual utility functions and a symmetric and unimodal distribution of preferences. At
present, there is little information about utility functions (Page, 1977). As noted earlier, there are no measures which provide information about a citizen's utility on each issue alternative. It is not possible to examine individual's utility functions without such measures. Fortunately, seven-point issue questions do provide the means to examine a sample's distribution of preferences. But there is a problem since the responses appear to contain substantial measurement error. Citizens tend to give responses at the ends or the middle of the seven-point scale (Aldrich, 1975). Working from the assumption that the distortion in the perception of the candidates is the result of measurement error introduced by the survey situation, Aldrich and McElveen (1977) devised a scaling procedure to correct for the error. Using their scaled data, the accuracy of their vote prediction increased 2-8% (p. 127), thus suggesting that their assumption about measurement error was correct. Despite Aldrich and McElveen's work, little has been done to examine the distribution of citizens preferences on the issues.

The last assumption required to produce centrist equilibrium solutions is the absence of restrictions on the issue positions the candidates are able to take. This means that a candidate must be able to jump past the other candidate and neither can be prevented from taking a liberal or conservative position. Given either a unimodal or bimodal preference distribution and
universal turnout (or minimal alienation effect on turnout),
it is the candidate's ability to jump past the opponent which
keeps the candidates in the center of the distribution. For
example, if candidates A and B started out in the positions
shown in Figure 1a or 2a, candidate A could increase his
share of the vote by moving slightly to the left of B's position
(see Figures 1b and 2b). Candidate B would then want to jump
past A to move to the center (see Figures 1c and 2c). Candidate
A could jump past B and also move to the center (see Figures 1d
and 2d). In Figures 1d and 2d, regardless of the type of
distribution, a centrist equilibrium is reached because neither
candidate can improve his share of the vote unless his opponent
chooses to move.

Given the same distributions of preferences and the same
assumption about turnout, a restriction on candidate mobility
can produce noncentrist issue positions in a Downsian model.
If candidate mobility is restricted so that neither candidate
A or B can go past each other, candidate A would win the election
by maneuvering himself into the position he occupies in Figure
1b or 2b. Once he is in that position, candidate B is unable
to increase his share of the vote because he is unable to move
past candidate A toward the center. Candidate divergence is
likely to occur in the Downsian model which was just described
only when turnout is elastic and citizens are alienated by
a candidate who takes issue positions far away from their own
Figure 1
An Example of Candidate Competition Under Conditions of Complete Mobility and a Unimodal Preference Distribution

Figure 2
An Example of Candidate Competition Under Conditions of Complete Mobility and a Bimodal Preference Distribution
ideal points.

These examples are offered to suggest the importance of the complete candidate mobility assumption in non-Downsian models. The requirement of complete mobility, however, seems implausible. Although there are no studies that document the stability of candidate issue positions, great fluctuations (particularly in one election) would seem to be the exception rather than the rule. Non-Downsian cleavage models depend on the extreme issue positions of political activists to push the candidates apart.

The assumption that activists have extreme issue positions and are determined to force the candidates to take extreme issue positions is questionable. Certainly some studies have indicated that rank-and-file voters have more centrist issue positions than party leaders (McClosky, Hoffman and O'Hara, 1960; Shaffer, Yarnell and Kessel, 1978), but Nexon (1971) found that both Democratic activists and nonactivists tended toward centrist political positions. Although activists sometimes have more extreme positions, it should not be hastily concluded that activists' and nonactivists' issue positions are always incongruent.

Even if activists did consistently have more extreme issue positions, it is not clear they would necessarily want to push candidates away from winning centrist positions. Political scientists have attempted to distinguish professional party leaders who are primarily concerned with winning elections
from amateur party leaders who are more concerned with issue purity (see Wilson, 1962; Ippolito and Bowman, 1969; Soule and Clarke, 1970; Hofstetter, 1973; Marvick, 1973; Soule and McGrath, 1975).

Some of the research seems spurred by the fear that noncomprising issue-oriented amateurs are a large and powerful group of activists who prevent candidates from winning elections and weaken political parties. At least part of the alarm seems to be based on the assumption that amateur activists are a recent phenomenon and party leaders have traditionally had little interest in issues or ideology. But limited evidence can be provided which refutes these assumptions. McClosky, Hoffman and O'Hara (1960) found that party leaders interviewed as long ago as 1957 and 1958 held issue positions which were more extreme than rank-and-file voters. In a more recent study of McGovern and Nixon's county chairmen, most of the activists expressed strong affective ties to the Democratic Party and few qualified as amateurs (Howell, 1976). In summary, the evidence about activists' desire and ability to push candidates toward extreme issue positions is ambiguous.

There are problems with the assumptions that are required for equilibrium solutions. The centrist solutions depend heavily upon the assumption of complete candidate mobility. This is intuitively unreasonable. In the non-Downsian cleavage theories (which also require complete candidate mobility), it
is the extreme issue positions of activists that push candidates apart. But evidence has been presented which raises questions about the desire of activists to force candidates to take extreme positions. The Downsian cleavage theory is the most appealing of the solutions, because it has a realistic restriction on candidate mobility and it does not require that candidates respond to voters by taking identical (or very similar) issue positions.

Summary

Many questions about the assumptions and predictions of ect can be raised. In later chapters, data will be analyzed where possible to determine how much confirmation can be provided. In this chapter the evaluation must rest on experimental studies of the psychologists and survey research of the political scientists. In terms of the theoretical premise (i.e., utility maximization), the evidence is ambiguous. There is evidence both for and against utility maximization. Psychologists have begun developing more complex utility maximization models of decision-making that show promise.

The assumptions associated with prediction of individual voting behavior are far from clearly met, but it is possible that one of the more troublesome conflicts can be resolved. This is the requirement that issues be the sole determinant of voting. If this is modified to include nonissue evaluation,
one major stumbling block would be removed. While other problems can still be raised, it may be the assumptions pertaining to the individual's voting decision are more robust than expected.

To the contrary, assumptions associated with equilibrium solutions are unrealistic and lacking in robustness. The equilibrium aspects of ect are disturbing in two aspects. First, the assumptions which produce predictable equilibrium do not appear to reflect reality. Thus far, theorists have not been very successful in producing determinant solutions using less rigid assumptions. Second, the normative implications associated with some of the equilibrium solutions are disturbing. In view of these reservations, some time should be spent explaining why, despite all the doubts about and lack of confirmation of ect, it is still worth pursuing. To accomplish this task, it will be necessary to consider the purposes a theory should serve and the criteria it should be judged by. Theory evaluation from the philosophical perspective will be discussed in the next section.

THEORY EVALUATION

To evaluate ect, it is necessary to discuss scientific theories and explanation. Although theories may have many purposes, in this research, the primary purpose of a theory is explanation. In the following sections, various evaluation
criteria drawn from the philosophy of science literature will be used to determine how well ect explains electoral behavior. Topics discussed include explanation, theory testing, theory falsification and the role of assumptions in prediction.

Explanation

Many political scientists have accepted scientific theories and explanation as the goal to be pursued. A scientific theory should provide a nomological explanation that subsumes what is to be explained under general laws. The part of the explanation that does the explaining (the explanans) is comprised of 1) the general laws and 2) the initial conditions. That which is to be explained (the explanadum) is then deduced from the explanans (see Figure 3 for examples of nomological explanation). Such deductive explanations are powerful because if the general laws are true, the explanation must be true. Nomological explanations account for a fact by showing that it is one instance of a general tendency (Isaak, 1975, pp. 107-08).

There are two types of nomological explanation: deductive and statistical probabilistic. In deductive explanation, when the explanans is true, every instance of the predicted behavior must also be true because the general laws are universal. In statistical probabilistic explanations, on the other hand, no single event can be predicted because the explanation depends
on statistical laws which only indicate the probability that single events will occur. As Isaak (1975, p. 110) notes

...the explanation of universal laws and that of statistical laws exhibit no differences, since in a sense they are both "universal" statements. The distinction is that one states that in a certain universe all individuals exhibit a certain characteristic, while the other states that 60 percent have the attribute. So the tricky facet of statistical explanation is the explanation of the single event.

But even explanation by reference to a law is usually incomplete without a theory. In the examples displayed in Figure 3, it is not clear why rational people select the candidate who is closest to them or why rational people take a central median position. The explanation or "why" is found in a theory.

Although the term theory can be used to mean nothing more than a definition or hypothesized set of relations, the requirements for a scientific theory are more rigorous. A scientific theory has axioms and rules of inference. The axioms usually include a number of auxiliary assumptions and a core axiom which serves as a theoretical premise. Restrictions on candidate mobility, individual's utility functions and the distribution of preferences are examples of auxiliary assumptions. It is the theoretical premise which explains why the political phenomena occur as they do. For example, the theoretical premise in effect is that people act to maximize their utility. For voters, this means choosing the candidate who is closest on the issues and would institute policies the
initial condition: $X$ is a $Y$

voters are rational people

candidates are rational people

general law: all $Y$s are $Z$s

all rational people who vote select candidates who are closest to them on the issues

all rational people who run for office take central median positions on the issues

explanadum: $X$ is a $Z$

voters select the candidate who is closest to them on the issues

candidates take central median positions on the issues

Figure 3

Examples of Nomological Explanation
the voter would benefit from. Candidates maximize utility by taking a median position which appeals to a plurality of the voters and thereby provide the candidate with political office and power. Using the rules of inference, theorems of predictions are deduced from the axioms. Examples of such theorems are the predictions that candidates will take identical issue positions or candidates settle at equilibrium positions.

Proponents of scientific approach in both the natural and social sciences, maintain the purpose of science is to explain and explanation can occur only when there are universal covering laws from which theorems are deduced and behavior is predicted. With perfect knowledge, theories are complete and closed. It is possible to compute the value of any one variable at any time using the laws of the theory and the values of the other variables. In the social sciences, however, knowledge is imperfect and statistical concepts are used to compensate for the imperfection. Rather than predicting an individual event, it is only possible to predict the frequency with which events occur. Despite the lack of perfect knowledge and the inability to predict individual events, predicted behavior can still be deduced from the theoretical premises (Brodbeck, 1968).

Of course, there are critics of the scientific approach who believe that it is possible to have explanation without theories. The critics, who often advocate a humanist approach to explanation, emphasize that explanation or understanding occurs
through processes such as communication, interpreting the actor's intention or interpreting behavior within its social context and these processes have little to do with universal laws or deductive reasoning. In this research, the scientific approach is adopted for examination. Ect makes a particularly good candidate for evaluation since it is sometimes mentioned as one of the best articulated theories in political science. The focus now shifts to the process of theory testing.

Theory Testing

Testing a theory is a complex process in which a number of related controversies exist. The first controversy concerns theory falsification and the adequacy of confirming and disconfirming evidence. The second controversy concerns the role that assumptions and predictions should play in accepting or rejecting theories. While the discussion of these controversies will be general and incomplete, it will be included because philosophers of science have a number of important things to say about theory development and evaluation.

Theory Falsification

The traditional scientific way to test a theory is to compare a theory's predictions with the real world. If one case can be found that is contrary to the prediction, the prediction is rejected and the usefulness of the theory is questioned. If no
example can be found that refutes the prediction the theory is neither rejected nor confirmed. Lakatos (1970) has called this approach to theory testing "dogmatic falsification." Lakatos and Kuhn both reject "...the view that an elegant theory can be killed (or 'falsified') by an ugly fact. Theories are made of sterner stuff, and facts are not so hard and unyielding as classical empiricists had supposed." (Ball, 1976, p. 159)

As the quotation suggests, there are two problems with the dogmatic falsification approach. First, it implies there is a simple distinction between observed facts and theoretical predictions and it is easy to determine if reality conforms to predictions. Unfortunately, perception of "facts" in the real world is influenced by theoretical expectations of reality (Hanson, 1958; Kuhn, 1962; Lakatos, 1970; Davis, 1966; Ball, 1976). Second, both Kuhn (1962) and Lakatos (1970) reject the idea that if a theory or its prediction can be falsified the theory must be rejected. They object that historical evidence indicates that anomalies exist and scientists spend their time and effort trying to solve them.

Kuhn (1962) reacted against the traditional view of scientific change in which theories and their predictions are tested against reality and the incorrect predictions are rejected. Traditional, scientific development was thought to be a cumulative process. Kuhn, however, claimed that the growth of scientific knowledge is occasionally marked by revolutions
in which an old theory or paradigm is rejected and a new paradigm takes its place. Most of the time scientists engage in normal science by pursuing the puzzles or anomalies which the paradigm does not explain. Kuhn maintained it was normal to have some theoretical predictions which did not conform to reality.

Kuhn has been attacked on several grounds, but the criticism pertaining to his description of theory acceptance and rejection as good science is particularly important. He argued that the scientific community determined what good science was using variable and extra-scientific standards. Lakatos rejected Kuhn's contention that theories are accepted or rejected on arbitrary sociological criteria. Lakatos presented his own set of criteria for theory evaluation. A scientific theory is falsified only if a new theory exists 1) which predicts the previously explained facts as well as the old theory did, 2) which predicts new facts the old theory did not and 3) whose new predictions are partially corroborated. Theories go through a series of adjustments and there is actually a series of theories which shares a common core of assumptions. Only by evaluating this series of changes is it possible to determine if the change is progressive and scientific (i.e., meets the three criteria discussed above). Lakatos calls a series of theories a research program. The core assumptions shared by all the theories are the heart of research programs and, by agreement, they are not questioned or
criticized. There is also an auxiliary set of assumptions which is questioned, tested and may be changed. In Lakatos' research programs theories are replaced by better theories. Scientists keep working on anomalies produced by their theories until they can replace it with something better.

Moon (1975) and Ball (1976) have both agreed that the rational choice approach is a well-articulated research program. They identify the program's core assumption as the belief that man is rational and acts to satisfy his preferences. The program produced the anomalous finding that citizens are willing to vote even though they are unlikely to be able to influence the election outcome. Ferejohn and Fiorina (1976) have suggested the anomaly can be explained if theorists adopt a minimax regret strategy. They assume that citizens attempt to minimize the worst situation which can occur rather than attempt to promote the best situation. Citizens vote even though they are unlikely to influence the outcome of an election because they fear that the worst candidate might win by one vote. Moon and Ball point to Ferejohn and Fiorina's adoption of the minimax regret strategy as a progressive problem shift because it solves the puzzle of voter turnout, leaves the core assumption untouched and predicts new facts.

Moon and Ball's analysis of rational choice theory and progressive problem shifts is troublesome. First, other theorists (Ordeshook, 1976; Thorson, 1976) have identified
utility maximization as the core of the theory rather than Moon's more general statement of self-interested behavior. If this is the case, Ferejohn and Fiorina's "progressive problem shift" is actually an assault on the core of the theory. It also seems unlikely that minimax regret will serve as an acceptable adjustment because it fails to predict how individual voters select candidates and how candidates adopt issue strategies. Finally, even in theories limited to the examination of turnout, there is debate about the relative advantages of utility maximization and minimax regret. Page (1977) concludes that neither minimax regret nor utility maximization is completely satisfactory as an explanation of turnout.

These questions about Moon's and Ball's interpretation of minimax regret are raised to suggest 1) Lakatos' scientific criteria can be indiscriminately used to legitimate theories and 2) the hard core or theoretical premise of rational choice theory may not be as easily identifiable as some have suggested. Of course, minimax regret may eventually prove to be the theoretical premise which is needed to explain turnout and candidate selection; but even if the change to minimax regret is progressive, there is still a problem. If minimax regret is only an auxiliary assumption, the hard core assumption is that people behave according to their preferences. Such a premise is neither powerful nor specific. While it is good to have
less restrictive assumptions (Thorson, 1976; Ordeshook, 1976), it is undesirable to have assumptions which are so general and nonspecific that they are compatible with every type of decision strategy from satisficing to utility maximization.

The Role of Assumptions and Predictions

The second controversy related to testing and evaluating theories is concerned with assumptions. A long standing quarrel exists between those who criticize rational theories because the assumptions are unrealistic and those who maintain a theory should be judged by its ability to predict. This dispute raises two questions. First, do the assumptions need to be realistic? Second, how much reliance should be placed on the use of predictions as a tool to evaluate theories?

There does seem to be agreement that rational theories have strong assumptions which are undesirable because they assume a great deal and are unlikely to conform to reality. Theorists prefer to be able to predict as much as possible and make as few assumptions as possible (Thorson, 1976). The disagreement occurs when theorists try to decide whether the existing strong assumptions are essential, avoidable or unimportant.

Theorists who argue that unrealistic assumptions are essential can use different arguments to build their case. Davis (1966, p. 26) uses the argument "All theories are
abstractions from reality. They are by definition unrealistic."
He seems to equate unrealistic assumptions with assumptions
which fail to include some of the less important variables.
Brodbeck has effectively rebutted this argument by noting
that there is a difference between "...not saying everything and
saying what is not so" (1968, p. 460).

Koopmans (1968) argues that assumptions must be unrealistic
in the initial stages of theory construction, but they do not
need to remain so. The primary goal in theory construction is
to correctly establish the logical implications of the axioms and
initial conditions. The process of capturing the crucial
aspects of a more complicated reality in a less complex theory
is a process of gradual approximation. In the initial stages,
it may be necessary to intentionally ignore important aspects
of reality in order to properly establish the relations of the
axioms and their predictions. Empirical verification of the
theory, which is very legitimately concerned with ensuring that
crucial aspects of reality are not ignored, should be important
only after the theory has been constructed.

In evaluating the perspective that theoretical assumptions
must be unrealistic in the initial stages of theory construction,
two points should be made. First, implicit in this view is the
idea that theory construction is an orderly preordained process
in which progress seems almost automatic. The view also draws
quite a sharp distinction between theory construction and theory
testing. Kuhn and Lakatos have both rejected this view of scientific change. Some theories which initially ignore important parts of reality may come to better approximate it, but it is also possible that these theories will never be useful or improve much. Second, even if a theory has the potential to become more realistic, it may be of limited use to political scientists while the discrepancy between theory and reality is great.

Other theorists take the very different view that strong assumptions are both undesirable and avoidable. Ordeshook (1976) suggests weaker assumptions could be used if theorists were not afraid to experiment. As it now stands, most theorists employ strong assumptions because they fear they will be unable to produce equilibrium solutions if they used weaker assumptions. Ordeshook advocates experiments with a type of weaker assumption to produce a bargaining set. While theorists would not always be able to predict which candidate in a bargaining set would win, they could predict that any candidate in the set could defeat a candidate who did not belong to the set.

Friedman (1953) takes a third and very different view of the role assumptions should play in testing theories. He argues that the realism of the assumptions is unimportant because a theory should be judged by its ability to predict. Friedman's argument can be interpreted in various ways. It is logically valid to refute a theory if its predictions are incorrect. For example,
If Theory (T) is true, then Prediction (P) follows
P does not occur
Therefore, infer T is not true.

When researchers assume that correct predictions validate a theory, their assumption is based on a logical fallacy which is called the fallacy of the affirming consequent:
If Theory (T) is true, then Prediction (P) follows
P occurs
therefore, infer T is true.

This is logically invalid. While repeated confirmation of a theory's predictions gradually provide support for the theory, it is not equivalent to deductive proof that the theory is true. Repeated confirmation of the prediction is an inductive means of providing support for the theoretical premise.

Evaluation of Electoral Competition Theory

In this section some of the basic questions and controversies about theory evaluation are considered. In particular, seven questions will be discussed:

1) Does it matter whether assumptions are unrealistic?
2) Are the assumptions of ect unrealistic?
3) Are the auxiliary assumptions of ect realistic?
4) Do rational choice theories qualify as deductive theories which provide nomological explanation?
5) How do predictions serve as a test of ect?
6) Should an attempt be made to test a theory's core premise?

7) How do you define theoretical progress and when do you replace one theory with another?

Answers to these questions will be used as criteria with which to evaluate eect.

A good place to start is the assumptions. One question might be does it matter whether assumptions are unrealistic? It appears that the answer must be yes. At minimum, the core theoretical premise from which deductions are made must be true and realistic. A second question becomes does eect meet this criterion? The answer is unclear. One problem concerns disagreement about what the theoretical premise is. In this research the core is presumed to be utility maximization, but Moe (1979), Moon (1975) and Ball (1976) would dispute this. Even if the presumption is correct, there is no definitive evidence that citizens are utility maximizers. There is, however, some evidence to suggest that stochastic theories of utility maximization explain reality and it is concluded this is sufficient to retain the premise.

A third question might focus on how closely auxiliary assumptions conform to reality. If there is little congruence between an assumption and reality, it is not too serious a problem because the assumption can be discarded without compromising the theory. Even so, it is necessary to decide which assumptions should be discarded and which should be retained. The researcher needs to use his judgment to determine
if the auxiliary assumption approximates some essential aspect of reality. If assumptions are so specific they lack robustness, this is one warning signal the assumptions should receive close scrutiny. Fiorina (1975, p. 153) specifically cautions

If certain variables are assumed to follow particular probability distributions, or if variables are assumed to be related via specific functional forms, then hard questions should be asked. Do we have evidence...that the specific distributions or functions forms are justified? If not, we should be skeptical of the conclusions of the model, for they may be totally dependent on the distributions or functional forms assumed. Slight perturbations of the assumptions could alter the conclusions drastically.

Fiorina says specific assumptions may be correct and necessary, but they should be examined carefully. The assumptions pertaining to individual level decision-making appear more realistic and robust than the assumptions pertaining to candidates' issue strategies. The later assumptions do depend on highly specific distributions of preference and utility functions. As far as possible, data will be used to examine the auxiliary assumptions in a later chapter.

A fourth question, raised by Moe (1979), is whether rational theories are really deductive theories which provide nomological explanation. His answer to the question is no, but he suggests they still serve a useful purpose. Rational theories are, in Moe's view, pre-theories which aid conceptualization, facilitate analysis by simplifying, point to relevant
relations and forecast behavior. The theories do not provide predictions or explanations because they do not derive from axioms.

Moe bases his conclusions on the argument that rational choice theories do not have a theoretical core. He maintains that its assumptions, which are unrealistic, are tucked away in antecedent clauses. Moe's conclusion is rejected on the basis that utility maximization serves as a theoretical core. Furthermore, there is enough evidence to support utility maximization and some of the auxiliary assumptions (especially those pertaining to individual's voting decisions) so that there is no reason to reject utility on the basis of its assumptions.

A fifth question pertains to the role of predictions as a test of a theory. In the later chapters, correct prediction about the individual's voting choice and the candidate's issue strategy will constitute partial confirmation of the theory. Certainly it would be more desirable to provide validation of a theory which would then ensure the theory's predictions must hold. The following provides an example of logical validation of the predictions.

if Theory (T) is true, then Prediction (P) follows

T is true

therefore, infer P follows

Unfortunately, social scientists have been unable to completely validate their theories. Researchers are forced to determine
if assumptions are realistic, to try to provide empirical
confirmation or rejection for the predictions and to search
for changes in auxiliary assumptions that will produce new
predictions.

A sixth question is whether a direct test of the theory's
core premise should be attempted. It was just indicated that
it is not possible to provide incontrovertible proof of a
theory's validity, but Lakatos (1970) goes so far as to
maintain the theoretical core should not be questioned or
tested. However, in deductive theories the theoretical premise is
the linchpin on which the theory rests. The premise needs to be
carefully examined since so much of the remaining theory depends
on it. As reported earlier, the psychologists' research on
utility maximization provides ambiguous evidence about electoral
competition theory's core premise. Enough supportive evidence
has been produced to retain the premise.

The answer to the sixth question also answers the seventh
question. The seventh question is how do you define
theoretical progress and, conversely, when do you replace one
theory with another. Lakatos (1970) argues you do not reject
one theory until there is a better theory to replace it with.
This guideline was applied to the evaluation of the theoretical
premise of ect. Even though there is only partial support for
utility maximization, it is maintained as the premise for
lack of a better replacement. Lakatos' guideline is reasonable
and useful. Unfortunately, it is not clear that it is much beyond that; in fact, this guideline could be used as a justification and rationale for retaining a core premise even when there is little reason to do so. Since it is so essential that the theoretical core of a deductive theory be valid, this tendency could be a serious problem.

A general evaluation of ect might make these points. First, the theory does not seem to be as specifically defined as you might expect. Theorists have explicitly tried to make their assumptions known and to write their theories in precise mathematical language. Yet, there are some very basic controversies over how realistic the assumptions are and ought to be. There is also basic disagreement about what the core or theoretical premise is. These, of course, are the negative evaluations of ect. On the more promising side, it is argued that ect is a deductive theory based on a theoretical premise which produces predictions about individual's voting choices and candidate's issue strategies. Although some of the assumptions appear unrealistic, there is at least partial confirmation of the theoretical core and the assumptions pertaining to individual electoral choice. Ect is the only electoral theory which provides the "why explanation" for such a wide range of behavior.
SUMMARY AND CONCLUSIONS

Literature from political science, economics, psychology and the philosophy of science has been examined in this chapter. This final section will be an attempt to summarize and discuss the implications of this literature for the evaluation and development of electoral competition theory.

One very basic controversy which was discussed pertains to the confirmation or falsification of a theory through its predictions. Philosophers who evaluate theories have long agreed that theories are not confirmed; rather, negative evidence may result in the rejection of the theory while positive evidence only serves to allow the scientist to retain (but not confirm) the theory. Recently, Kuhn (1962) and Lakatos (1970) suggested that theories are not casually rejected. Much of Lakatos' perspective has been adopted in this analysis. This means that even though evidence does not support a theory (and may partially refute it) theories are not rejected unless there is a better replacement theory available.

Since this is a less than a complete guide to theory evaluation and development, it was necessary to examine the role of axioms. Although considerable controversy exists, the following conclusions were reached. It is important to have axioms which are congruent with reality. Although the congruence does not have to be complete, it needs to be
substantial. The elements of reality may be excluded from a
theory, but the theory should not contradict reality. Using
Lakatos' distinction between core and auxiliary axioms (1970), it
was decided that it is particularly important that core axioms be
realistic since the deductions are made from them. The theory is
not threatened if auxiliary assumptions are unrealistic but it is
necessary to be able to spot the unrealistic auxiliary assumptions
and replace them. Contrary to Lakatos' admonition, there is no
prohibition against questioning and testing the theoretical premise.

To determine how well ect explains electoral behavior, it was
necessary to describe its axioms and predictions. Ect's axioms
were analyzed in three separate sections: the core axiom, the
auxiliary assumptions related to the voter's decision and the
auxiliary assumptions related to candidate's issue strategies.
For convenience, conclusions about the last set of axioms will
be discussed first.

Most electoral competition theorists prefer predictable
candidate positions and specify assumptions which produce centrist
equilibrium solutions. They assume that when two candidates
have similar positions at the center of the distribution,
they are responding to the mean issue preferences of the
citizens. The winning candidate will carry out the most
preferred policies. With this theory, it makes little or
no difference which candidate wins. Electoral competition
pushes the candidates toward the same or identical positions;
candidates who adopt similar positions are being responsive
to public opinion. Yet, other political scientists have different
ideas about the role of competition and candidate responsiveness.
Sundquist (1973) describes a political party system in which
parties compete by taking opposing positions on controversial
issues. Candidates respond to public opinion by taking differing
issue positions.

There is little justification for rejecting an explanatory
theory because its implications are unpalatable, but additional
arguments can be made for the rejection (or modification) of the
issue strategies axioms. These assumptions require very specific
utility functions and distributions of preferences. If citizen
preferences do not conform to these stringent requirements,
the predicted behavior (in this case, the centrist equilibrium
positions) may not occur. Also, it must be remembered that
the conclusions about centrist equilibria are reached at
least partially because theorists want to produce solutions
in which they can predict the candidate's positions. One
assumption that contributes to centrist solutions is the
unlimited mobility assumption. When it is not used there is a
greater likelihood that candidates will not take centrist positions.

The core axiom and the assumptions pertaining to the voter's
decision will be discussed more as a unit since they are less
objectionable. In this research, the theoretical premise is
that citizens act to promote their self-interest by trying to
maximize their utility. The theoretical premise is particularly important. It differs from other assumptions because its primary purpose is to explain why the behavior predicted by the theory occurs. In doing so, of course, it sets a requirement which must be met (i.e., people must be utility maximizers). Some have suggested that the theoretical premise should be self-interested behavior. This suggestion has been rejected because the premise would then be so general that it would be congruent with a seemingly unlimited number of decision-making rules. This congruence would make refutation of the theory extremely difficult. Self-interested behavior has also been rejected because electoral competition theory's predictions about candidates' issue strategies and voters' decisions depend on utility maximization.

The validity of the theoretical premise is especially important because so much of the rest of the theory depends on it. Experimental evidence produced by psychologists partially substantiates utility maximization. While it must be acknowledged that this support is ambiguous, the same is true for the evidence which refutes the theory. On this basis, it is concluded that utility maximization should be retained as the theoretical core.

The auxiliary assumptions pertaining to individual's voting decisions produce partial explanations of voting behavior and set requirements which must be met if the predictions are to
occur. These assumptions have already been described. Most of the axioms are concerned with the process that citizens use to evaluate issues. On the basis of substantial empirical evidence, however, it seems likely that electoral decisions are not made solely on the basis of issues.

Despite the ambiguities and controversies, it is concluded that electoral competition theory 1) provides better explanation of electoral behavior than any other theory, 2) is sufficiently supported by evidence to be retained for further testing and 3) qualifies (in an imperfect sense) as a deductive theory which provides nomological explanation. First, it is better because it offers the "why explanation" which is missing from most of the empirically derived theories of voting. Second, there is at least partial confirmation of many of the theory's axioms and predictions. Some of the less well supported axioms, such as those which emphasize the importance of issues, can be modified. Other axioms may require more drastic actions. It is not clear if assumptions pertaining to issue strategies should be rejected or modified. Third, it qualifies as deductive because it is possible to specify the axioms from which predicted behavior is deduced. It also supplies the rationale for individual's behavior.

This conclusion is more optimistic than early analysis of the individual assumptions might seem to warrant. The optimism is based more on ecst's future promise than on strict
confirmation of its axioms. The optimism also reflects the recognition of the difficulties associated with theory evaluation and development and the small number of attempts which have been made to validate the assumptions and predictions. Lakatos' conclusion and admonition that theories should not be casually rejected is convenient; it is also more rooted in common sense than strict scientific goals. Still, faced with the prospect of using ect or tracing the determinants of the vote, ect is a reasonable alternative to be pursued.
Endnotes

1 The relative merits of utility maximization and minimax regret as explanations of voter turnout are a matter of dispute. Since voter turnout rates are not the subject of this research, no attempt will be made to present the arguments.

2 Issue proximity questions or 7-point questions ask a respondent to place himself and the candidates on a 7-point scale. Opposite positions on an issue are indicated at each end of the scale.

3 Actually utility functions may be concave, quadratic or quasi-quadratic (Riker and Ordeshook, 1970). Concavity occurs when movement away from the respondent's ideal point (in either direction) produces an increasing decline in utility. Since there is no requirement of symmetry, movement equal distances to the left (d') and the right (d'') from the ideal point does not have to produce equal decrease in utility.

![Diagram showing concave utility functions and policy alternatives](image)
An individual with a quadratic utility function will receive the same decrease in utility when he moves equal distances left or right from this ideal point. In a word, the function is symmetric. The change in utility must decrease at an increasing rate so that the \( d' \) movement from the bottom of the curve produces more decrease in utility than \( d'' \) movement in the middle of the curve. Likewise, \( d'' \) movement from the middle of the curve produces more decrease in utility than \( d''' \) movement from the top of the curve.

\[
\begin{align*}
\text{utility} & \\
u''' & \quad u'' & \quad u'
\end{align*}
\]

\[
\begin{align*}
d' &= d'' = d'''
\end{align*}
\]

\[
\begin{align*}
u' &> u'' > u'''
\end{align*}
\]

A quasi-quadratic utility function is symmetric but the rate of change is variable. Thus, a large movement away from the ideal point at the top of the curve (\( d' \)) does not produce much change in utility while the same amount of movement at with end of the curve (\( d'' \)) produces a drastic decrease in utility.
Lakatos (1970) distinguished between the negative heuristic or the core of the theory which should not be challenged and the positive heuristic which is open to challenge and testing. Using Lakatos' categorization, Moon (1975) identified self-interest as the negative heuristic in rational choice theories. In this analysis, the negative heuristic is identified as utility maximization which is a specific type of self-interested behavior.

Brodbeck (1968) discusses and refutes critics of humanist explanation while Moon (1975) suggests incorporating elements of both the scientific and humanist approaches into explanation.

Critics object to the scientific approach on two bases. First, they argue that understanding comes from communication rather than description. When two people share a "essential sameness" after communicating about an event, understanding and explanation of that event exists (Brodbeck, 1968). Laws or premises are true by shared meaning and no further explanation of them is necessary or possible. Brodbeck disagrees. She maintains that this sense of understanding fails to provide a
justification or reason why an event did occur. Furthermore, Brodbeck maintains that explanation does not indicate how correct inferences are to be made from the understanding and explanation so that past and future behavior can be understood.

Second, critics emphasize that laws are not necessary since concepts are sufficient to explain and understand if they are interpreted properly. Proper interpretation comes from observing an actor's behavior to determine why he performed it and what the action means. Since actions are taken in the social context of aims and cognitions, they should be interpreted within this context. Critics feel the scientific approach places too much emphasis on the instrumental or intentional nature of behavior; in fact, a great deal of behavior is conventional and can be understood as such. Brodbeck flatly rejects the idea that concepts get their meaning from the context in which they occur. If this were the case, the relevant context would continually change and people would use the same concepts in different ways. Moon does not completely reject contextual interpretation, but he does admit that explanation which depends on the particular context makes comparison and generalization difficult. Moon believes that gross characteristics of political systems rarely result from the intentions of individuals.

Ball (1976) described some of the criticisms lodged against Kuhn. His critics have charged that Kuhn took a position of strict incommensurability which made the comparison of the
relative strengths and weaknesses of two different theories impossible. Kuhn maintains that his position, which was never that extreme, allowed partial comparison of theories. Critics insist that paradigms change is more gradual than Kuhn indicates.

Ferejohn and Fiorina (1976) use minimax regret to predict that in a three party race, citizens will not vote for their second choice candidate even when the least preferred candidate is likely to win.
CHAPTER 3

METHODOLOGY

INTRODUCTION

Electoral competition theory's (ect) predictions that
1) voters maximize their utility by choosing the candidate whose
issue positions are closer to their own, and 2) candidates
maximize their utility by adopting centrist issue positions
which are at an equilibrium, are tested in chapters 4, 5 and 6.
The purpose of this chapter is to provide an explanation of the
analysis which will be used to test the theory. Since utility
maximization is defined in terms of spatial location, the
predictions will be tested by producing electoral spaces which
indicate the relative proximity of candidates and voters.
While several variables and scaling techniques have been used
to produce different electoral spaces (Weisberg and Rusk, 1970;
Rusk and Weisberg, 1976; Aldrich and McElvee, 1977; Rabinowitz,
1978), there has been little analysis of what the different
types of electoral spaces actually measure. In the first section
of this chapter there will be a discussion of the desirable
characteristics a space should have and the types of variables and statistical techniques which will produce such spaces. In the second section there will be a description of the techniques chosen to produce the electoral spaces in this analysis.

SPATIAL ATTRIBUTES

To serve as a test of ect, an electoral space should have the following characteristics:

1. Both candidates and voters should be arrayed in the space.

2. The placement of candidates in the space should be determined by the issue distance between each respondent and each candidate so that the closer a candidate and voter are, the more the voter prefers the candidate's issue position.

3. The candidates' issue positions should be organized along an underlying issue structure rather than a more general structure of broad political cleavages.

These characteristics will now be discussed in greater detail. First, it is necessary to have both candidates and voters in the space to determine if citizens do vote for the closer candidate. Second, the placement of candidates in the space should be determined by the distance between their issue positions and those of the voters. The more the voter prefers the candidate's stance on the issues, the closer the voter and candidate should be. In a space organized on this basis it would
be possible to determine if candidates take centrist positions (i.e., positions close to many voters).

Third, the candidates' issue positions should be organized along an underlying issue structure rather than a general structure of broad political cleavages. There is no problem in producing spaces in which candidates are organized in some way according to issues. Spaces already exist in which candidates are arranged on the basis of general political cleavages. For example, Weisberg and Rusk (1970 and 1976) and Rabinowitz (1978) produced spaces in which presidential hopefuls were arrayed on some of the following cleavages: traditional partisanship, new social conflict (i.e., drugs, women's rights, etc.) and the government's role in influencing the economy and social climate. Although this is a very reasonable way for voters to organize their perceptions about candidates, such spaces do not work well to test because the underlying organization is more a representation of broad political conflicts than an indication of the voters' preferences for candidates' positions. For example, a peripheral position on one of these dimensions does not necessarily mean the candidate has taken a radical issue position. If Ford were placed at the far end of a Democratic-Republican dimension, this could simply mean he is perceived to be a "good Republican" who supports traditional Republican policies. It would not necessarily indicate he supports radical policies which are disliked by a large number
of voters.

Figure 4 illustrates a hypothetical space in which candidates are arrayed along broad political cleavages. The first dimension represents conflicting views on the role of government in promoting a minimum standard of living. Candidate Y is located at one end of the dimension because of his support for tax incentives for parents of young children to work, privately run job training programs and cuts in the food stamp program. Candidate X's programs are found at the opposite end of this dimension since he favors an enlarged food stamp program, government sponsored day care programs for the children of working parents and government sponsored job training programs.

The second dimension represents the basic conflict between those who favor a strong military posture in world affairs and those who prefer to help other countries to look after their own interests. Thus, Candidate X who expressed a reluctance to intervene in other country's affairs, supported limited US defense spending and encouraged other countries to develop their own military forces would be located at the extreme on this dimension. Candidate Y is found at the other end of the dimension with support for a strong US military presence in those parts of the world vital to US interests, increased defense expenditures and a series of treaty obligations to come to the defense of threatened allies.
Figure 4

Hypothetical Space Arranged According to Broad Political Cleavages
Figure 5 illustrates a two dimensional space with an underlying issue structure, with spending and economic positions being arrayed on dimension 1. Candidate X's positions on job training, aid to families with children and medical benefits are located at one end of this dimension since he is perceived to have extreme positions. Candidate Y's positions are located nearer the center since he supports the maintenance of existing welfare programs although he may favor moderate decreases in spending and attempts to make such programs operate efficiently. Various civil liberties issues are located on the second dimension which ranges from protection of individual rights to protection of society's rights. Again, Candidate X's positions are located toward the individuals' rights end of the dimension because of the candidate's support of the rights of blacks, women and those accused of crimes. Most of Candidate Y's positions are located toward the center of the civil liberties dimension. The one extreme position that Candidate Y takes is his position on the rights of the accused.

Although the spaces illustrated in Figures 4 and 5 both serve to organize issue positions, there is one basic difference between them. In Figure 4 the candidate's positions will tend to be located at the ends of the dimensions because each end of the dimension represents one of the two distinct alternatives that is available on a group of issues. The primary organization of the space is the relation of candidates
Figure 5

Hypothetical Space with Underlying Issue Structure
to each side of the political cleavage. In Figure 5 candidates may be located at either central or peripheral locations on the dimensions depending how close or far the candidate's position is from the positions of the voters. If all the candidates had taken positions distinctly different than the voters' median position, they would have been located toward the end of the dimensions and Figures 4 and 5 would be difficult to distinguish. It is necessary to have a space which allows candidates to take a central location when his position is similar to the median voter position. Only if this type of central location exists is it possible to talk about strategies candidates might use to maximize their share of the vote.

DATA AND METHODS

The goal is to produce a space in which candidate and voter locations represent the spatial proximity of these political actors on issues. The problem is to determine which variables and statistical techniques will produce such a space.

Rusk and Weisberg (1976, p. 374, footnote 5) have suggested that a multidimensional scaling (MDS) analysis based on correlations of candidate pairs is likely to produce spaces organized along broad dimensions of political conflict while MDS based on individual's preference orders produce spaces which represent spatial proximity between candidates and voters.
In fact, analyses using both correlations (Weisberg and Rusk, 1970 and 1976) and ranked individual preferences (Rabinowitz, 1978) have produced broad political dimensions of conflict. The production of dimensions representing broad political conflict is probably more the result of the selection of the candidate evaluation variable than the statistical technique.

The candidate evaluation variables used in the Rusk-Weisberg and Rabinowitz analyses are candidate thermometer score questions. These questions ask a respondent to indicate how warm or cold they feel toward a candidate by giving each candidate a score which can range from 0 to 100 degrees. The higher a thermometer score is the more positive the evaluation is. This type of question does not impose the issue evaluation criteria on the respondent; rather, the citizen can evaluate the candidate on any basis he chooses: partisanship, ideology, issues or personality.

A decision was made not to use the thermometer scores in this analysis because they have the potential to incorporate too many diffuse nonissue evaluation criteria. While candidate evaluations will be reintroduced into the candidate spaces later in this research (see chapter 5), separate issue evaluations and candidate evaluations will come from different variables so it will be possible to better sort out the effects of each.

The seven point issue variables focus the voters' evaluations on issue criteria. Respondents are asked to place
candidates and themselves on a seven point scale bounded by opposite positions on an issue. For example, on the busing question, respondents are asked if a candidate supports busing to integrate schools, neighborhood schools or one of the five intermediate positions on the scale. Respondents also place themselves on the scale. If a respondent places himself in the middle of the busing scale (the number 4 position, see Figure 6) and perceives candidate A at the pro busing extreme the issue distance between the respondent and candidate A is 3 \((1 - 4 = |3|)\) and the issue distance between the respondent and candidate B is 3 \((7 - 4 = |3|)\). The unsigned distance between each respondent's position and each candidate's position is calculated on every issue.

Although it is possible that the candidate position variable itself could be analyzed (a strategy used by Aldrich and McKelvey, 1977), there is a problem with this type of analysis.
Once the perceived candidate positions have been scaled, it is not obvious how the respondents' scaled positions are related to the candidate's scaled positions. Since the two separate scales do not necessarily have equivalent means or end points, a way must be found to merge the spaces. The solution (Aldrich and McKelvey, 1977) has been to standardize the two scales so the mid-point of each is the mean voter position on one issue. Once this has been done, the scales are merged so the relative voter and candidate positions can be compared.

In this analysis issue distance variables are used so that candidates who are close to many voters are centrally located and candidates who are far from the issue positions of many voters are placed on the periphery. In this way, relative location of voters and candidates is introduced directly into a space which contains only candidates. After this candidate space is produced, the voters are then placed near candidates they prefer (i.e., candidates having similar issue positions to their own). Since the voters' preferences are clear, the task in placing voters in the space is to maximize the congruence between candidate location in the space and each voter's preference for the candidates.

The Basic Steps in the Analysis

Before the different stages in the analysis are described in detail, an overview of the process used to create the
candidate-voter spaces will be provided. There was no scaling program available that would simultaneously scale the respondents and the candidates in the same space on the basis of the unsigned issue variables just described. The best existing alternative was to use multidimensional scaling to locate the candidates in the space, and then use a program written by Rabinowitz to locate voters in the space. However, the use of the multidimensional scaling program imposes its own requirements: a similarity matrix. In this analysis a matrix is needed which represents the similarity of candidate positions on different issues so that the pair of issues which is most similar can be placed closest together and the pair of issues that is least similar can be located farthest apart. To obtain the similarity matrix of candidate positions, another program written by Rabinowitz was used. This program treats the unsigned issue distances as proxies for the voter's closeness to the candidate on that issue (just as Rabinowitz [1978] used the program on candidate thermometer scores as proxies for the voter's overall closeness to the candidate). As a result of these considerations, the following analysis sequence was adopted:

1. After the ten unsigned issue distance variables were created, Rabinowitz's line of sight (LOS) program was used to indicate how different or similar the candidate's positions on the five issues are. To measure the 10 different issue distance variables
(i.e., Nixon's five issue positions and McGovern's five issue positions), all 45 possible pairs of the 10 variables are compared and ranked from most similar to least similar. This constitutes the similarity ranking for the next stage of the operation.

2. These similarity measures (the rank orderings of the 45 pairs of candidate issue positions) are placed in an input matrix which is scaled with Kruskal's nonmetric multidimensional scaling (MDS) program. The MDS program constructs a space in which similar pairs of candidate positions are placed close together while dissimilar pairs of candidate positions are placed far apart. This yields the candidate-issue space which is necessary for the final stage of the analysis.

3. Once the candidate-issue space is obtained, voters are situated in that space such that each voter is close to a candidate's issue position when the voter and candidate have similar positions. Rabinowitz's nonmetric scoring (NMSCORE) program is used to locate voters in the space. This candidate-voter space can be examined to test the degree to which citizens vote for the candidate closest to them, as well as the degree to which candidates choose spatial locations near the most possible voters.
Each of these analysis steps requires some greater discussion and elaboration, and that will be provided in the sections that follow.

The Line-of-Sight Technique for Measuring the Similarity of the Pairs of Candidates' Issue Positions

Once the unsigned issue distance variables were created, it was necessary to decide whether to use correlation coefficients or a rank ordering of the voters' preference orders as input for a scaling program. The rank ordered preferences were chosen because they are a better measure of spatial proximity than correlation coefficients. Rusk and Weisberg (1976, p. 374, footnote 4) suggest that "...a space based directly on the individual preference orders would be better suited for describing the distribution of voters in the candidate space and discussing the candidate strategies in competing in that space." Jones (1974) has provided evidence that correlation coefficients are biased measures of spatial proximity.

Rabinowitz's line-of-sight program (1973) will be used to rank the data because it has been shown to produce unbiased rankings even when the data contains a considerable amount of random response. As indicated earlier, the line-of-sight program ranks all 45 possible pairs of the issue distance variables from the pair that is most similar to the pair that is least similar. The following are examples of pairs that
would be ranked most and least similar. If the voters report that they find McGovern's positions on busing and marijuana closer to their own positions on these two issues than any other two issues, this pair of issue distances would be ranked first as the most similar. A pair would rank 45th or least similar if it were comprised of the one issue on which voters and candidates were in most agreement on and the other issue on which voters and candidates were in the most disagreement on. For example, if 1) McGovern's busing position is farther from the voters' busing position than any other candidate's position is from the voter's position and 2) Nixon's Vietnam position is closer to the voter's Vietnam position than any other candidate's position is to the voters' position then the McGovern busing/ Nixon Vietnam pair would be least similar.

Table 1 indicates the 45 possible pairs of issues. The numbers in this table are organized so that the same candidate pairs (i.e., McGovern Busing/McGovern Inflation or Nixon Marijuana/Nixon Vietnam) have the lowest numbers and are most similar while the different-candidate pairs (such as McGovern Busing/Nixon Inflation) have the highest numbers and are least similar. This numbering scheme illustrates that general trend which will be present in the analysis: one candidate's issue positions are more similar to each other than they are similar to the opponent's positions.
Table 1
Illustration of the 45 Possible Comparisons of 10 Issue Distance Variables

<table>
<thead>
<tr>
<th></th>
<th>McGovern</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Nixon</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Busing</td>
<td>Vietnam</td>
<td>Infation</td>
<td>Marijuana</td>
<td></td>
<td>Busing</td>
<td>Vietnam</td>
<td>Infation</td>
</tr>
<tr>
<td>McGovern</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Busing</td>
<td>-</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov Guar</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
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<td>6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marijuana</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Nixon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Busing</td>
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<td>26</td>
<td>31</td>
<td>36</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>22</td>
<td>27</td>
<td>32</td>
<td>37</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov Guar</td>
<td>23</td>
<td>28</td>
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<td>38</td>
<td>43</td>
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<td></td>
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<td>Inflation</td>
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<td>29</td>
<td>34</td>
<td>39</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Marijuana</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
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<td></td>
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</tr>
</tbody>
</table>
The LOS program compares pairs of issue distance variables to measure the similarity and dissimilarity of the data as required by MDS. To demonstrate how the procedure operates, Table 2 provides for an example of 5 individual's evaluations on three candidate issue positions: V1, V2 and V3. These three variables are paired and manipulated to create the sum of each pair and the absolute difference between the variables in each pair (see Table 3). For example, if the first issue distance variable equals 0 and the second issue distance variable equals 3, the sum of the pair is 3 and the difference is 3. The use of both the sums and differences avoids any bias which could result from use of only one of the statistics (Rabinowitz, 1973). The data in Table 3 have been transformed to an individual-variable pair format such that for each pair of variables each respondent has a sum and a difference.

Table 2

Individual-Variable Format for Issue Distance Variables

<table>
<thead>
<tr>
<th>Individual</th>
<th>Issue Distance Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V1</td>
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<tr>
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</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
Table 3

Individual-Variable Pair Format for Issue Distance Variables

<table>
<thead>
<tr>
<th>Individual</th>
<th>Absolute Differences</th>
<th>Sums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pair</td>
<td>Pair</td>
</tr>
<tr>
<td></td>
<td>V1-2</td>
<td>V1-3</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
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<tr>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

In Table 4 the data are converted to a level-variable pair format. This conversion is made so that the largest difference for each pair can be combined with the smallest sum for each pair even though the same respondent may not have been responsible for producing these extremes. From this point in the LOS program, the analysis will proceed so that values of the pairs in each level will be manipulated. In order to convert the data to the level-variable pair format the columns in Table 3 are sorted from largest to smallest and the results are displayed in Table 4. The difference columns are displayed from the largest to smallest and the sums columns are displayed from smallest to largest.

The next step is the combination of differences and sums in each row for each pair (see Table 5) so that the largest
Table 4

Level-Variable Pair Format for Issue Distance Variables

<table>
<thead>
<tr>
<th>Level</th>
<th>Absolute Differences</th>
<th>Sums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pair V1-2</td>
<td>Pair V1-3</td>
</tr>
<tr>
<td>1</td>
<td>largest</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>smallest</td>
<td>0</td>
</tr>
</tbody>
</table>

difference is combined with the smallest sum for each pair (level 1), the second largest difference is combined with the second smallest sum (level 2) and so on. Rabinowitz (1973) says this sorting and recombination of the extremely large and small values of the pairs is essential if an accurate similarity ranking is to be produced.

The values in Table 5 are ready for rank ordering. The rank ordering process is necessary to indicate how similar the pairs of variables are so they can be scaled. The rank ordering is an iterative process in which only the larger differences between pairs and the smaller sums of pairs are used to produce the similarity ranking. First, a pair's largest difference and smallest sum are combined, then the next largest difference and next smallest sum are combined and so on. The iterative process of gradually adding more levels of data continues until
certain parameters (see below) are satisfied.

<table>
<thead>
<tr>
<th>Level</th>
<th>Pair Vl-2</th>
<th>Pair Vl-3</th>
<th>Pair V2-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
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</tr>
<tr>
<td>5</td>
<td>9</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 5
Combination of Largest Differences and Smallest Sums

On the first iteration (see Table 6) the values from level 1 of Table 5 are identified as the Combined Values 1 and they are ranked. The ranking is based on the assumption that pairs with a smaller combined sum and difference are more similar while pairs
with a larger combined sum and difference are less similar.

There are three parameters which are used to determine when
the iterative process should be stopped and the rankings should
be accepted. The parameters are ADEQU, DENSE and DISCRIM. These
parameters will be explained although none of them need be
computed on the first iteration.

The LOS program is more accurate when the ranking is
based only on the largest differences and smallest sums so that
95% or more of the responses are never used in the analysis
(Rabinowitz, 1973). While it is desirable to use fewer levels
in the analysis (and thereby use only a small proportion of
the data), it is also necessary to be able to discriminate among
the pairs of variables so there are few pairs tied for the same
rank. The ADEQU parameter is used to determine when the iterative
process has produced a rank ordering of variables which
discriminates well and yet is based on a few levels of data.
The parameter is defined as

\[
\text{ADEQU} = \text{DISCRIM} \times \text{DENSE}^{\text{EXPO}}
\]

such that

\[
\text{DISCRIM} = \frac{\text{number of distinct rank positions} - 1}{\text{total number of pairs} - 1}
\]

\[
\text{DENSE} = \frac{\text{sample size} - \text{number of levels used}}{\text{sample size} - 1}
\]

\[
\text{EXPO} = \text{exponent for the density term (usually equals 1)}.
\]
High decimal values are desirable for both DISCRIM and DENSE. A high DISCRIM value indicates there are few ties and a high value for DENSE indicates that few levels have been used. The DENSE level should usually be .97 or greater (and it definitely should not drop below .95). By maximizing the product of DENSE and DISCRIM (i.e., the ADEQU parameter), the iteration process is stopped when there is a balance between few ties and few levels.

Since Table 6 represented only the first iteration, the process will proceed to the second iteration (see Table 7). In this iteration the Combined Values 1 in Table 6 are added to the second level in Table 5 to produce Combined Values 2. Table 7 lists the ranking and the values of the DISCRIM, DENSE and ADEQU parameters. Since the DENSE value is low (.75) and ADEQU has not had an opportunity to stabilize at a high value, the iterative process will continue. The iterative process continues so that the values in the successive levels of Table 5 are added to the combined values of the previous iterative stage. Eventually the ADEQU parameter should reach a high stable value and the DENSE parameter should have a value of .97 or higher. Once the iterative process has reached this stage, a fourth parameter, DIFF-SUM RHO is computed.

DIFF-SUM RHO indicates whether a basic assumption of the process is met. It is assumed that the best way to determine if a pair of variables is similar is to examine both the sum
Table 7
The Rank Orderings of Issue Pairs on the Second Iteration

<table>
<thead>
<tr>
<th>Pair</th>
<th>Pair V1-2</th>
<th>Pair V1-3</th>
<th>Pair V2-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Values 2</td>
<td>10</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Ranking</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

DISCRIM = 3-1/3-1 = 2/2 = 1.0
DENSE = 5-2/5-1 = 3/4 = .75
ADEQU = 1.0 X (.75)^1 = .75

and the difference between the two variables. Although the two separate measures produce somewhat different rankings, the ranking using only sums and the ranking using only differences should be correlated. To test this assumption, Spearman's rho is used to correlate the two separate rankings. If the DIFF-SUM RHO falls below .4, the assumption is not being satisfied, but if it is greater than .4 the rankings can be used as input for the multidimensional scaling.

In summary, LOS is an appropriate ranking procedure to use because it handles the errors in survey data well. It compares pairs of issue distance variables on their sums and their absolute differences. The use of both sums and differences avoids biases that might occur if only one of the statistics was used to rank the pairs (Rabinowitz, 1973). The LOS program is more accurate when the ranking is based only on the largest
differences and smallest sums so the data are converted from individual level data to variable level data. The rankings are then computed from about 5% of the data via an iterative process which continues until the ADEQU parameter (which measures the balance between ties among the ranks and the number of levels of data used) stabilizes. In order for the rankings to be acceptable, the DENSE parameter should be .97 or greater and the DIFF-SUM RHO should be .4 or greater.

Even after LOS produces a matrix which meets the requirements listed in the paragraph above, the matrix may not be suitable to use as input for MDS. As mentioned earlier, there is a tendency for the same-candidate pairs of issue distances to be so similar to each other that MDS cannot produce suitable candidate space. When the candidate separation in the LOS matrix is complete (i.e., when all of the same-candidate pairs are more similar than any of the different-candidate pairs), a "perfect" solution can always be obtained by locating all of one candidate's positions at the same point at one end of a dimension and all the other candidate's positions at one point on the opposite end of the same dimension (see Figure 7). This seemingly perfect unidimensional solution will be produced even though a multidimensional solution would emerge if even one or two of the same-candidate pairs were less similar than any one of the different-candidate pairs. In such a degenerate solution the distance between each candidate's own
positions will be 0 and the distance between any of the first candidate’s positions and any of his opponent’s positions will be 1.0. These distances have a monotonic relation with each other, the stress will be zero and the solution will appear perfect even though it is actually degenerate.

The Multidimensional Scaling Technique

Once a suitable LOS matrix of rank ordered pairs is produced, it is used as input for a scaling program. The LOS matrix is well suited to serve as input since it provides the complete ranking of intercandidate differences and similarities and the large number of input variables that MDS requires. Rabinowitz (1975) indicates that 8 to 10 variables are the minimum number of variables that can be analyzed. The creation of 45 pairs of variables in LOS increases the number of comparisons to a more acceptable number.
Although factor analysis could have been chosen, a decision was made to use a nonmetric multidimensional scaling technique to produce the electoral spaces. The nonmetric analysis was chosen because 1) it makes weaker assumptions than factor analysis and 2) factor analysis has a tendency to over-estimate the dimensionality of the type of preference data which is being used here. In addition, MDS is a nonmetric technique and it requires ordinal rather than interval data. Since survey data contain substantial measurement error, it is preferable to sidestep the assumption that the relationships among voters' preferences have a meaningful interval interpretation (Weisberg and Rusk, 1970, p. 1173).

Also, Coombs (1964) and Weisberg and Rusk (1970) have provided evidence that when preference data are analyzed, factor analysis overestimates the number of dimensions. Factor analysis and MDS differ in what they place at the opposite ends of a dimension. Factor analysis places variables together which have a perfect correlation so that those with a correlation of 1.0 are placed at one end and those with a correlation of -1.0 are placed at the opposite end of the dimension. MDS, on the other hand, places all variables that are exactly the same on top of each other and places the variables that are most dissimilar to each other at opposite ends of the dimension. With MDS it will always be possible to locate the most dissimilar variables and put them at the ends of the
dimensions (see variables A and F in Figure 8). With factor analysis, however, when the variables have positive correlations with each other, there are no variables to place at the end of the dimension. As a result, the first dimension will (assuming positive correlations) only indicate what the variables share in common. The variables such as A and F which are not related to each are not included on the first dimension at all; they are a part of the second factor analysis dimension (see Figure 9). The result is that MDS often does not produce
a dimension equivalent to the first factor analysis dimension and the first MDS dimension and the second factor analysis dimension are often similar. Table 8 provides a hypothetical set of relationships among six variables and illustrates the dimensions that factor analysis (principal components) and MDS would produce from these six variables.

Table 8

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<td>.6</td>
<td>.4</td>
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<td>.2</td>
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<td>.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The multidimensional scaling program (MDS) constructs a space in which, as far as possible, the pairs of candidate issue positions which were most similar are placed close together while the pairs which were least similar are placed far apart. The scaling program attempts to ensure that spatial distances between pairs of candidate points are monotone with
the rankings of the pairs. This program produces both a
spatial representation of the candidates' positions and the
underlying dimension(s) on which candidates compete for votes.

The MDS program locates the points using an iterative
trial and error process. The researcher often requests that
4 or 5 solutions with different numbers of dimensions be
produced.\(^1\) In each solution the points are arbitrarily
placed in the space and a badness of fit measure (stress)
is calculated to determine if the distances between points are
monotone with the candidate issue distances. If the solution
is not acceptable, the program moves the points around to
draw similar points closer together and push dissimilar
points farther apart.

Once the different spaces have been produced, the researcher
chooses the space which best represents candidate-voter issue
proximity. In addition to relying on theoretical expectations,
the researcher also uses stress coefficients to help him select
a space. Stress coefficients are a badness of fit measure
which indicate how much the candidates' locations deviate
from a monotonic relationship with the voters' candidate
preferences.\(^2\) Stress coefficients can range in value from
0 (a perfect fit in which the preferences and positions are
completely monotone) to 1.0 (a fit which is so bad that none
of the preferences and positions are monotone). Rabinowitz
(1975, p. 369) suggests a guideline that is helpful in judging
the quality of a solution (see Table 9). He cautions that if

Table 9
Guidelines For Judging MDS Solutions

<table>
<thead>
<tr>
<th>Quality of Solution</th>
<th>Stress Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect</td>
<td>.00 - .05</td>
</tr>
<tr>
<td>Excellent</td>
<td>.05 - .10</td>
</tr>
<tr>
<td>Good</td>
<td>.10 - .20</td>
</tr>
<tr>
<td>Fair</td>
<td>.20 - .40</td>
</tr>
<tr>
<td>Poor</td>
<td>.40 - 1.0</td>
</tr>
</tbody>
</table>

the solution has only one dimension or there are more than 30 respondents, the range of each category should be expanded.

As noted earlier, the stress coefficient can be used to determine which space will best serve as a test of effect. Hopefully, the researcher finds a space which is congruent with his theoretical expectations and has a stress coefficient at the elbow of the pattern of coefficients. To determine which space is at the elbow, the stress coefficients of each solution should be plotted against the number of dimensions (see Figure 10). The elbow exists at the point where the decline of the stress coefficients diminishes. Figure 10 provides a
hypothetical pattern of stress coefficients in 5 different spaces. The 3 dimensional solution is at the elbow, and assuming it made substantive sense, should be selected as the space to test ect.

The selection of a solution without the lowest possible stress value indicates that minimizing the stress is not the only important goal in scaling. As noted earlier, the substantive interpretation of a space is also important. Solutions with three, four or five dimensions have lower stress values because they have more coordinates to better reproduce the structure of the input data matrix, but the latter dimensions may be capturing only idiosyncratic or random
features in the data (Rabinowitz, 1975). The goal is to find substantively important dimensions and this is done in part, by not selecting solutions which exist beyond the elbow.

Interpretation of the chosen space is often made easier when principal component rotation is used on the dimensions. This is an orthogonal rotation in which the first dimension accounts for most of the variance while successive dimensions account for progressively less of the remaining variance.

Although interpretation often proceeds via rotation and substantive explanation of each dimension, the researcher needs to proceed with caution. Rabinowitz (1975) warns that problems can occur because the origin in the MDS solution is arbitrary and distances from the center of the space are relative. The problems occur if a researcher assumes the space has a fixed origin and that distances from the center of the space have an absolute meaning which indicates how centrally or peripherally candidates are located. Researchers can also avoid problems by examining the pattern of the candidate positions in the entire space (Rabinowitz, 1975) and by resisting the temptation to interpret each dimension as a separate unrelated entity.

The Nonmetric Scoring Technique

Finally, the last step in the process of creating electoral spaces is to place the voters in the space. Rabinowitz (1973)
has devised a program called nonmetric scoring (NMSCORE) which places the voter in the candidate space. The input for the NMSCORE is the same issue distance variables which were used as input for the LOS ranking program plus the matrix of scaled candidate positions which is produced in the MDS program. The NMSCORE program seeks to place voters in the space so that voters' preferences for the candidates' issue positions (as represented by the issue distance variables) is monotone with the scaled voter-candidate relative proximity (i.e., the matrix of scaled candidate positions). The program is much like the MDS program in that both are nonmetric and are evaluated with the same stress formula.

Potential Problems with the LOS and MDS Programs

Like any other technique or set of techniques, there are disadvantages associated with the type of analysis chosen in this research. First, citizen perceptions of differences between the candidates' positions and similarities among each candidate's positions have the potential to create complete candidate separation in the LOS rank ordered matrix. When this occurs, MDS is an unsuitable scaling technique because it produces degenerate solutions. Second, some of the parameters in the LOS program such as the DENSE and DISCRIM parameters may not be well suited for 7 category questions. These parameters measure the number of ties found (DISCRIM) and the number of
levels that have been used (DENSE). Rabinowitz's LOS program was actually devised for 100 category questions (i.e., candidate thermometer scores) and he suggests that a minimum of 7 responses are necessary to prevent too many ties. Finally, there is always the possibility that the MDS solution will be a local minimum and a better solution will actually exist at a global minimum (Rabinowitz, 1975). Despite these problems, however, the techniques still appear to be a reasonable choice of statistics with which to create candidate-voter spaces to test etc.

**SUMMARY**

The purpose of this chapter is to select, justify and explain the analysis which will be used to test electoral competition theory. Issue distance variables (the absolute distance between each respondent's and each candidate's positions on an issue) will be used because they help ensure that candidates and voters will be arrayed in a space organized on an underlying structure of issue proximity. Nonmetric ranking (line-of-sight) and scaling technique (multidimensional scaling and nonmetric scoring) were chosen because they are more compatible with the random error in survey data and the preference variables which were chosen. The line-of-sight procedure ranks pairs of variables ranging from those that are
most similar to those least similar. The multidimensional scaling then places the candidates in an electoral space so the most similar pairs are closest together and the least similar pairs are farthest apart. Finally, the nonmetric scoring program places voters close to the candidates they prefer. An examination of the relative positions of candidates and voters is all that is necessary for a test of ect. If voters choose the candidates they are closer to and if candidates choose issue positions which place them near large proportions of the voters, the evidence will support the predictions.
Endnotes

1 Researchers who know how many dimensions they want the space to have can request that a space with the desired number of dimensions be produced. In fact, the more explicit the researchers expectations about the space are, the better it is. Usually, however, the researcher does not know how many dimensions to request and he must examine several different spaces.

2 Rabinowitz (1975, p. 359) provides Kruskal's formula for stress:

\[
\text{Stress} = \frac{\sum_{i=1}^{\text{# of pairs}} (\text{actual distance pair } i) - (\text{target value pair } i)^2}{\left(\sum_{i=1}^{\text{# of pairs}} (\text{actual distance pair } i) - (\text{mean actual distance over all pairs})^2\right)}
\]

where the target value of pair \(i\) refers to the value that pair \(i\) would have if the data were perfectly monotonic with the respondents' preferences.

It should be noted that this is the second stress coefficient that Rabinowitz has devised and is technically referred to as Stress 2.
The analysis in this chapter will serve as a partial test of the predictions of electoral choice theory (Downs, 1957; Davis, Hinich and Ordeshook, 1970; Riker and Ordeshook, 1973). Electoral choice theory (ect) offers a number of advantages. It has carefully defined assumptions. It is a theory from which predictions of political behavior can be deduced. It is concerned with the individual-level process in which voters choose candidates and the more macro-level process by which candidates choose strategies and present alternatives to the voters. This chapter will focus on that part of ect which is concerned with the individual's voting decision. The social choice component of ect will be examined in a later chapter.

However, before proceeding with the analysis, it is necessary to consider some of the problems (both theoretical and methodological) associated with ect. There will be a brief discussion of these problems and a review of earlier
spatial analyses in the next two sections. Then, data will be analyzed to determine if 1) issue evaluation plays the role required by ect and 2) if voters maximize their utility by choosing the closer candidate as ect predicts.

THEORETICAL AND METHODOLOGICAL PROBLEMS ASSOCIATED WITH ELECTORAL COMPETITION THEORY

One basic theoretical problem is that electoral competition theorists have traditionally required that voters evaluate the candidates solely on the basis of issues. Strangely, there is nothing within the theory to suggest why issue evaluation is to be preferred over nonissue criteria. But even if it were theoretically necessary for voters to judge candidates solely on the basis of issues, it may be impossible to isolate the effect of issues on candidate evaluation from the effect of party affiliation or candidate competence on candidate evaluation. Although the data in this chapter will be restricted to the utility citizens expect from candidates' issue positions, the effects of nonissue evaluations may creep into the analysis.

A second problem concerns the assumptions of ect. Critics have complained they are unrealistic. Experimental results reported in an earlier chapter indicated psychologists cannot provide proof or disproof that people have transitive
preferences and use utility maximization to make their choices. In this analysis, no attempt will be made to determine if individual's preferences are transitive, but there will be a test to see if citizens maximize their utility by selecting the candidate who is closer to them on the issues. In an attempt to determine the relative proximity of candidates and citizens on the issues, scaling techniques will be used to place the candidates and voters in an electoral space.

The third problem is the difficulty of selecting the variables and scaling techniques to produce a space which represents voter-candidate proximity on the issues. There are many alternatives and few guidelines to suggest which choices will be most successful. A variety of alternatives has been used in recent spatial analyses of candidates and voters but, it will be argued, existing work does not constitute an adequate test of ect.

REVIEW OF SPATIAL ANALYSES

Researchers have used different variables and scaling techniques to produce spatial representations of recent elections. Rusk and Weisberg (1970, 1976) and Rabinowitz (1978), using a similar research design, produced spaces in which candidates were located on the periphery while Aldrich and Mc Kelvey (1977) used a different design and found candidates
at more central locations. These analyses have been successful in other respects, but none of them is an adequate test of ectl.

Rusk and Weisberg and Rabinowtiz scaled the thermometer scores of ten or more candidates using a Shepard-Kruskal nonmetric multidimensional scaling algorithm. Rusk and Weisberg found similar dimensions in the 1968 and 1970 elections. In their space, candidates are arrayed on a traditional partisan cleavage and a new social conflict cleavage. The disputes which separated the candidates were questions about the government's role in providing social programs (partisan cleavage) and conflict over the legitimacy of protest demonstrations, new roles for women and minorities, and so on (social conflict cleavage). Rabinowtiz, analyzing 1968 and 1972 data, found traditional partisan and ideological cleavages which separated candidates according to their party affiliation and support or opposition to the government's social programs. The dimensions produced in these analyses characterize basic political divisions. It is not surprising that voters organize the candidate's messages by placing candidates on one side or another of these cleavages.

These analyses are not a suitable test of ectl for several reasons. First, in Rusk and Weisberg's analyses, respondents were not displayed in the space and, therefore, the relative position of candidates and voters could not be examined.
Second, too many candidates are included in the analysis. The spaces should be based on evaluations of the nominees or front runners in a campaign. When respondent's preferences for a large number of candidates are measured with thermometers and scaled, the solution is an indication of general underlying dimensions of political conflict such as partisanship and ideology. A peripheral position on one of these dimensions represents placement on one side of a cleavage (i.e., opposition rather than support of governmental activity) more than it represents a radical position on an issue. And third, because the dimensions represent the underlying structure of political conflict, they simply do not indicate the proximity of voters and candidates on specific issues.

Aldrich and McKelvey (1977) created a spatial representation of the 1968 election. Unlike the earlier scaling analyses, they determined the relative positions of citizens and candidates on the basis of issues. And, as Figure 11 indicates, the candidates in their space were in the center. Interpretation of the candidates' and voters' positions in the space makes a great deal of intuitive sense. In general, the centrally located candidates are those who took moderate positions on the issues while the peripherally located candidates took more extreme positions. Respondents are concentrated in the center of the space. Since Nixon is most centrally located, he is located near the most voters, but Humphrey and Johnson are also
Figure 11

Aldrich and McKelvey's Spatial Representation of the 1968 Election

(Source: Aldrich and McKelvey's article "Scaling with Applications to 1968 and 1972 Presidential Elections," p. 127.)

located near a large number of respondents.

The different findings reported by Rabinowitz, on the one hand, and Aldrich and McKelvey on the other, are probably the result of different methodologies that were used. Rather than using a large number of candidates, thermometer scores and multidimensional scaling as Rabinowitz and Weisberg and Rusk
did, Aldrich and McKelvey chose a different approach. They analyzed the issue positions of a few candidates on two issues with a unidimensional scaling program.

They chose a different methodological design because their primary goal was to devise a scaling technique to correct for the instrument error found in responses to 7-point questions. In these questions, respondents place a candidate at one of seven positions on a scale which is bounded by opposite positions on an issue. For example, a citizen may place a candidate at a busing for integration position or a neighborhood schools position or any of the five intermediate positions. The responses to these questions are disproportionately clustered in the middle and in the end categories. Aldrich and McKelvey devised a scaling procedure to provide estimates of the "true" candidate positions which are free from the distortion caused by the survey instrument and situation. Their technique produces a solution that is equivalent to the first factor obtained in a principal component factor analysis. It is unusual in that 1) it scales the responses to each issue separately and 2) it produces a distribution of each candidate's position rather than assigning the candidate to one point on the issue scale. The technique, then does not produce a multidimensional space. It produces two separate unidimensional scales which are graphed as orthogonal axes to create an electoral space which is pictured in Figure 11. The citizens are also asked to place
themselves on the 7-point issue questions and their responses are separately scaled to produce a distribution of respondents' ideal points. To determine the relative proximity of candidates and voters, the candidates' and respondents' positions are standardized using the variance of the respondents' ideal positions on one issue.

Aldrich and McKelvey's analysis comes closer than earlier work to creating the type of space that will serve as a test. Use of issue proximity questions ensures the candidate's positions are based on issue perceptions rather than an amorphous preference for the candidates. Since only a few front runners were included, the space organizes the relative positions of the few nominees (or near nominees) in the election.

There are problems with Aldrich and McKelvey's analysis. The first problem is the number of issues. In the 1972 analysis they should have used more than two issues or shown that two issues were sufficient and they had chosen the two most important issues. One probable reason they limited the number of issues was that their method does not allow them to produce multidimensional spaces. This inability to produce the multidimensional space is the second problem. The third problem is the standardization process which is used to determine the relative proximity of the candidates and voters. Neither the candidates nor the respondents would necessarily be as centrally
located if the origin of the axes were not artificially defined to be the mean voter position on the issues. The fourth problem is the type of variable that was analyzed. Aldrich and McKelvey used issue positions although issue distances (i.e., the distance between a respondent and candidate on a 7-point proximity question) would have been better. When issue positions are scaled, the candidate and respondent positions are produced separately. To determine candidate-voter proximity, each respondent's position is compared to one general or averaged candidate position. The use of an issue distance variable ensures that the issue distance between each respondent and each candidate determines the candidate's position and the candidate-respondent proximity.

Existing spatial analyses have been reviewed and the conclusion is that none of the analyses serve as an adequate test of ect. The studies which used thermometer scores (Weisberg and Rusk, 1970 and 1976; Rabinowitz, 1978) arrayed the candidates on general dimensions of political conflict rather than the underlying issue dimensions which are necessary to test ect. Aldrich and McKelvey (1977) failed to analyze enough issues or to produce a multidimensional space. Questions were also raised about the way candidate-voter proximity was determined in their space. The scaling analysis in this chapter will attempt to avoid the problems which have been discussed and meet the necessary and sufficient criteria (which
were listed in chapter 3) for testing ect. First, however, ect's requirement that electoral choices must be policy choices will be considered.

PROJECTION, PERSUASION AND POLICY VOTING

Electoral competition theorists commonly set two requirements for issue voting. First, all respondents must share a common perception of the candidate's positions on the issues. Second, voters must make their choices solely on the basis of issues. In reality, electoral choices probably are influenced by the voter's nonissue evaluations of the candidates. A voter may project his own position onto a candidate if he thinks highly of the candidate. Likewise, when a voter has a positive evaluation of a candidate on nonissue criteria, he may adopt the candidate's position as his own. In either case, pure issue voting does not occur.

In regards to the first problem, evidence indicates candidates are perceived to have many different positions on the same issue (Bruner, 1978; Wyckoff, 1979). Bruner concluded that, in the eyes of the voters, there are seven Nixons and seven McGoverns on each issue.

To establish that voters choose solely on the basis of the issues, it is necessary to determine that nonissue evaluations do not influence the citizen's issue position or his perception of
the candidate's position. The second problem, then, is to measure projection and persuasion. Wyckoff measures projection by examining the dispersion of candidates' positions since he assumes it is caused by projection. In fact, other factors could also produce the dispersion. For example, if a candidate sent different messages to different groups, the candidates would legitimately be perceived in different positions. And, as Aldrich and McKeelvey found, part of the dispersion could be due to instrument error.

There is, however, a certain logic to Wyckoff's explanation of projection. It is assumed that citizens will project when they find it difficult to ascertain the candidates' positions. This is a reasonable assumption and they find evidence to support it. Wyckoff found less dispersion (and, therefore, less projection) in 1972 when the candidates took distinct issue positions than in 1976 when it was difficult to know what the candidates' positions were.

A second method of demonstrating projection has been to seek to establish causal links between respondent's and candidate's positions. Markus and Converse (1979) used panel data and a dynamic model to estimate projection and persuasion effects. They found evidence of both, but the projection effects were estimated to be 20% stronger than the persuasion effects. They estimated that a voter who favorably evaluates a candidate for nonissue reasons will project away or reduce the actual
differences between his and the candidate's position by up to 25%.

Page and Jones (1979) provide indirect evidence of projection and persuasion. Since their model uses policy distance in lieu of separate candidate position and respondent position, it is not possible to determine whether the respondent's position or perceived candidate position is influenced by nonissue evaluation of the candidates. This more generalized influence of candidate evaluation on policy distance will be referred to as rationalization. Using a nonrecursive model to estimate the reciprocal effects of issue distance and candidate evaluation, they find evidence of both policy voting and rationalization (see Figure 12). A rationalization effect is particularly pronounced in 1972.

\[
\begin{align*}
1972 & \quad \text{policy distance} \quad \frac{.76}{.81} \quad \text{candidate evaluation} \\
1976 & \quad \text{Policy distance} \quad \frac{.44}{.57} \quad \text{candidate evaluation}
\end{align*}
\]

Figure 12

Page and Jones' Estimates of the Reciprocal Effects of Policy Distances and Candidate Evaluation

Although Nixon and McGovern offered very clear issue choices, this did not prevent candidate evaluations from substantially altering the distance respondents perceived between themselves
and the candidates.

Two conclusions should be drawn from the projection analyses. First, there are two different (but not contradictory) rationales which can be used to explain projection. For Markus and Converse and Page and Jones, projection or persuasion occur when nonissue criteria are important. For Bruner and Wyckoff, projection occurs when candidates take similar or fuzzy positions. Of course, it is possible that nonissue criteria will become important if citizens cannot distinguish between the candidate's positions. But it is also possible that nonissue criteria will be important when the candidates take distinct issue positions.

Second, voters' evaluations of their issue distances are not mere rationalizations. Page and Jones emphasize the major role that issue play in the voting decision, suggesting it is "...very much in the spirit of rational man spatial models" (1979, p. 1082). While evidence of projection may require the incorporation of nonissue utility criterion into ect, issues are still an important determinant of the vote. With this conclusion, it is now appropriate to produce spatial representation of elections to determine if ect's predictions describe real political behavior.

In summary, Bruner (1978), Wyckoff (1979), Markus and Converse (1979) and Page and Jones (1979) have provided evidence that issue evaluation and candidate evaluation are very much intertwined. While issues are not the only influence on voting,
they are an important influence on the individual's voting decision. Now that this conclusion has been presented, the selection of issues and the measurement of issue proximity will be discussed.

Selection of Issues

Five issues were examined in each election. In both elections busing, government guaranteed standard of living and marijuana were chosen. The other issues were Vietnam and inflation in 1972 and taxes and health care in 1976. The issues were chosen because they were the five most mentioned problems facing the nation (see Appendix A).

Measurement of Issue Proximity and Candidate Evaluation

On each of the issues, respondents were asked to place themselves and the candidates on a 7-point scale. An issue proximity measure was created by measuring the number of units that separated the candidate and voter on each issue. A candidate who was perceived to have the same position as the respondent would be 0 units away and a candidate who was at the far end of the scale while a voter was at the opposite end of the scale would be 6 units away. The shorter the distance, the greater the utility the voter receives from the candidate's position.
A TEST OF ELECTORAL COMPETITION THEORY'S PREDICTIONS ABOUT VOTERS' ELECTORAL CHOICES

Now the theoretical and methodological problems associated with the theory have been discussed, the theory will be tested. The candidate-respondent issue distances will be analyzed in a multidimensional scaling program. This program, which places similar pairs of candidates close together, will be used to locate candidates and voters in a spatial representation of an election.

The first step in the analysis is calculation of the issue proximity variables. There are 10 issue distance variables: the distance between the respondent and Democratic candidate on five issues and the respondent and Republican candidate on five issues. There are 45 possible pairs of candidates. These pairs can be divided into two groups:

**same-candidate pairs**

10 pairs which compare respondent-Democratic candidate proximity on each issue with respondent Democratic candidate proximity on all other issues (for example, proximity to McGovern's busing position is compared to proximity to McGovern's position on Vietnam, marijuana, etc).

10 pairs which compare respondent-Republican candidate proximity on each issue with respondent-Republican candidate proximity on all other issues.

**different-candidate pairs**

25 pairs which compare respondent-Democratic candidate proximity on each issue with respondent-Republican candidate proximity on all other pairs.
The line-of-sight program (Rabinowitz, 1973) ranks the pairs of candidates from the most similar (#1) to least similar (#45). It produces a matrix which is the nonmetric counterpart of the correlation matrix which is analyzed in a factor analysis program. The line-of-sight matrix is analyzed in the MDS program to determine the candidate's positions in the space. The results of the analysis of each election are reported below.

1972 Election

The same-candidate pairs are more similar to each other than they are to the different-candidate pairs (see Table 10). There are only two same-candidate pairs which are farther apart than the different-candidate pairs. This suggests that when respondents evaluate the candidates' issue positions, the most basic distinction they make is between candidates rather than between groups of issues. Consequently, the organization of the electoral space is likely to be more influenced by candidate divisions than issue divisions.

As predicted, the most important organization in the 1972 space is the location of Nixon's positions in one segment of the space with McGovern's positions in an opposite segment (see Table 11). The two dimension space is categorized as good since the stress value is .177 (Rabinowitz, 1975, p. 369). Although principal axis rotation was used on the two dimensional solution to make the interpretation easier, the interpretations
### Table 10

**Rank Order Matrix of Respondent-Candidate Issue Distance in 1972**

<table>
<thead>
<tr>
<th></th>
<th>Nixon</th>
<th></th>
<th>McGovern</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gov</td>
<td>Marj</td>
<td>Bus</td>
<td>Infl</td>
</tr>
<tr>
<td><strong>Nixon</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov</td>
<td>G'nt</td>
<td>Std</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marj</td>
<td>9a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>11</td>
<td>22b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infl</td>
<td>2</td>
<td>6</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Viet</td>
<td>3</td>
<td>5</td>
<td>16</td>
<td>1</td>
</tr>
</tbody>
</table>

| **McGovern** |       |       |     |      |      |       |        |     |      |      |
| Gov        | G'nt  | Std   | 43 | 37  | 40   | 39    | 44     |     |      |      |
| Marj       | 32    | 30    | 28 | 26  | 27   | 12    |        |     |      |      |
| Bus        | 42    | 30    | 30 | 38  | 41   | 13    | 10     |     |      |      |
| Infl       | 24    | 15c   | 25 | 7c  | 23   | 18    | 8      | 21b |      |      |
| Viet       | 33    | 36    | 34.5 | 34.5 | 45   | 17    | 19     | 20  | 4    |

- **a** Cell entries are the rank orders; 1 indicates the pair of issue distances that is closest together while 45 indicates the pair of issue distances that is farthest apart.
- **b** Indicates a same-candidate pair of issues that is less similar than at least one different-candidate pair.
- **c** Indicates a different-candidate pair of issues that is more similar than at least one same-candidate pair.

Dense = .95
Rho (differences and sums) = .381
Table 11
Multidimensional Scaling Coefficients of the Issue Distance Variables in 1972

<table>
<thead>
<tr>
<th>Issue</th>
<th>Unrotated Solution</th>
<th>Rotated Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dimen-</td>
<td>dimen-</td>
</tr>
<tr>
<td></td>
<td>sion 1</td>
<td>sion 2</td>
</tr>
<tr>
<td><strong>Nixon</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>-1.024</td>
<td>.155</td>
</tr>
<tr>
<td>Marijuana</td>
<td>-.746</td>
<td>-.491</td>
</tr>
<tr>
<td>Busing</td>
<td>-.727</td>
<td>.693</td>
</tr>
<tr>
<td>Inflation</td>
<td>-.794</td>
<td>.090</td>
</tr>
<tr>
<td>Vietnam</td>
<td>-1.046</td>
<td>-.024</td>
</tr>
<tr>
<td><strong>McGovern</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>1.301</td>
<td>-.123</td>
</tr>
<tr>
<td>Marijuana</td>
<td>.743</td>
<td>-.271</td>
</tr>
<tr>
<td>Busing</td>
<td>1.081</td>
<td>-.658</td>
</tr>
<tr>
<td>Inflation</td>
<td>.162</td>
<td>.060</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1.050</td>
<td>.568</td>
</tr>
<tr>
<td>SSQ</td>
<td>8.400</td>
<td>1.602</td>
</tr>
<tr>
<td>Stress</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nixon's Centroid                     | -.87   | -.02  |
McGovern's Centroid                  | .85    | .02   |
of the rotated and unrotated solutions are virtually the same.

The most important distinction in this space is the difference which exists between the candidates on almost all the issues. This candidate distinction is reflected in dimension 1; which accounts for the greatest part of the variance (sum of squares or SSQ = 8.49 for this first dimension while the total SSQ for both dimensions is 10.00) is a candidate dimension on which Nixon issue variables have a negative coefficient sign and McGovern issue variables have a positive coefficient sign. With the exception of McGovern's inflation position, all the variables have a high loading on this dimension.

To reemphasize, a cleavage exists between the candidates on all issues in 1972. The cleavage, however, is more pronounced on some issues than others. In extending the interpretation, however, care must be taken not to forget the space represents a polarization of the candidates on the issues.

With this caveat, the interpretation can proceed. The variables with the highest coefficients suggest an unusual polarization of candidates which does not follow traditional partisan cleavages. Both candidates' Vietnam and government guaranteed standard of living and McGovern's busing variable are particularly important issues on this dimension. There is no evidence of a traditional New Deal cleavage defined by inflation and government guaranteed standard of living. Nor is there evidence of conflict on a new social issues dimension defined
by the Vietnam and marijuana issues. Rather, the candidates are most polarized on issues representing one element of traditional partisan conflict (guaranteed standard of living) and one element of foreign policy conflict that became a subject of massive domestic protest (Vietnam).

Then there is McGovern's busing position. Unfortunately, there are several possible interpretations of its high coefficient on the dimension. It could indicate that candidate's disagreement on busing is one element of a normal partisan dispute. After all, recent presidential candidates disagreed about the role government should play in integration. Another interpretation suggests that McGovern's busing position is associated with the other extreme positions he took on Vietnam and guaranteed income. One bit of evidence which supports this nontraditional cleavage interpretation is that Nixon's busing coefficient does not have a correspondingly high coefficient. Furthermore, the interpretation of the second dimension provides additional evidence that the differences between the candidate's positions may be unique to the 1972 election.

The second dimension is much less important in determining the organization of the space (SSQ = 1.51). It represents a conflict over the appropriateness of government action in solving societal problems. At one end of the dimension are issues on which the candidates advocated government action.
These include Nixon's marijuana position (the government should retain laws making marijuana illegal) and McGovern's busing position (the government should promote social integration). Nixon's busing position and McGovern's Vietnam positions are at the opposite end of the dimension. They are areas in which candidates wanted decreased government activity.

Although the conflict over governmental action is a common theme in American politics, the controversy in 1972 does not appear to be either partisan or ideological in character. It is not a partisan cleavage since Nixon and McGovern's positions are found together at each extreme of the controversy. Nixon and McGovern both advocate government activity, they simply disagreed about the areas in which the activity is appropriate. It is not an ideological cleavage either. The anti-marijuana position usually associated with conservatives is located on one end of the dimension along with the probusing issue position which is usually associated with liberals. Conversely, at the opposite end of the dimension are both the anti-busing (conservative) and anti-war (liberal) positions. This dimension suggests that neither traditional ideological nor partisan distinction is a useful way to conceptualize the underlying organization of political issues in 1972. Page and Jones (1979) have also suggested that the cleavages which separated candidates in 1972 were not traditional partisan divisions.
Figure 13 provides a graphic representation of electoral conflict. The dominant influence that organizes the space is candidate differences. Since Nixon's and McGovern's clusters are compact and clearly distinguished from each other, it is possible to compute a centroid position for each candidate which serves as a mean Nixon and mean McGovern position.

Once the candidate positions are established, Rabinowitz's nonmetric scoring program was used to locate respondents in the space. The program places the individual in the space according to how similar his position on the five issues are relative to the perceived positions of each candidate. Each respondent's similarity to the candidates on 5 issues is indicated by one point in the space. Of the 1372 respondents used in this analysis, 1105 were located in the space (80.5%). The stress parameter for the 1105 who were scaled is .29.

Figure 14 indicates the spatial proximity of respondents and candidates. There are two concentrations of respondents. One is located on Nixon's side of the space and the other is located on McGovern's side. Nixon's centroid and his position on government guaranteed standard of living, inflation and Vietnam are close to or within the concentration of respondents. His positions on busing and marijuana, on the other hand, are less centrally located than many of the respondents.

McGovern's centroid and most of his issue positions are even farther away from respondents than Nixon's positions.
Figure 13

1972 Candidate Space
Figure 14

1972 Candidate and Respondent Space
Only one of McGovern's positions (on inflation) is within the concentration of respondents on his side of the space. McGovern's position on Vietnam is particularly far from the concentration of McGovern respondents.

In summary, two generalizations can be made about the location of respondents in the space. First, most respondents are centrally located in the space. Second, there are two particular areas of respondent concentration in the center. The first area is on Nixon's side of the space and includes his centroid position. The second area is on McGovern's side of the space but it is more centrally located than most of McGovern's issue positions. As expected, Nixon's positions are closer to the center of the space and to respondents than McGovern's positions.

In order to determine how well the space describes reality, the total distance of each respondent from Nixon's 5 positions will be calculated. This issue distance will be compared to the total distance of each respondent from McGovern's 5 positions. Figure 15 indicates how the distances are calculated. For example, the total Nixon distance for the respondent would be the Euclidean sum of the 5 lines running from the respondent's ideal position to each of Nixon's positions. Respondents should vote for the candidate whose total issue distance is smallest—the candidate who is closest to the respondent's ideal location in the space when all the
issues are considered. When respondents do vote for the candidate who is closest, a correct prediction is made. Table 12 indicates the percentage of correct and incorrect predictions.

Table 12
Predictions of the Vote by Candidate Proximity

<table>
<thead>
<tr>
<th>Respondent Voting Decision</th>
<th>Candidate Closest to Respondent</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nixon</td>
<td>McGovern</td>
<td>Total</td>
</tr>
<tr>
<td>Nixon</td>
<td>53.1%a</td>
<td>11.4%</td>
<td>64.5%</td>
</tr>
<tr>
<td></td>
<td>(359)</td>
<td>(77)</td>
<td>(436)</td>
</tr>
<tr>
<td>McGovern</td>
<td>5.2</td>
<td>30.3</td>
<td>35.5</td>
</tr>
<tr>
<td></td>
<td>(35)</td>
<td>(205)</td>
<td>(240)</td>
</tr>
<tr>
<td>Total</td>
<td>58.3</td>
<td>41.7</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>(394)</td>
<td>(282)</td>
<td>(676)</td>
</tr>
</tbody>
</table>

Total correct prediction 83.4%
a cell entry is the percentage of the total respondents
Total incorrect prediction 16.6%
Lambda = .533
Eighty-three percent (83%) of the respondents voted as expected theory predicted. They chose the candidate who was closest to them in the space. Of those who voted for the candidate who was farther away, more than two-thirds voted for Nixon. This may reflect the respondent's desire to say they voted for the winner or the impact of the bandwagon effect on people who were closer to McGovern's positions.

In Table 12 the prediction rate is 83.4% and the measure of association between candidate proximity and voting is .533. Both of these are respectable indications that candidate proximity is an important predictor of the vote. The prediction rate in this analysis is equal to or higher than the prediction rates found in other scaling analyses. Aldrich and McKeelvey (1977) only predicted 68% of the vote for the Humphrey-Nixon pair. Rabinowitz (1978) accurately predicted 84.2% of the vote in 1968 and 84.5% of the vote in 1972.

Although analyses which did not use scaling report higher prediction rates, it can be argued that these studies were successful because they use alternative measures of intended vote to predict vote. Campbell, et al. (1960) had a slightly higher prediction rate of 85% when they used the six dimensions of partisan attitude but they were able to correctly predict 75% of the vote by using respondents' attitudes toward Eisenhower. This suggests their ability to predict vote comes primarily from the use of a candidate evaluation variable. It may be that the
open-ended evaluations of candidates which are used in The American Voter and Kelley and Mire's research (1974) are little more than alternative measures of voting intention which did not explain why the respondents like or dislike the candidate. Other research which has reported even higher levels of prediction accuracy (95% for Brody and Page, 1973; and 97% for Markus and Converse, 1979) predict vote on the basis of candidate thermometer scores. Again, thermometer scores may serve to measure intended vote.

In summary, the 1972 scaling results have produced a spatial arrangement of candidates and respondents in which the primary organization is candidate conflict. While there was an issue dimension, it was much less important than the candidate dimension. This raises questions about the emphasis that ekt places on policy voting.

1976 Election

The same rank ordering and scaling procedures were performed on the respondent's 1976 responses to seven-point issue questions. Table 13 shows the matrix of rank ordered pairs. Compared to 1972, the similarity of same-candidate pairs is not as pronounced in this data. Five of the 25 different-candidate pairs are more similar than the same-candidate pairs. This suggests that the candidate dimension produced in the scaling will be important but it will not overshadow the issue dimension to the same degree.
Table 13
Rank Order Matrix of Respondent-Candidate Issue Distances in 1976

<table>
<thead>
<tr>
<th></th>
<th>Ford</th>
<th>Carter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gov  Marj Bus Tax Hlth</td>
<td>Gov  Marj Bus Tax Hlth</td>
</tr>
<tr>
<td>Ford</td>
<td>Gov  Marj Bus Tax Hlth</td>
<td>Gov  Marj Bus Tax Hlth</td>
</tr>
<tr>
<td>Gov G'nt</td>
<td>6a</td>
<td>37</td>
</tr>
<tr>
<td>Std</td>
<td>29b</td>
<td>18c</td>
</tr>
<tr>
<td>Marj</td>
<td>21b</td>
<td>45</td>
</tr>
<tr>
<td>Bus</td>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td>Tax</td>
<td>5</td>
<td>43</td>
</tr>
<tr>
<td>Hlth</td>
<td>22.5b</td>
<td>2</td>
</tr>
<tr>
<td>benign</td>
<td>14</td>
<td>1</td>
</tr>
</tbody>
</table>

\[\text{cell entries are the rank orders; 1 indicates the pair of issue distances that are closest together while 45 indicates the pair of issue distances that is farthest apart.}\]

\[\text{a indicates a same-candidate pair of issues that is less similar than at least one different-candidate pair.}\]

\[\text{b indicates a different-candidate pair of issues that is more similar than at least one same-candidate pair.}\]

\[\text{Dense} = .968\]
\[\text{Rho (differences and sums)} = .422\]
it did in 1972.

The rank ordered pairs were scaled in MDS (see Table 14 and Figure 16). The two dimensional solution had a stress value of .221, which indicates a good solution. Principal component rotation was used to make interpretation of the dimensions easier. As in the last analysis, candidate competition is the primary organization in the space (dimension 1 accounts for most of the variance, SSQ = 7.03). Ford and Carter have opposite positions on government guaranteed standard of living, busing and health, issues which have divided partisans for several decades. The cleavage which separates the candidates in 1976 appears to have a more traditional partisan and ideological nature than the candidate cleavage found in 1972.

The candidates' positions in the space also indicate the candidates' positions are organized so that both candidates' positions on one type of issue are arrayed against both candidates' positions on other issues. On dimension 2 Carter's and Ford's busing positions are located at one end of the dimension while Ford's government guaranteed standard of living and Carter's tax position are at the other end of the dimension. In the 1976 space the racial issues are quite clearly separated from other issues. The arrangement of candidate positions according to the type of issue (rather than the polarization of the candidates on the same issue) is more pronounced in 1976 than 1972 (the SSQ of the issue dimension is 2.97 in 1976 and
Table 14
Multidimensional Scaling Coefficients of the Issue Distance Variables in 1976

<table>
<thead>
<tr>
<th>Issue</th>
<th>Unrotated Solution</th>
<th>Rotated Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dimension 1</td>
<td>dimension 2</td>
</tr>
<tr>
<td><strong>Ford</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>-.509</td>
<td>.939</td>
</tr>
<tr>
<td>Marijuana</td>
<td>-.102</td>
<td>.303</td>
</tr>
<tr>
<td>Busing</td>
<td>-1.354</td>
<td>-.447</td>
</tr>
<tr>
<td>Taxes</td>
<td>-.471</td>
<td>.033</td>
</tr>
<tr>
<td>Health Care</td>
<td>-1.001</td>
<td>.808</td>
</tr>
<tr>
<td><strong>Carter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>.977</td>
<td>-.246</td>
</tr>
<tr>
<td>Marijuana</td>
<td>.255</td>
<td>-.044</td>
</tr>
<tr>
<td>Busing</td>
<td>.369</td>
<td>-1.169</td>
</tr>
<tr>
<td>Taxes</td>
<td>.843</td>
<td>.436</td>
</tr>
<tr>
<td>Health Care</td>
<td>.993</td>
<td>-.613</td>
</tr>
<tr>
<td>SSQ</td>
<td>6.179</td>
<td>3.822</td>
</tr>
</tbody>
</table>

Stress = .221

Ford's Centroid | -.761 | -.024 |
Carter's Centroid | .761 | .024 |
Figure 16

1976 Candidate Space
1.51 in 1972).

It might seem strange that in 1976, when issues were supposed to be less important, the issue dimension accounts for more variance than in 1972. There is, however, an explanation for this seeming anomaly. In both 1972 and 1976 there is a candidate dimension and an issue dimension. In 1972 the candidates took distinct contradictory positions so each candidate's positions are clustered close to each other and far away from the opposing candidate's positions. This means that Nixon's and McGovern's positions are polarized, the candidate's positions are located opposite each other in the space, and the candidate dimension accounts for a great deal of variance in the space (SSQ = 8.5). In 1976, by contrast, each candidate's set of issue positions was less closely clustered together, less distinct and less polarized, suggesting that the candidate dimension should be and is less important (SSQ = 7.0). In 1976, then the issue dimension is more important in defining the space even though issues were less important in shaping the outcome of the electoral race.

Once the candidate positions have been determined, the respondents were located in the space (stress = .195). Figure 17 shows the relative proximity of candidates and respondents in 1976. There was a large concentration of respondents in the center of the space and five smaller concentrations of respondents which surround the one large
Figure 17

1976 Candidate and Respondent Space
central concentration (these concentrations are outlined in Figure 17). Because of the large number of respondents in the analysis, the center concentration is large and encompasses a large number of the candidates' positions. Both candidates' centroids are located at the edge of the large central concentration. Although Ford and Carter's individual issue positions are equally dispersed from the center of the space, the respondent's positions are not. Most respondents have central locations in the space but more of them are concentrated in Carter's segment than Ford's segment of the space.

As in 1972, the ability of the spatial solution to predict vote was examined. Table 15 indicates that the prediction rate is only 72.2%, or 11.2% lower than in 1972. One plausible explanation for the decrease is that issue differences between the candidates were not as distinct in the 1976 election and, therefore, issue proximity variables would not predict as well in 1976 as they did in 1972.

Unfortunately, the explanation is probably not this simple. While issues were important and candidates took distinctive and different positions on them in 1972, there is also reason to believe that respondents had distinct and differing perceptions of the candidate's personal and leadership qualities in 1972. If more projection did occur in 1972, the issue distance variables would reflect more disparate evaluations of the candidate's issue positions and their personal qualities. These
Table 15

Predictions of the 1976 Vote by Candidate Proximity

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Candidate Closest to Respondent</th>
<th>Ford</th>
<th>Carter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voting Decision</td>
<td>Ford</td>
<td>39.1% 9.9% 49.0%</td>
<td>(1052) (266) (1318)</td>
<td></td>
</tr>
<tr>
<td>Voting Decision</td>
<td>Carter</td>
<td>17.7 33.2 50.9</td>
<td>(477) (894) (1317)</td>
<td></td>
</tr>
<tr>
<td>Voting Decision</td>
<td>Total</td>
<td>56.8 43.1 99.9</td>
<td>(1529) (1160) (2689)</td>
<td></td>
</tr>
</tbody>
</table>

Total correct prediction 72.3%
Total incorrect prediction 27.6%

Lambda = .436

"contaminated" issue proximity responses may produce a more accurate prediction of the voting decision than issue proximity variables which reflect few projection effects.

It is still somewhat counter-intuitive to find that distinct candidate positions are accompanied by substantial projection rationalization effects in 1972 and fuzzy candidate positions are accompanied by smaller rationalization effects in 1976. To try to clarify this anomaly, it is helpful to consider the possible combinations of minimal and pronounced issue cleavages and small and large rationalization effects (see Figure 18). But first, a little explanation of minimal versus pronounced issue cleavages is appropriate. When the issue cleavage is
<table>
<thead>
<tr>
<th>Issues Cleavage</th>
<th>Nonissue Candidate Evaluation Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronounced</td>
<td>Issue and Candidate Voting</td>
</tr>
<tr>
<td></td>
<td>-candidates offer distinct alternatives</td>
</tr>
<tr>
<td></td>
<td>-candidates' leadership and competence are evaluated</td>
</tr>
<tr>
<td></td>
<td>-candidate-voter proximity on issues is increased or decreased according to how the candidate is evaluated</td>
</tr>
<tr>
<td></td>
<td>Example 1972</td>
</tr>
<tr>
<td>Minimal</td>
<td>Uninformed Rationalization</td>
</tr>
<tr>
<td></td>
<td>-distinction between candidates is minimal or blurred</td>
</tr>
<tr>
<td></td>
<td>-to try to make an issue-based decision, voters either project or adopt their candidate's position</td>
</tr>
<tr>
<td></td>
<td>Example 1976?</td>
</tr>
<tr>
<td></td>
<td>Single Issue Voting or Party Voting</td>
</tr>
<tr>
<td></td>
<td>-there is little projection or persuasion because voters are relatively unconcerned about candidates' positions</td>
</tr>
<tr>
<td></td>
<td>-they decide on the basis of affective ties to the party or a single salient issue</td>
</tr>
<tr>
<td></td>
<td>Example 1976?</td>
</tr>
</tbody>
</table>

Figure 18

Typology of Electoral Processes Categorized by the Importance of Issue Cleavages and Nonissue Candidate Evaluation
pronounced, candidates will have specific and distinctively
different positions on the issues. On the other hand, even when
the issue cleavage is minimal, candidates may still be aligned
on a general partisan cleavage but the distinctions on which
the cleavages was originally based may have blurred so that
voters are provided with few issue alternatives. A typology of
the possible rationalization and cleavages combinations produces
four types of electoral decision-making processes.

In an election marked by issue and candidate voting,
candidates are divided along distinct issue cleavages. The
voters evaluate the candidate's issue positions and their leader-
ship and competence. Voters may project away issue differences
when they have confidence in a candidate and increase issue
differences when they do not have confidence.

A second type of election is characterized by issue voting.
In this type of election, the candidates offer distinct issue
alternatives. Voters make their decision on the basis of issues
with minimal projection or persuasion effects. Relatively pure
issue voting probably occurs only at critical elections when
there are sharp distinctions between parties and candidates
on important issues.

In the third type of election, voters engage in uninformed
rationalization to make the decision. Voters are unable to
distinguish the candidate's positions on the issues, but they
are committed to voting on the basis of issues. To cope with
the situation they are forced to project their own position onto a candidate or they are persuaded by a candidate's position; thus, they rationalize they are voting on the basis of issues even though they cannot clearly distinguish the candidates' positions.

It should be noted that empirical analysis of uninformed rationalization may produce results which seem to indicate issue voting is occurring since issue proximity and voting will be associated with each other. In fact, this type of voting is characterized by persuasion and projection rather than issue voting, so the relationship between issues and vote is partially spurious. Since projection and persuasion are important, this type of electoral decision making is called uninformed rationalization to emphasize voters have little evidence on which to base their issue evaluations of the candidates.

The fourth electoral decision making process is characterized by generally indistinct policy positions and a lack of projection or persuasion. Voters may make their electoral choices on the basis of an effective attachment to a party, a single salient issue or some other factor which is not associated with an evaluation of a number of issues. Since voters are relatively unconcerned about issue positions on a wide range of issues, they have little reason to engage in projection and persuasion. Either single issue voting or party voting is congruent with
this type of process.

The 1972 election appears to be an election in which both issues and candidate evaluation were important. If the addition of candidate evaluation variables in the next chapter improves the prediction rate, this will be evidence that there was issue and candidate voting in 1972. It is not clear whether the 1976 election is an example of uninformed rationalization or party voting. If the candidate evaluation variables which will be incorporated into the scaling in the next chapter increase the prediction accuracy of the 1976 data, the voting decision will have been influenced by nonissue candidate evaluations. In that case, 1976 will be classified as an election in which uninformed rationalization is occurring. If, on the other hand, there is little evidence that nonissue candidate evaluations were important, it will be assumed that party voting is a better description of the decision-making process.

Although the 1976 election initially seems to be an example of this last type of election, this is not necessarily the case. Earlier it was noted that the candidate's positions in 1976 were less polarized and more typical of traditional partisan positions (i.e., the issue cleavage was minimal). The question is whether nonissue candidate evaluations were influential determinants of the vote. Some evidence has been reported which indicates that issue proximity responses do not involve large projection effects in 1976. But it is still
possible that nonissue candidate evaluation was influential even though the effects cannot be detected in 7-point proximity questions.

An alternative explanation can be provided for the differing levels of rationalization that exist between 1972 and 1976. It may be that what has been labeled as greater rationalization effects in 1976 is actually an increase in conflicting attitudes toward the candidates. But even if this were the case, it would be reasonable to ask why there are more conflicting attitudes. There are at least two explanations. First, if candidates' issue positions were so fuzzy that voters either had to project their own positions onto candidates or they had to adopt whatever position they perceived the candidate to have, the voters' opinions would be conflicting. This explanation is compatible with uninformed rationalization. Second, if citizens engaged in single issue or party voting, they are largely unconcerned with the candidates' positions on a broad range of issues. Since citizens in the category would not pay much attention to a candidate's positions, they might give almost random responses (or at least conflicting responses) when pressed to answer survey questions. This explanation is consistent with single issue or party voting.

In summary it is too simplistic to assume that if issue voting is not occurring rationalization probably is (and vice versa). Pure issue voting and rationalization are only two
of several processes that can occur in elections. It would be desirable to have a theory which incorporated the effects of candidate evaluation in a positive manner rather than assuming that all candidate effects constitute a violation of the assumption of issue voting.

THE ISSUE PROXIMITY OF CANDIDATES AND POLITICAL ACTIVISTS

The last section focused attention on issue cleavages and issue voting. Sundquist (1973) has examined party competition and issue cleavages. He suggests that crises in the political and social world cause parties to align along disparate dimensions (or be replaced). In this type of theory, parties divide along issue cleavages to provide voters with alternatives on critical issues.

Most ecp theorists take a very different approach to cleavage models. In their cleavage models, parties or candidates taking different positions are failing to respond to the issue concerns of the mass electorate. Rather ecp theorists attribute the cleavage to the more extremist issue positions of contributors or the candidates themselves. The theorists assume that if candidates were left to compete for votes by appealing to the electorate's distribution of issue positions, candidates would take more centrist positions on the issues. But because activists tend to have extreme issue preferences and candidates
must compete for their financial contributions, campaign
assistance and nomination votes, candidates are forced to take
more extreme issue positions.

A comparison of activist-candidate issue proximity and mass
electorate-candidate proximity would be very useful. It could
be determined if activists do have more extreme positions and are
successful in forcing candidates to take less central positions
on the issues. Although such an analysis was attempted, it
was not possible to provide spatial representations of either
of two activist samples. The first sample was comprised of
400 county chairmen for the Nixon and McGovern campaigns. The
second sample was delegates to the 1972 Democratic and Republican
national conventions. In both cases, the activists had such
polarized evaluations of the candidate's issue positions there
was complete candidate separation (i.e., all same-candidate
pairs were more similar than any different-candidate pair).
Multidimensional scaling programs are sensitive to this type
of polarization among the variables and they produce a
solution with all of McGovern's positions in one location and
all of Nixon's positions at a second location. Such a solution
cannot be used to test etc.
SUMMARY AND CONCLUSIONS

Electoral competition theories predict that voters choose the candidate who best serves their interests. The theory requires that citizens' electoral preferences meet very specific requirements if its predictions are to hold. It requires quadratic utility functions and symmetric and unimodal preference distributions. Critics object that such preferences do not exist in the real world. This research offers partial disconfirmation of these assumptions, but it also recognizes that measurement problems make it difficult to provide confirmation. Measures of the individual's utility function are simply not available in survey data; and, it is likely that a substantial amount of measurement error exists in issue preference data which is available. With the existing gaps and measurement problems associated with preference data, it would be rash to discredit the because survey data are not congruent with its assumptions.

It is usually assumed that voters evaluate candidate's issue positions, selecting the candidate whose positions are most similar to their own. This assumption requires issue voting. Critics object that because projection and persuasion occur it is unrealistic to assume citizens engage in issue voting. This objection seems to be based on the assumption that issue voting and rationalization are mutually exclusive
phenomena. Yet Brody and Page (1973) have acknowledged they can occur simultaneously and recent analyses (Markus and Converse, 1979; Page and Jones, 1979) provide some confirmation that they do. The problem is to explain why rationalization occurs, the conditions under which it is likely to occur and when it will make issue voting impossible. Existing literature offers answers for only the first question. Projection may occur when voters are unable to distinguish the positions of the candidates (Wyckoff, 1979). Either projection or persuasion may occur when a citizen's evaluation of a candidate's position is influenced by nonissue evaluations of the candidate (Markus and Converse, 1979; Page and Jones, 1979).

Although it is likely that rationalization effects are too substantial to be ignored, spatial analyses of the issue proximity questions were produced. The candidate dimension dominated in both spaces, but there was also an issue interpretation of each space. In 1972 the issue dimension distinguished between issues on which the candidates favored more and less governmental activity. A racial-nonracial distinction was made by the issue dimension in 1976. There were even issue interpretations of the candidate dimensions. The candidates appeared to be divided on a more traditional partisan cleavage in 1976 than in 1972. Although the major distinction in each space is between the candidates, the issues were also important. This conclusion points to the importance of
incorporating such nonissue criteria as candidate competence into ect. It also suggests that the relations between issue voting and rationalization should be explored more.

One plausible conclusion about issue voting and rationalization is that their relationship is not as simple as it might have seemed. A typology based on this relationship has been suggested which defines different electoral choice processes. The pure issue voting process is congruent with ect but it is unlikely to occur very often. Informed rationalization will occur when candidates take distinct issue positions. It would be congruent with ect if nonissue evaluation criteria were incorporated in the theory. In uninformed rationalization, the voter is forced to evaluate the utility he receives from candidates largely (or totally) on the candidate's competence, leadership ability and so on. It could still be congruent with a modified version of ect. Finally, there is the fourth category of electoral decision processes which includes both party voting and single salient issue voting. Neither could be easily justified with ect. Although it could be argued that some voters feel their best interests are served by voting for the candidate for whom they have the greatest affective attachment, emotional and affective ties are traditionally excluded from utility analysis. To include them would make the theory so general and all encompassing as to make it useless. The problem with single salient issue voting is
that the single issue varies with the different groups of people. Each group of voters would perceive only the few messages of interest to them and there would be no commonly perceived set of issues which could be analysed to serve as a test of ect.

The results suggest that ect provide a promising theoretical framework for analysis but the nonissue evaluation should be incorporated. While critics are probably overzealous to suggest that ect must be abandoned because of projection and persuasion effects, it is unwise to ignore such phenomena. The incorporation of such a nonissue criterion as candidate competence fits nicely into the rationale of ect and should allow ect to better explain and predict actual electoral decision processes. In the next chapter, candidate competence measures will be introduced into the spatial analysis to determine if the prediction of the spatial analyses does improve.
Endnotes

Electoral competition theories are based on the assumption that the voter evaluates the candidates and chooses the candidate who best serves the voter's interests. Many theorists maintain that the candidates try to win by choosing the issue positions that will please the greatest number of voters. The result is that the midpoint of the public's opinion is adopted by both candidates who end up with similar central positions on the issues. Theorists who subscribe to this framework include (at least under certain conditions): Downs, 1957; Davis, Hinich and Ordeshook, 1970; Riker and Ordeshook, 1973. Other theorists predict differences between candidates. Page (1978) notes there are two kinds of theories which predict party differences. One unusual method (Downs, 1957) rests on the assumption that parties have limited mobility to change their ideological positions; specifically, one party cannot move ideologically past the other. But most cleavage theories assume that factors such as the opinions of activists, financial contributors or the candidates themselves produce issue cleavages between the candidates (Davis and Hinich, 1966; Aranson and Ordeshook, 1972).

Ordeshook (1976), Benn and Mortimore (1976, Introduction) and Page (1977) discuss the assumptions of etc.
One difference in design between Rusk and Weisberg's analysis and Rabinowitz's analysis was the matrix of interrelationships which was entered into the scaling program. Rusk and Weisberg used a matrix of correlations and Rabinowitz used a rank ordered matrix.

One simple test is to examine the amount of scatter in perceptions of candidate position. Bruner (1978) and Wyckoff (1979) found evidence of projection using this test. Bruner has devised a somewhat more complicated test for projection based on the same idea. In this test a candidate's "true" position on an issue is assumed to be the respondents' mean perception of candidate position. Two issue distance measures are then calculated. The first, a proximity index, measures the distance from the respondent's ideal position to the perceived candidate's position. The second, a mean proximity index, measures the distance between the respondent's ideal position and the candidate's "true" position. The correlation of each measure with presidential vote is squared to indicate how much of the variance in vote is associated with each measure. A ratio of the squared correlation (of each index and vote) indicates whether the "true" explained variance is low or high compared to the scattered explained variance. When the ratio is low, it indicates that the scattered perceptions are more important than the true perceptions in accounting for variance in vote. In such situations, projection is thought to
occur.

5 They used two-stage least squares estimates of ten projection equations. While projection does not account for a great deal of explained variance (i.e., the $R^2$'s in the 10 equations range from .00 to .08), nine of the ten coefficients are significant at the .005 level. The authors speculate the coefficients are probably small because of instrument error and error associated with the latent attitudes (Markus and Converse, 1979).

6 If it has not been for these two pairs, the same-candidate pairs would have been totally separated from the different candidate pairs. When this occurs and the matrix is scaled in a multidimensional scaling program (MDS), all of one candidate's issue positions are clustered tightly together at one end of a dimension and the other candidate's issue positions are tightly clustered at the end of a second dimension. Candidate positions in such a solution would be more of an artifact of the scaling program than a good indication of how central or peripheral the candidate's positions are.

7 The one dimensional solution was not used because the stress value (.281) was higher than desirable. Although the stress levels for the two and three dimensional solutions were low (.177 and .111, respectively) the two dimensional solution was interpreted and used throughout the rest of the analyses.
The three dimensional solution was rejected because 1) the dimensions were difficult to interpret, 2) three dimensional solutions are more difficult for the researcher to visualize and present and 3) it is difficult to imagine that voters make decisions by evaluating three different sets of criteria.

Although the rho in the two dimensional solution (.38) is slightly less than the minimum level (.40), it was judged acceptable. The dense value was also rather low (.9500). The program was originally designed for thermometer data which would be less likely to produce ties among different issue pairs. Since this analysis is based on seven-point questions, ties are more of a problem and this may be reflected in the values of the rho and dense.

The MDS program uses the stress 2 formula to calculate the stress values. Rabinowitz's (1975) classification of solutions is as follows:

<table>
<thead>
<tr>
<th>Stress 2 Value</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>.00 - .05</td>
<td>perfect</td>
</tr>
<tr>
<td>.05 - .10</td>
<td>excellent</td>
</tr>
<tr>
<td>.10 - .20</td>
<td>good</td>
</tr>
<tr>
<td>.20 - .40</td>
<td>fair</td>
</tr>
<tr>
<td>.40 - 1.00</td>
<td>poor</td>
</tr>
</tbody>
</table>

Nixon's centroid position was calculated by summing his 5 coefficients on each dimension and dividing each sum by 5. This produces an average or mean position on dimension 1 and dimension 2 which are then graphed to produce Nixon's centroid
position.

One hundred eighty-six (186) or 13.56% were not scaled because they had not answered enough of the questions and 81 (5.9%) were not scaled because their answers produced degenerate positions.

To calculate the distance between a respondent and a candidate position, the formula to determine the length of a hypotenuse of a right-angled triangle is used.

\[
\text{hypotenuse} = \sqrt{(\text{length of height})^2 + (\text{length of width})^2}
\]

The length of the sides of the triangle are easily determined by examining the coordinates of \(N_1\) and \(R\) in the space.

\[
\text{hypotenuse} = \sqrt{(3 - 1)^2 + (6 - 3)^2} = \sqrt{13} \approx 3.61
\]

Their predictions were more accurate for the Humphrey-Wallace pair (87%) and the Nixon-Wallace pair (78%).

The six dimensions of partisan attitude identified in The American Voter (1960, p. 129) are attitudes:
1) toward the Democratic candidate
2) toward the Republican candidate
3) toward parties as managers of government
4) toward groups
5) on foreign issues
6) on domestic issues

14. The dense parameter (.9681) and the rho (.422) are both above the minimum acceptable level.

15. The stress value of the one dimensional solution was so high (.623) that the solution was not interpreted. The two dimensional solution was chosen partially because its stress value occurred at an "elbow." This means it was the last solution to have a low stress level before the stress value of the one dimensional solution greatly increased. An "elbow criterion" allows you to organize the relations among the variables with the fewest possible dimensions and the lowest stress. The two dimensional solution was also easily interpretable.

16. A smaller percentage of the respondents (73.7%) were scaled in the 1976 analysis. The decrease was due to more respondents failing to answer questions. In 1972 13.6% of the respondents had too much missing data to be scaled and in 1976 that percentage climbed to 20.3%.
CHAPTER 5
A TEST OF A MODIFIED VERSION OF ELECTORAL CHOICE THEORY

INTRODUCTION

In the last chapter the assumptions that voters choose a candidate solely on the basis of issues was discussed. There is a substantial body of literature which suggests that even when issue evaluation influences the voting choice, issue voting does not occur if a voter projects his own position onto a candidate or is persuaded to accept the candidate's position as his own (Brody and Page, 1976; Markus and Converse, 1979; Page and Jones, 1979). When either projection or persuasion occur, the voter's electoral choice is influenced by his evaluation of the candidate in addition to or in lieu of his evaluation of the candidate's issue position. It will be argued that electoral choice theory (ect) should be expanded so that voters calculate their utility by evaluating both the candidate and his issue positions. This argument will be expanded and the selection of the candidate evaluation variable will be described in the next two sections. In the final section of the chapter, the modified ect will be tested in
the same way ect was tested in the last chapter. Voters'
candidate and issue evaluations will be scaled to produce
electoral spaces. The relative proximity of the voters and
respondents will then be examined to determine if voters choose
the candidate who provides them with more utility.

THE INCORPORATION OF CANDIDATE EVALUATION INTO
ELECTORAL CHOICE THEORY

It will be argued that there are important theoretical
and methodological reasons to include candidate evaluation
variables in ect. The theoretical reasons are 1) that
candidate evaluation is too important an influence on the
voting decision to be excluded, 2) the inclusion serves to
strengthen ect by correcting an apparently erroneous auxiliary
assumption and 3) there is nothing within ect which would
prohibit the inclusion of candidate evaluation. Methodologically,
it is also important that candidate evaluation be included.
Since it is so difficult to isolate the effects of issues
on voting, it is difficult to study and test ect. The
theoretical reason reasons for incorporation will be discussed
now.

First, a good theory should seek to include the most
important explanatory variables and candidate evaluation is
too important an influence on the voting decision to be
ignored. The importance of the candidate variables has been documented in several studies. In one of the most recent analyses, Kessel (1980) examined open-ended like and dislike responses (pertaining to candidates and parties) to determine the relative salience of issues and candidates. In most of the elections from 1952 to 1976, both issues and candidates were salient but, generally speaking, issues were more salient. The 1976 election was an exceptional election in that candidate variables were more important than issues. Other researchers found that candidate variables were important in the 1972 election (Steeper and Teeter, 1976; Popkin, Gorman, Phillips and Smith, 1976). Popkin, et al. asked respondents what they disliked about McGovern and found that twice as many of the answers referred to the candidate's attributes as his issue positions.

Although these and other empirical studies disagree whether issues or candidate attributes are the more important determinant of the vote, it appears that both are important and neither should be ignored. On the basis that both variables are important, it is argued that ect is incomplete and should be extended to include candidate attributes.

The second and third theoretical reasons to include candidate evaluation are that its inclusion would actually strengthen the theory by correcting an unrealistic auxiliary assumption and candidate evaluation is compatible with ect.
Ect requires that voters choose a candidate who provides them with the most utility, but there is nothing in the theory's core premise which prevents citizens from receiving utility from a candidate's attributes. As Fiorina (1977) asserts, a candidate's experience, leadership, administrative ability and intelligence are legitimate criteria on which candidates can be evaluated. The theory is strengthened when these evaluation criteria are added.

There is also a methodological reason to include candidate evaluation. While ect requires that researchers examine the impact of issue evaluation on the voting decision, a substantial body of literature suggests that it is difficult or impossible to disentangle the interrelationship of issues, candidates and voting (Brody and Page, 1976; Niemi and Weisberg, 1976; Markus and Converse, 1979; Page and Jones, 1979). It may be that candidate and issue evaluation are so bound together, that it would be almost impossible to do research on ect if it were necessary to work with "pure" issue evaluation variables which were not contaminated with the effects of candidate evaluation.

SELECTION OF A CANDIDATE EVALUATION VARIABLE

Now that the reasons for including a candidate evaluation variable have been examined, it is time to select a criterion on which to evaluate the candidates. A perusal of the empirical
voting research indicated that candidate competence is a criterion which would be compatible with ect. First, it has an important influence on the voting decision (Popkin, et al., 1976; Steeper and Teeter, 1976). Furthermore, it offers the voter an additional or alternative way to determine how much utility he will receive from a candidate. Candidates may promise a lot of things, but the voter needs a way to judge the likelihood that a candidate will deliver on his issue promises (Fiorina, 1975). Popkin, et al. (1976, p. 92) lists three reasons that competence is a relevant dimension of candidate evaluation:

1) The candidate's competence directly affects the probability of his being able to deliver output from the system once he is elected.

2) Much of what both the president and Congress do involves the general management of the country. Since the voter has only limited information he may vote for a candidate who seems capable of managing the country even if the candidate is not 'closest' to his specific issue preferences.

3) Finally, numerous problems will emerge during a candidate's term of office that he will have to solve but that neither he nor the voters can anticipate on election day. Competence in unfamiliar areas may be inferred from the perceived competence of the candidate in other areas.

To incorporate candidate competence into ect, a strategy was borrowed from Fiorina's model of party choice (1977). Candidate competence is used as a weight which increases or decreases the utility the voter already expects from the candidate's issue position. If a citizen perceives that two
candidates have the same issue position but one has more competence than the other, the citizen should expect greater utility from the more competent candidate.

OPERATIONALIZATION OF CANDIDATE COMPETENCE

To operationalize candidate competence it was necessary to decide whether to create one candidate competence measure for all five issues or to find a different measure for each issue. Although it would have been easier to use only one variable, it was necessary to use five candidate competence variables to prevent each candidate's issue positions from becoming too similar to each other (chapter 3 discusses the problems that the multidimensional scaling program has in providing a suitable scaling solution if all of one candidate's issue positions are too similar to each other).

The selection of five variables is a problem because the Center for Political Studies (CPS) does not provide good measures of candidate competence. An ideal measure would give the respondent an opportunity to evaluate the candidate's ability in a variety of areas. The following statements are provided as examples of good candidate competence measures.

Carter/Ford has demonstrated he is the leader who would effectively respond to our country's racial problems if he were elected president.
Nixon/McGovern has the knowledge and experience in foreign affairs to enable him to solve the dilemma which faces us in Vietnam.

Since it was only possible to work with the measures included in the CPS data, the best available questions were chosen. The following is a list of the competence variables (and corresponding issues) in each election.

### 1972

<table>
<thead>
<tr>
<th>issue</th>
<th>candidate competence variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>Nixon/McGovern as president would bring peace</td>
</tr>
<tr>
<td>Busing</td>
<td>Nixon/McGovern as president could be trusted</td>
</tr>
<tr>
<td>Inflation</td>
<td>The national government is doing a delightful/terrible job</td>
</tr>
<tr>
<td>Government Guaranteed</td>
<td>Nixon/McGovern has a presidential personality</td>
</tr>
<tr>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Marijuana</td>
<td>Nixon/McGovern as president would control crime</td>
</tr>
</tbody>
</table>

### 1976

<table>
<thead>
<tr>
<th>issue</th>
<th>candidate competence variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax</td>
<td>Carter/Ford as president would make government run better and make it more efficient</td>
</tr>
<tr>
<td>Marijuana</td>
<td>Carter/Ford as president would bring moral and religious standards to the government</td>
</tr>
<tr>
<td>Government Guaranteed</td>
<td>Carter/Ford as president would reduce unemployment</td>
</tr>
<tr>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Busing</td>
<td>Carter/Ford as president could be trusted</td>
</tr>
<tr>
<td>Health</td>
<td>Carter/Ford as president would reduce the cost and size of government</td>
</tr>
</tbody>
</table>
There are a number of problems associated with the use of these questions. First, they are not direct measures of candidate competence. For example, one question asks if the candidate has a presidential personality. For lack of a better question, it is necessary to assume that the citizen finds a candidate with such a personality to be more competent than a candidate without a presidential personality. The personality question does not directly measure citizens' perceptions about qualities or characteristics directly related to job performance.

A second problem is that the variables are not of a uniform type. Some of them are more related to attributes of the candidate such as trustworthiness and others are more related to issue actions (such as bringing peace or controlling crime). A third problem is that the issue related questions do not ask about a candidate's competence to make decisions in foreign policy, racial problems or any other area.

Fourth, the candidate evaluation questions available in 1972 are not as numerous or as good as the questions in 1976. In 1972 there were only four questions which asked about the candidate's ability to be president, so it was necessary to use a more general question as the ninth and tenth variables. The variable which was selected asks respondents to indicate their feelings about how the national government is doing its job. The respondent may give a positive evaluation (delighted with the job) or a negative evaluation (the government is doing a
terrible job). It is assumed the variable is a measure of Nixon's competence as president. To create a variable which measures McGovern's competence, the same variable was used but the coding was reversed so that when a respondent says the national government is doing a terrible job, McGovern's competence is coded positive and when the respondent is delighted with the job the national government is doing, McGovern's competence is coded negative.

Fifth, because the candidate competence variables are less than ideal, not all of the issue variables are paired with particularly appropriate competence variables. In only one instance is the pairing of the issue and competence variable obvious: Vietnam and the peace competence question are used together. With the remaining issues and competence variables the best available pairs were made.

In 1972 the crime competence variable seemed best suited for the marijuana issue since none of the other issues were related to crime. In 1976 the marijuana issue had to be paired with a different competence question since the crime variable was no longer available.

After Vietnam was paired with peace and marijuana was paired with crime, there were three issues and three competence variables left. None of the competence variables (presidential personality, government's job performance or trust in the president) seemed especially well suited for any of the issues.
A rather arbitrary decision was made to assign government's job performance to inflation since the president's job performance rating often goes up and down with the inflation rate. Of course, a president's rating also goes up and down according to other factors and this argument is not a very strong one, but a choice had to be made. Likewise, when the trust variable had to be paired with either busing or government guaranteed standard of living, a decision was made to pair it with an emotional issue such as busing. On an issue such as busing voters might be most interested in finding a trustworthy candidate who would carry out his promises. Finally, by process of elimination, presidential personality was paired with government guaranteed standard of living. Of all the competence variables, the personality variable was the poorest measure of competence. In 1976 when there were other variables available, presidential personality was omitted and government guaranteed standard of living was paired with a more appropriate variable.

In 1976 the competence variables are better. The competence question pertaining to moral and religious standards was paired with marijuana since some citizens feel that the use of marijuana is an example of a breakdown in the moral fiber of society. The unemployment competence variable was used with the government guaranteed standard of living since this issue encompasses the role of the government in providing jobs. The efficient government and reduced size of government competence questions were appropriate
for either the tax issue or the health issue. Size of government was paired with health because the issue was concerned with whether or not to expand the government's program of health services. It is recognized that the opposite pairings could have been made. Finally, the presidential trust variable was paired with busing again. Since there is no other obvious pairing for trust variable, it is reasonable to use it with busing in both sets of data.

Although there are a number of problems with the candidate competence questions which were used in the analysis, these variables were used because they do provide some measure of the voters' evaluations of the candidates' abilities. An alternative type of question was used to measure candidate competence, but there were even more problems when using these open ended questions which ask respondents what they like and dislike about the candidates. Different sets of responses were combined to create five different variables. A decision was made not to use these candidate competence variables because they increased the similarity of each candidate's issue positions enough so that there were problems in trying to use the scaling program.

Now that the variables have been chosen, a description of the creation of the competence variables and their use as weights will be given. All of the candidate competence variables have seven response categories which range from a positive evaluation
of the candidate's competence to a negative evaluation of the candidate's competence. A weighting scheme was created so that when the issue distance was multiplied by the variable, the distance would increase or decrease according to the evaluation. Since a neutral evaluation of a candidate should not influence the utility a respondent expects from a candidate, neutral evaluations were coded 1.0. The most positive evaluation was coded .4 and the most negative evaluation was coded 1.6. The responses to a statement that Nixon has a presidential personality are coded in the following way:

<table>
<thead>
<tr>
<th>.4</th>
<th>.6</th>
<th>.8</th>
<th>1.0</th>
<th>1.2</th>
<th>1.4</th>
<th>1.6</th>
<th>weight coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>question coding</td>
</tr>
</tbody>
</table>

Agree/+ Evaluation Disagree/- Evaluation

Figure 19
Coding of Candidate Competence Weights

With the coding scheme, issue distances decrease (i.e., utility increases) with positive candidate evaluations and increase (i.e., utility decreases) with negative candidate evaluations. Table 16 provides several examples of the effects of candidate competence weights on issue distance variables.
Table 16

Examples of the Effect of Candidate Competence Weights on Issue Distances

<table>
<thead>
<tr>
<th>issue distance</th>
<th>X</th>
<th>Candidate competence weight</th>
<th>weighted issue distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>.6</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>3</td>
<td>1.4</td>
<td></td>
<td>4.2</td>
</tr>
<tr>
<td>0</td>
<td>.4</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>1.0</td>
<td></td>
<td>4.0</td>
</tr>
<tr>
<td>6</td>
<td>1.6</td>
<td></td>
<td>9.6</td>
</tr>
</tbody>
</table>

Once the weighted issue distance variables were produced, the rank ordering and scaling techniques were used to produce a space in which candidates and respondents are located according to their proximity on the weighted issue distances. The results of the analysis of the 1972 and 1976 election are reported below.

A TEST OF MODIFIED ELECTORAL CHOICE THEORY'S PREDICTIONS ABOUT VOTERS' ELECTORAL CHOICES

1972 Election

The weighted issue distance variables were rank ordered in the line-of-sight program (see Table 17). Each issue distance variable is compared with each other issue distance variable producing 45 pairs of variables. The effect of the weighting is
Table 17

Rank Order Matrix of Respondent-Candidate Issue Distance Which has been Weighted by Candidate Competence Evaluation (1972)

<table>
<thead>
<tr>
<th></th>
<th>Nixon</th>
<th></th>
<th>McGovern</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gov</td>
<td>Marj</td>
<td>Bus</td>
<td>Infl</td>
</tr>
<tr>
<td></td>
<td>G'nt</td>
<td>Std</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nixon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov G'nt Std</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marj</td>
<td>6(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>9</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infl</td>
<td>14</td>
<td>12</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Viet</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>McGovern</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov G'nt Std</td>
<td>33</td>
<td>38</td>
<td>36</td>
<td>43</td>
</tr>
<tr>
<td>Marj</td>
<td>27</td>
<td>19(^c)</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>Bus</td>
<td>31</td>
<td>23</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>Infl</td>
<td>40</td>
<td>35</td>
<td>41</td>
<td>45</td>
</tr>
<tr>
<td>Viet</td>
<td>28</td>
<td>39</td>
<td>34</td>
<td>37</td>
</tr>
</tbody>
</table>

\(^a\)cell entries are the rank orders; 1 indicates the pair of issue distances that is closest together while 45 indicates the pair of issue distances that is farthest apart.

\(^b\)indicates a same-candidate pair of issues that is less similar than at least one different-candidate pair.

\(^c\)indicates a different-candidate pair of issues that is more similar than at least one same-candidate pair.

Dense = .95
Rho (differences and sums) = .619
to make already similar same-candidate pairs even more similar than the unweighted pairs were. The number of pairs which prevent total separation of the same-candidate pairs from the different-candidate pairs has decreased from 4 (of 45) pairs to 2 (of 45) pairs in the weighted space. Although an attempt was made to prevent the weights from exacerbating the separation, it was only a partial success.

The rank ordered pairs of weighted issue distances were scaled in the multidimensional scaling (MDS) program (see Table 18). As suggested by the substantial similarity of same-candidate pairs, the primary organization in the data is between candidates rather than between issues. In the unrotated space, the dimension which accounts for the most variance (sum of squares of SSQ = 6.58) is a candidate dimension on which all the issues except inflation are important. The second dimension is also a candidate dimension on which McGovern's positions on Vietnam and inflation are located at one end and Nixon's position on inflation are at the other. This dimension indicates that candidate's positions on inflation were polarized and perceived to be quite distinct from the other issues.

The dimensions were rotated using orthogonal principal axes rotation, but the solution was difficult to interpret. After rotation, all ten variables had large coefficients on the first dimension. The second dimension was difficult to interpret. Rotation made interpretation of the space difficult and added
Table 18
Multidimensional Scaling Coefficients of the Weighted Issue Distance Variables in 1972

<table>
<thead>
<tr>
<th>Issue</th>
<th>Unrotated Solution</th>
<th>Rotated Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dimension 1</td>
<td>dimension 2</td>
</tr>
<tr>
<td><strong>Nixon</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard</td>
<td>- .847</td>
<td>- .371</td>
</tr>
<tr>
<td>Marijuana</td>
<td>- .779</td>
<td>- .396</td>
</tr>
<tr>
<td>Busing</td>
<td>- .856</td>
<td>- .318</td>
</tr>
<tr>
<td>Inflation</td>
<td>- .536</td>
<td>- .783</td>
</tr>
<tr>
<td>Vietnam</td>
<td>- .851</td>
<td>- .417</td>
</tr>
<tr>
<td><strong>McGovern</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Guaranteed Standard</td>
<td>1.063</td>
<td>.320</td>
</tr>
<tr>
<td>Marijuana</td>
<td>.985</td>
<td>- .247</td>
</tr>
<tr>
<td>Busing</td>
<td>.957</td>
<td>.244</td>
</tr>
<tr>
<td>Inflation</td>
<td>.190</td>
<td>1.184</td>
</tr>
<tr>
<td>Vietnam</td>
<td>.674</td>
<td>.785</td>
</tr>
<tr>
<td>SSQ</td>
<td>6.575</td>
<td>3.424</td>
</tr>
</tbody>
</table>

Stress = .038

Nixon's Centroid | - .774 | - .457 |
McGovern's Centroid | .774 | .457 |
little explanation. For these reasons, the unrotated solution will be used in the rest of the analysis.

The unrotated space is an excellent solution (stress = .038) in which candidate polarization is evident on both dimensions (see Figure 20). In the 1972 unweighted space, candidate polarization occurred on only one of the two dimensions. The effect of the weights, then, is to increase the substantial differences which already exist between the candidates and decrease the importance of issues as the underlying organization in the space. The first dimension represents the polarization of the candidates on all the issues except inflation. Polarization of the candidates on inflation is evident on the second dimension. There is little evidence of either traditional partisan or new social issue cleavages between the candidates. The most reasonable interpretation stresses 1) the polarization of the candidates on all issues and 2) the separation of inflation from the other issues.

Comparing the weighted space to the unweighted space, it appears that the weights used on Nixon's positions had the effect of concentrating all the variables except inflation into a tight cluster. The weights had the opposite effect on Nixon's inflation position by pushing it from a central location to a less central location away from Nixon's other issue positions.

The weights acted to disperse McGovern's positions on the issues. His positions on Vietnam, guaranteed standard of living
Figure 20

1972 Weighted Space
and marijuana were pushed more toward the periphery of the space. The weights had the greatest influence on McGovern's busing and inflation positions. His busing position was the only issue position to move from the periphery to a more central location (it actually crossed to the other side of dimension 1). Inflation, on the other hand, moved from a very central location to a position far out on dimension 2.

The weights had a definite impact on the candidates' issue positions and the impact for each candidate was quite distinct. The weights pushed Nixon's positions closer together while they acted to disperse McGovern's positions toward the periphery of the space.

The nonmetric scoring program was again used to place the respondents in the space (see Figure 21). Figure 21 indicates the relative proximity of each respondent to the candidate's weighted issue positions. Of the 1372 respondents, 1079 (78.6%) were located in the space. The stress parameter for the space is .34 which is higher than the .29 stress parameter for the unweighted space.

Figure 21 indicates the proximity of respondents and candidates. As in the unweighted space, there are two concentrations of respondents, but the concentration near Nixon has now moved farther down into his segment of the space and the concentration closer to McGovern is now centrally located in the space quite a distance from McGovern's positions.
Figure 21

1972 Weighted Candidate and Respondent Space
Nixon's weighted issue positions are located within or very near a large concentration of voters. The weighting acted to pull Nixon's positions on marijuana and busing (which were a long distance from the concentration of voters in the unweighted space) toward the voters. As suggested earlier, the weighting had the opposite effect for McGovern. In the unweighted space, McGovern's inflation position was located at the edge of a concentration of voters and his position on marijuana was fairly close to the concentration. Once the weights are used, however, none of McGovern's positions is close to a concentration of voters. Although there are still respondents with more extreme positions than McGovern's positions, the preponderance of respondents are at the center of the space or in Nixon's segment of the space.

In summary, the weighted space is much like the unweighted space—only more so. Again, most respondents are centrally located and Nixon's positions are closer to more voters than McGovern's positions. The effect of the weighting is to draw Nixon closer to respondents and push McGovern farther away from them.

The ability of the weighted spatial solution to predict vote was examined (see Table 19). The prediction rate is 87.4% which is only 4% higher than the prediction rate found with the unweighted data. While this might seem a small increase, several things should be remembered. First, there was evidence
Table 19

Prediction of the Vote by Weighted Candidate-Respondent Issue Distances in 1972

<table>
<thead>
<tr>
<th>Voting Decision</th>
<th>Candidate Closest to Respondent</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nixon</td>
<td>McGovern</td>
<td>Total</td>
</tr>
<tr>
<td>Nixon</td>
<td>58.6(^a)</td>
<td>6.0</td>
<td>64.7</td>
</tr>
<tr>
<td></td>
<td>(418)</td>
<td>(43)</td>
<td>(461)</td>
</tr>
<tr>
<td>McGovern</td>
<td>6.6</td>
<td>28.8</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>(47)</td>
<td>(205)</td>
<td>(252)</td>
</tr>
<tr>
<td>Total</td>
<td>65.2</td>
<td>34.8</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>(465)</td>
<td>(248)</td>
<td>(713)</td>
</tr>
</tbody>
</table>

| | | | |
| Total correct prediction | 87.4% | \(^a\) cell entry is percentage of the total respondents |
| Total incorrect prediction | 12.6% | |
| \(\lambda = .643\) | | |

that the 1972 issue distance variables contained a substantial amount of projection or persuasion effects even before an attempt was made to introduce nonissue candidate evaluation via the weighting scheme. If this is the case, the improvement in prediction resulting from incorporation of candidate's competence should be minimal. The rate of prediction from 1976 data (which exhibited lesser amounts of projection and persuasion) will be examined later in this chapter. If the use of candidate competence weights improves prediction more in 1976 than in 1972, this will be additional evidence that projection/persuasion effects are more substantial in the 1972 data and, therefore, a small
improvement in prediction is understandable.

Second, even though prediction does not increase by much, the lambda shows a respectable increase from .533 (unweighted issue distances) to .643 (weighted issue distances). This indicates a stronger relationship exists between vote and weighted issue proximity than between vote and unweighted issue proximity. Even without the weights, many respondents were far enough away from McGovern's positions that their vote could be predicted without the effect of the weights. While the lambda is more sensitive to the stronger relationship between vote and weighted issue distances, it is still possible to correctly predict many voter's decisions on the basis of the weaker relationship between vote and unweighted issue distances.

Third, although other researchers have produced higher prediction rates, the rate of 87.4% in this analysis is respectable and it rests on a theory which provides an explanation for voting behavior and on an analysis which avoids some common methodological problems. Ect assumes that voters make electoral decisions to maximize their utility. Other research must rest on explanations which do not go beyond the assertion that voters choose the candidates they prefer. The researchers who use complex causal models have been successful in describing the relationships which exist between demographic and political variables and the vote, but less successful in explaining why the variables influence voting decisions and why the relationships
among the variables change. Methodological problems such as multicollinearity and heteroscedasticity associated with causal modeling can be intractable.

In summary, use of candidate weights produces a space in which candidate polarization is even more pronounced than it was in the unweighted space. The weights have very distinct effects on the candidates' positions. Nixon's positions are pushed closer to each other and to the voters. McGovern's positions are pushed farther from each other and the voters. Although candidate competence weights only increase prediction by 4%, there is evidence that the unweighted data already contained substantial candidate effects. The candidate competence weights are a means of making an important substantive addition to ectl. Without the incorporation of nonissue variables, there is a major discrepancy between political reality and ectl.

1976 Election

Candidate competence weights were also applied to the 1976 data. The analysis will be examined carefully to determine what effect the weights have when projection and persuasion effects in the issue distance variables are less important.

The line-of-sight program was used to rank order the weighted issue distance variables (see Table 20). Like the 1972 analysis, the effect of the weighting is to make already similar same-candidate pairs more similar than the unweighted
Table 20

Rank Order Matrix of Respondent-Candidate Issue Distance Which has been Weighted by Candidate Competence Evaluation (1976)

<table>
<thead>
<tr>
<th></th>
<th>Ford</th>
<th></th>
<th>Carter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gov</td>
<td>Marj</td>
<td>Bus</td>
<td>Tax</td>
</tr>
<tr>
<td></td>
<td>G'nt</td>
<td>Std</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ford</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov</td>
<td>16^a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marj</td>
<td>11</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Tax</td>
<td>17</td>
<td>22^b</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Hlth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov</td>
<td>31</td>
<td>27</td>
<td>29</td>
<td>37</td>
</tr>
<tr>
<td>Marj</td>
<td>30</td>
<td>19^c</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>Bus</td>
<td>39</td>
<td>24</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Tax</td>
<td>40</td>
<td>25</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Hlth</td>
<td>43</td>
<td>32</td>
<td>36</td>
<td>42</td>
</tr>
</tbody>
</table>

^a cell entries are the rank orders; 1 indicates the pair of issue distances that is closest together while 45 indicates the pair of issue distances that is farthest apart

^b indicates a same-candidate pair of issues that is less similar than at least one different-candidate pair

^c indicates a different-candidate pair of issues that is more similar than at least one same-candidate pair

Dense = .994
Rho (difference and sums) = .698
pairs were. Of the 45 pairs, only two pairs prevent total separation of the Ford-Ford pairs and the Carter-Carter pairs from the Ford-Carter pairs.

When the rank ordered pairs were scaled (see Table 21), the primary organization of the data is one candidate's set of positions versus the other candidate's set of positions. The unrotated space is a good solution (stress = .122) in which all ten variables have moderate or substantial loadings on the dimension which accounts for the most variance (SSQ = 8.605). The second dimension has Ford's health position arrayed at one end and Carter's positions on marijuana and government guaranteed standard of living arrayed at the other end. Since the second dimension is difficult to interpret and there is little of interest to say about the first dimension, the dimensions were rotated.

Even with principle axis rotation, the spatial solution is difficult to interpret. All of the variables except Ford's position on marijuana have substantial coefficients on the first dimension (SSQ = 9.069). The coefficients with the highest values indicate that the candidates are most polarized on traditional partisan issues: taxes, government guaranteed standard of living and health. The second dimension is an issue dimension rather than a candidate dimension. Ford's and Carter's health positions and Carter's busing position are arrayed against both candidate's positions on marijuana and
Table 21
Multidimensional Scaling Coefficients of the Weighted Issue Distance Variables in 1976

<table>
<thead>
<tr>
<th>Issue</th>
<th>Ford Unrotated Solution</th>
<th>Rotated Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dimension 1</td>
<td>Dimension 2</td>
</tr>
<tr>
<td>Busing</td>
<td>-.543</td>
<td>-.196</td>
</tr>
<tr>
<td>Tax</td>
<td>-1.032</td>
<td>-.130</td>
</tr>
<tr>
<td>Marijuana</td>
<td>-.574</td>
<td>.184</td>
</tr>
<tr>
<td>Government Guaranteed Standard</td>
<td>-1.150</td>
<td>-.005</td>
</tr>
<tr>
<td>Health</td>
<td>-1.116</td>
<td>-.877</td>
</tr>
</tbody>
</table>

| Carter                       |                        |                  |
| Busing                       | .783                   | -.173           | .719           | -.354           |
| Tax                          | .991                   | .206            | 1.012          | -.036           |
| Marijuana                    | .440                   | .404            | .524           | .288            |
| Government Guaranteed Standard | .839              | .544            | .945           | .329            |
| Health                       | 1.362                  | .043            | 1.333          | -.282           |

SSQ 8.605 1.392 9.069 .931
Stress = .122

| Ford Centroid | -.906 | .011 |
| Carter Centroid | .906 | -.011 |
government guaranteed standard of living. It is difficult to draw definitive conclusions about this particular arrangement of issues. One possible interpretation is that the dimension represents the difference between redistributive issues (busing and health) and regulative issues (marijuana and government guaranteed standard of living). This interpretation depends on the assumption that government programs in health and integration provide services and opportunities to disadvantaged people who would not receive them without the government's assistance. Marijuana and governmental guaranteed standards are regulative issues since the government seeks to control the behavior of citizens and economic groups to promote citizens' well-being. It is easier to support such an argument for marijuana than government guaranteed standards. While government guaranteed standards can be described as an attempt by the government to regulate the economy to promote economic prosperity, programs such as unemployment compensation or job training might be better classified as distributive policies. It probably is not wise to draw too many conclusions about this second dimension other than the fact that it accounts for little of the variance in the space (SSQ = .931).

Figure 22 shows the spatial arrangement of the candidate's rotated positions. In the weighted space, Ford's array of positions comes close to being a mirror image of Carter's array of positions. While this symmetry is somewhat evident in the
Figure 22

1976 Weighted Candidate Space
unweighted space, it is more pronounced in the weighted space. The effect of the weighting is to slightly concentrate each candidate's positions in his segment of the space. It should be noted that this slight concentration effect is quite different from the pronounced dispersion effect the weights had on McGovern's positions and the pronounced concentration effect the weights had on Nixon's positions.

As before, the nonmetric scoring program was used to indicate the relative proximity of each respondent to the candidate's weighted issue positions (see Figure 23). In this election, only 68.91% of the respondents were scaled. The decrease in the percentage of people who were placed in the space occurred because a substantial proportion of the sample (22.3%) failed to answer some of the questions. The stress parameter for the weighted space with respondents and candidates is .34. The stress parameter indicates this is only a fair scaling solution, but it is the same as the stress parameter in the weighted 1972 data. The stress parameters for the 1972 unweighted and 1976 unweighted respondent candidate spaces were lower (.29 and .30, respectively). It appears that the weights make it slightly more difficult to place respondents in the solution.

The distribution of respondents in the space is quite unlike the distribution of respondents in the unweighted space. Figure 23 shows one cluster of respondents in the center of the space with five additional clusters arranged in a circle
Figure 23

1976 Weighted Candidate and Respondent Space
around the first cluster. Two of Carter's positions and his centroid are located within or near a cluster. Four of Ford's positions are located near or within a cluster. His centroid is located inbetween three clusters.

In 1976 the weighted space does not appear to be very similar to the unweighted space. The weights have a pronounced effect on the distribution of the respondents in the space. In the unweighted space there was one particularly large cluster of respondents in the center of the space. In 1976 there is a circular pattern of six smaller clusters of respondents. Unlike the 1972 candidate competence weights, the 1976 weights had the effect of slightly concentrating the candidate's positions in the space. It would be difficult to determine which candidate won the election by inspecting Figure 23.

The weighted space was examined to determine how well it predicts vote (see Table 22). The percentage of correct predictions has gone from 72.2% (1976 unweighted) to 84.8%, an increase of 12.6% more correct prediction. Although the 1976 weighted prediction rate is not as high as the 1972 weighted prediction rate, the weights produce a substantial improvement. As suggested earlier, this ability of candidate competence variables to improve prediction depends on the degree of projection and persuasion in the issue proximity responses. The importance of candidate competence as a determinant of voting decision is reflected in the increase in the lambda from
Table 22

Prediction of the Vote by Weighted Candidate-Respondent
Issue Distances in 1976

<table>
<thead>
<tr>
<th>Respondent Voting Decision</th>
<th>Candidate Closest to Respondent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ford</td>
<td>Carter</td>
</tr>
<tr>
<td>Ford</td>
<td>40.9\textsuperscript{a}</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>(409)</td>
<td>(103)</td>
</tr>
<tr>
<td>Carter</td>
<td>6.8</td>
<td>43.9</td>
</tr>
<tr>
<td></td>
<td>(85)</td>
<td>(546)</td>
</tr>
<tr>
<td>Total</td>
<td>47.8</td>
<td>52.2</td>
</tr>
<tr>
<td></td>
<td>(594)</td>
<td>(649)</td>
</tr>
</tbody>
</table>

Total correct prediction 84.8\%  \(^a\) cell entry is percentage of the total respondents
Total incorrect prediction 15.1\%

\(\lambda\) .693

.433 (unweighted) to .693 (weighted).

In summary, the use of candidate competence weights produces a space in which candidate polarization increases. There is one weak issue dimension which is difficult to interpret in the weighted 1976 analysis. The weights act to slightly concentrate both candidate's positions. Unlike the 1972 analysis, the weights do not obviously push the candidates closer to or farther from respondents. The improvement in prediction is a substantial 12.6\%, suggesting that candidate competence weights have two advantages in this analyses. They serve to make an important
theoretical contribution to ecct and they improve prediction
when projection and persuasion effects are not already present
in the issue distance data.

A Discussion of Electoral Typologies and the 1972 and 1976
Elections

In the last chapter, a typology was devised to explain why
Nixon's and McGovern's distinct issue positions were accompanied
by a large amount of rationalization (a combination of projection
and persuasion) while Ford's and Carter's less distinct positions
were accompanied by minimal rationalization. There were four
types of elections identified in the typology depending on
whether respondents voted on the basis of issues alone, candidate
evaluation alone, both issues and candidate evaluation or some
other rationale. The 1972 election was identified as an election
in which candidates are evaluated on their distinct issue
positions and on the basis of candidate competence. Although
it was evident that the 1976 election was not a contest which
was decided solely on the basis of issues, it was unclear how
to classify it. Was it an election characterized by uninformed
rationalization in which voters were forced to project or adopt
issue positions or was it an election in which neither issue
voting nor candidate evaluation was of prime importance? The
answer would seem to be uninformed rationalization. In 1976,
the positions of the candidates were not distinct and candidate
competence does produce a substantial improvement in vote prediction.

It should be noted that when 1976 is classified as an election characterized by uninformed rationalization, this classification is based on a similarity to the "ideal" type of election in the typology. Although issue distinctions were blurred in 1976, it is still possible to predict 72% of the vote on the basis of issue distance. Also, this is not to say that single issue or party affect were not present as determinants of the vote. It seems likely partisan identification is reflected in an evaluation of the candidates on both issues and competence. The argument is that there is enough evidence that voters choose candidates on the basis of issues and competence not to label the contest a party affect election.

It must also be noted that while it is doubtful that single issue voting was so pervasive in 1972 or 1976 as to be the basic characteristic of either election, the direct refutation of such an assertion is not possible in this research. It is possible to note, however, that there is evidence of nonissue candidate evaluation in both elections (projection/persuasion and candidate competence in 1972 and candidate competence in 1976). Single issue voting is not characterized by this type of candidate evaluation.
Candidate competence weights have the effect of increasing the importance of candidate polarization and decreasing the importance of issue dimensions, but the specific effect of the weights on the candidate's positions varies. In 1972, the weights had the opposite effect on the two candidates' positions—concentrating Nixon's positions closer to each other and the voters and dispersing McGovern's positions away from each other and the voters. Despite this pronounced effect on each candidate's positions, the weights only improved the prediction rate by 4% in 1972. It has been suggested that the unweighted issue distance variables already contained substantial candidate evaluation effects through projection and persuasion and the weights were only able to add slightly to the candidate effects which were already present in the data. This raises questions about the ability of researchers to use survey data to determine the proximity of candidates and voters solely on issues.

In 1976, the weights produced a slight concentration effect on the candidate's positions. The weights also acted to rearrange some of the candidate's positions so that the arrangement of Ford's issue positions resembles a mirror image of Carter's issues. The use of the weights made it possible to correctly predict the vote of an additional 12.6% of the respondents.
In attempting to explain why rationalization occurred in the 1972 election when the issue positions of the candidates were different from each other, a typology of elections was introduced. Elections are categorized according to how different the candidate's issue positions are and how important nonissue criteria are in influencing the electoral decision. The 1972 election is classified as an election in which both issue and nonissue criteria are important. The 1976 election is an election in which nonissue criteria are important.

These results suggest it is important to incorporate nonissue criteria into eot. Evaluation of the utility a respondent receives from a candidate's issue positions and competence is quite compatible with eot. The incorporation of candidate competence serves to increase the prediction accuracy of the theory and make it more congruent with reality.
Endnotes

1 The decision to code the weights from .4 to 1.6 was made after experimenting with alternative coding schemes. Regardless of the election or the different candidate competence variables which were used, the best results were obtained when each of the seven possible response categories was differentiated from the other responses by an increment of .2. Other increments which were tried were .05, .1 and .3.

2 The dense and rho parameters (.95 and .62, respectively) are acceptable. The value of the dense is somewhat low, but acceptable. The value of the rho is well above the minimum .4 level.

3 One and nine-tenths percent (1.9%) fewer respondents were placed in the weighted space than in the unweighted space. The decrease in scalded respondents occurred because more people had not answered enough of the questions to be scaled. In the unweighted space, 186 people (13.56%) failed to answer enough questions while in the weighted space 216 people (15.74%) did not answer enough questions. With the weighted data, the number of people not scaled because their answers produced
degenerate positions was 77 (5.6%) which is slightly less than the 81 people (5.9%) who had degenerate positions in the unweighted space.

4The values of the dense (.994) and rho (.698) parameters are much greater than minimum acceptable levels.

5The 22.3% of the people with missing data in the weighted 1976 data set compares with 13.6% in the unweighted 1972 data, 15.7% in the weighted data and 20.3% in the unweighted 1976 data. There was also 8.8% of the weighted 1976 sample which were not scaled because their position was degenerate.
CHAPTER 6
THE EQUILIBRIUM COMPONENT OF ELECTORAL CHOICE THEORY

INTRODUCTION

There are two components of electoral choice theory (ect). The first part, which focuses on the determinants of individual electoral behavior, rests on the assumption that a voter chooses the candidate whose issue positions provide him with the greatest utility. A second part is concerned with the effect of the candidates' issue positions on the social choices made in the electoral process. More specifically, it focuses on the candidates' attempts to adopt issue positions that appeal to a majority of the voters. Assuming that voters and candidates seek to maximize their utility, candidates will come to rest at convergent equilibrium positions (if additional assumptions are made).

It is the second component of ect which will be examined in this chapter. This component is intriguing because it goes beyond the usual individual-level explanation of voting behavior to examine the societal consequences of utility maximization.
The first section will focus on two types of convergent equilibrium solutions and their assumptions. In a convergent equilibrium solution both candidates have a nonperipheral position at the voters' median issue position. This means that both candidates have the same (or very similar) nonextreme positions on the issues. Data will be examined to determine whether the assumptions are congruent with political reality. Then, the predictions of convergent equilibrium positions will be tested in the second section. Using the electoral spaces which were produced in earlier chapters, candidate and voter positions will be examined to determine if the candidates rest at an equilibrium.

EQUILIBRIUM SOLUTIONS AND THEIR ASSUMPTIONS

Theorists have used two different sets of assumptions to produce convergent equilibria solutions. The first set, which is a more traditional set of assumptions often used by theorists, depends on the shape of the individual's utility function. It is impossible to directly test all the assumptions in this set because the necessary data are not available. The second set of assumptions depends on the shape of the electorate's utility function and survey data can be used to determine how congruent the data are with the assumptions. Although both sets of assumptions have been tested in this
analysis (as far as possible), the full set of results will not be reported in this chapter to spare the reader the tedium of sifting through fifty pages of text, graphs and tables which report subjective findings that are open to different interpretations. Rather, there will be a discussion of the problems that plague attempts to test the assumptions, a brief description of the assumptions and a summary of data-assumption congruency.

Testing and Evaluation Difficulties

There are two major problems that make it difficult to evaluate the consistency between ect's predictions and assumptions. First, because many of the conclusions about data-assumption consistency are based on visual inspections of electoral spaces, they are quite subjective. A second related problem is that it is difficult in such an exploratory study to know how much variance can exist between the assumptions and reality if the theory's predictions are to occur. Theorists have suggested the congruence must be complete (Plott, 1967; Fiorina, 1975), but the congruence thresholds are still unknown.

Description of the Equilibrium Assumptions

Although the emphasis will be placed on the aggregate assumptions which are more readily tested, the more traditional assumptions (i.e., those based on individual's utility functions)
Figure 24
Quadratic Utility Function

Figure 25
Quasi-Quadratic Utility Function
will be described because they are so often used by theorists.

Solutions Based on the Individual's Utility Function

The most common set of assumptions which produce a convergent equilibrium is listed below:

1. There is complete candidate mobility.
2. The individual's utility function is quadratic or quasi-quadratic.
3. The distribution of preferences is radially symmetric and unimodal or bimodal.

A brief explanation of these assumptions will now be provided.

1. The complete candidate mobility assumption is simple and straightforward. A candidate must be free to take any issue position, and that includes the freedom to move past his opponent's issue position.

2. The quadratic or quasi-quadratic requirements are related to the increase in utility an individual receives as the alternatives become farther removed from his ideal position. Both quadratic and quasi-quadratic functions are symmetric, but they differ in the rate at which utility decreases. In a quadratic function, the utility must decrease at an increasing rate. Figure 24 provides an example of a function in which there is a steadily increasing rate in the decline of utility (see $u_1$, $u_2$, and $u_3$) that do not conform to any particular pattern.
There is no direct way to determine if individual utility functions are quadratic or quasi-quadratic because survey questions do not measure the utility a respondent receives from all the suboptimal policy alternatives. Out of necessity, an aggregation of the sample's utility function was used as an indirect test of ect. It is recognized, however, that even if the sample's utility function is quadratic, the individual's utility function may not be.

3. Although symmetric unimodal distributions are more likely to produce convergent equilibrium, symmetric bimodal distributions produce the same result if the effects of alienation and/or indifference are not too great (Riker and Ordeshook, 1973, p. 343) and if the candidate has complete issue mobility. This symmetry and modality assumption requires that the respondents are clustered around one or two alternatives in such a way that every citizen located near a mode is balanced by another citizen who has a diametrically opposed preference.

Solutions Based on Aggregate Utility Functions

McKelvey (1975) has devised an unusual set of assumptions which ensure equilibrium and do not depend on the individual's utility function. Rather, his assumptions pertain to the electorate's utility function which he calls the candidate's support function. McKelvey explicitly states two assumptions and implies a third assumption. He also provides three
optional sets of assumptions. The first three assumptions
plus any one of the sets are necessary to produce an equilibrium.

A list of the assumptions follows.

1. The aggregated utility function is metrically
   symmetrical. AND

2. The distribution of voters is characterized by
   radial symmetry. AND

3. The candidates have complete mobility (implicitly
   stated). PLUS

First Set of Assumptions: 1) There is a unimodal
   distribution of voters, 2) A candidate's support is characterized
   by strong discrimination and 3) The candidates have concentrated
   support. OR

Second Set of Assumptions: 1) There is a unimodal
   distribution of voters, 2) Candidates have concentrated support
   and 3) Candidates have symmetrical support. OR

Third Set of Assumptions: 1) The candidates have
   extremist support.

Assumptions Common to All of McKelvey's
Solutions

First, the three assumptions which are required in all of
McKelvey's equilibrium solutions will be discussed. McKelvey
requires that the candidate's support functions (i.e., the
utility function of the sample) be characterized by metric and
radial symmetry. Metric symmetry requires that support for
a candidate is a function of the relative distance of the
two candidates from the voters' ideal positions. In Figure 26
candidate 1 is equally supported by voters x and y since they
are equidistant from candidate 1. Voters z and w will have the
same support for candidate 2 that voters x and y have for candidate 1 because the respondent-candidate distances are the same in all four instances.

The second assumption requires that the distribution or density of voters' preferences is radially symmetric around the voters' median preference. If there are equal numbers of people at points diametrically opposite each other in the distribution, the requirement is met. Figures 27a and 27b are examples of radial symmetry.

Complete candidate mobility requires that a candidate have the freedom to take any issue position, even if he must go past his opponent's position. While McKelvey does not list this as one of his assumptions, he seems to assume that candidates have the freedom to take any position since he
27a. A Unimodal and Radially Symmetric Utility Function

27b. A Bimodal and Radially Symmetric Utility Function

Figure 27

Examples of Radially Symmetric Utility Functions

discusses a solution in which the candidates switch positions with each other (p. 819).

McKelvey's First Set of Optional Assumptions

This set requires that the candidate support function is characterized by strong discrimination and concentrated support and the distribution of voters' preferences is unimodal. As indicated earlier, a unimodal distribution of voters is one in which voters cluster around one position. When strong discrimination exists, the citizen is unlikely to vote for a candidate who is far from his own ideal point when the opposing candidate is close. To illustrate this requirement,
McKelvey bisects the citizen's support function so that the shaded region belongs to candidate 1 and the other region belongs to candidate 2 (see Figure 28). None of the voters in the shaded area will vote for candidate 1 and none of the voters in the other area will vote for candidate 2.

Figure 28
Example of Strong Discrimination
(Source: Figure 6a, p. 824 of McKelvey's article "Policy Related Voting")

The second assumption requires that a candidate's supporters must be concentrated in one pocket of support so their indifference contours enclose convex sets (concentrated support). Figure 29 provides an illustration of concentrated support. The concentrated support assumption is unlike the unimodal assumption
in that concentrated support applies to each candidate's supporters while the unimodal assumption refers to all citizens.

McKelvey's Second Set of Optional Assumptions

This set requires that the distribution of voters be unimodal and the candidates have concentrated support and symmetric support. The first two assumptions have already been described. Symmetric support requires that voters be symmetrically arrayed around a candidate's position. Symmetric and radial support have different center points around which the distribution is measured: the center point is the electorate's median position for radial symmetry and a candidate's position for symmetric support.
McKelvey's Third Set of Optional Assumptions

The third set has only one requirement: voters with the most extreme policy preferences are the candidate's most loyal supporters. Under conditions of extremist support, voters who are located far from the candidate's position are more likely to support the candidate. This means that extremist supporters report even higher levels of utility than voters who are closer to the candidate.

Assumption-Data Consistency

This review of equilibrium assumptions indicates that ecet has strong assumptions which require very specific types of voter distributions and utility functions. Fiorina (1975) has cautioned that when a theory requires a specific distribution or function, even small deviations from the requirement may substantially alter the predictions. Plott (1967, p. 795) suggests that deviations are likely to exist and "...equilibrium under majority rule would seem to be an almost nonexistent phenomenon."

In the next two sections data has been used to test the equilibrium assumptions. A summary of the results of each assumption will be reported, but full results and documentation will be provided for only a few key aggregate assumptions (details of all the analysis are available from the author upon
request). If Plott and Fiorina are correct to suggest that equilibrium will not occur unless there is complete congruence, evidence of deviation between even a few assumptions and the data will indicate that an equilibrium is very unlikely. First, the findings pertaining to the assumptions based on individual level utility functions are examined and then assumptions based on aggregate level utility functions are discussed. Finally, the detailed analysis of the key aggregate assumptions are reported.

Summary of the Results of Data-Individual Level Assumptions Congruency Analysis

1. A candidate must be free to take any issue position and to move past his opponent's issue stance. This assumption is usually made by electoral choice theorists, yet it contradicts much of our understanding of American politics. Page (1978) has examined the speeches and position papers of recent presidential candidates. He concludes that candidates normally take consistent unchanging policy stands in an election campaign. In 1968, Nixon and Humphrey took inconsistent positions or changed their positions on only 7% of the issues (Page, 1978, p. 113). The only candidate who is likely to change issue positions within a campaign is a presidential nominee perceived to have extreme issue positions. Although a candidate such as Goldwater or McGovern may try to adopt more moderate positions
with which to appeal to the entire electorate, neither of them changed his positions so drastically that he moved past his opponent's positions.

The evidence suggests that, contrary to ext, candidates do not have complete mobility. It is possible, however, that the candidate's ability to make appeals to specialized audiences does allow the candidates to take more extreme issue positions and still enhance their support. Candidates may propose specific policy proposals to special groups which the electorate would find unacceptable (Page 1978, p. 150). Fishel (1977, p. 9) emphasizes that candidates use "back-channel" communication with special groups which are considering joining a candidate's coalition of supporters. "Back-channel" communication includes positions papers, interviews and speeches developed for specific groups and it tends to contain more detailed policy information than mass media campaign information. Although the candidates do not necessarily take contradictory positions or jump past their opponent's issue position, issue appeals to specific groups do allow candidates to take unusual or noncentrist positions. By making such appeals a candidate has the opportunity to increase his support at the same time he takes a position which would not be popular with a majority of voters.

2. The individual's utility function is quadratic or quasi-quadratic. Unfortunately, individual level data are not available to test the assumption. When the sample's aggregated
utility functions on the separate issues are examined, the requirement is not met.

3. The distribution of voters must be radially symmetric and unimodal or bimodal. When the voter's distribution in the weighted electoral spaces is examined, the most reasonable conclusion is that the 1973 space approximates symmetric bimodality and the 1976 space approximates symmetric multimodality. This judgment is difficult to make, however, since the voters' distribution is not the even continuous function that theorists assume. It is often difficult to tell if a smaller heavily concentrated group of voters is offset by a larger more dispersed group.

Summary of the Results of the Data-Aggregate Level Assumptions Analysis

1. The aggregate utility function is metrically symmetrical. This is an interesting assumption that requires candidate support to be a function of the respondent's distance from the candidate; in fact, support is a function of distance (relative proximity) and direction (ideological bias). It should be noted, however, that the effect of the bias is most pronounced on the few voters who are located far from the candidates. For most of the sample, the predicted relation between distance and support is found.
2. The distribution of voters is radially symmetric. As indicated in the last section, it is difficult to be sure, but the distributions of voters in the weighted spaces seem to approximate radial symmetry.

3. The candidates have complete issue mobility. As indicated in the last section, candidates are not mobile but the importance of this discrepancy may be lessened by the ability of candidates to offer inconsistent policies to specialized groups of voters.

First Optional Set of Assumptions. 1) As indicated earlier, there was no evidence of unimodal voter distributions. 2) Candidate support is not characterized by strong discrimination since 13-15% of the respondents voted for the candidate who was farther away. 3) There is little evidence that candidates receive concentrated support in 1972 but in 1976 candidates did receive support which approximated the requirements of concentrated support.

Second Optional Set of Assumptions. 1) Unimodal distribution of voters is not supported by the data. 2) Concentrated support is evident in the 1976 but not the 1972 data. 3) Candidate support is characterized by symmetrical support. There is only limited evidence that supporters surround their candidate's position in convex rings and no evidence that any support function is symmetrical.
Third Optional Set of Assumptions. 1) There is evidence that extremists do have unusually high levels of support, but they fail to report more support than voters close to the candidates. The data and assumption are not sufficiently congruent.

Detailed Research Findings for Key Assumptions

McKelvey has produced three combinations of assumptions and each of them is capable of producing a convergent equilibrium. If it is possible to show there is a marked inconsistency between the data and even one assumption in each set, none of McKelvey's solutions should produce an equilibrium. An examination of the assumption-data results indicates the data are inconsistent with at least one assumption in each set. There is marked inconsistency between the unimodal voter distribution (from the first and second sets) and the extremist support (from the third set) assumptions and the data. The complete analysis and documentation of the analysis of these two assumptions follows.

Unimodal Voter Distribution

To determine if the distribution of voters is unimodal, voters' ideal positions in the electoral spaces were examined. To make inspection easier, contours which follow the density of the respondents' ideal points have been drawn in each space.
The red curve encloses the most heavily concentrated groups of voters (usually 7 to 9 or more people in each position). The green curve encloses solid masses of people who are less heavily concentrated (1 to 6 people in each position). Finally, the black curve contains more sparsely distributed voters. The cases outside the black contours are the most sparsely distributed voters in the space. The citizens' multidimensional median preference (Md) has also been indicated. (Color coded figures are available from author upon request.)

The electoral spaces indicate that unimodality does not exist in either election. In 1972 (see Figure 30) there are two heavily concentrated modes, one around Nixon's position and the other in McGovern's side of the space. There are no less than six modes in the 1976 space (see Figure 31). Although a large number of respondents makes it more likely there will be a large number of modes and even though there is a large number of respondents in the 1976 space, there is little reason to believe a unimodal distribution exists in either space. This belief is buttressed by the strong candidate separation which was evident in the rank ordering and dimensional coefficients which were reported in the last chapter. The failure of the data to be congruent with the unimodal assumption makes it unlikely that the first or second set of assumptions will produce equilibrium.
Figure 30

Distribution of Citizens' Issue Preferences in 1972 (Weighted Data)
Figure 31

Distribution of Citizens' Issue Preferences in 1976 (Weighted Data)
Extremist Support

The second key assumption requires that extremists (voters with the most extreme policy preferences) express stronger support for a candidate than voters who had positions similar to the candidate's position. To test the extremist support assumption, support was operationalized as candidate thermometer scores and the pattern of support of citizens close to and far from the candidate are examined.\(^4\)

In 1972 conservative extremists (people in the +5 and +6 categories) reported Nixon thermometer scores in the 35 to 72 degree range while voters close to Nixon reported scores in the 52 to 79 degree range. McGovern's thermometer ratings from liberal extremists (those in the -5 and -6 categories) were in the 8 to 56 degree range but the thermometer ratings from voters close to McGovern were higher (51 to 79 degrees). While the extremists gave the candidates unexpectedly high thermometer scores, the requirements of ES are not met because extremists do not report higher levels of support than voters close to the candidate (see Table 23).

In 1976 there was a similar pattern of support for Ford and (to a lesser degree) for Carter (see Table 24). Conservative extremists reported Ford thermometer scores from 40 to 60 degrees but none of these scores is as high as scores reported by voters close to Ford. The pattern of extremists' support
Table 23
1972 Sample's Aggregated Utility Function

<table>
<thead>
<tr>
<th>Issue Distance</th>
<th>Wilson's Issue Positions</th>
<th>McGovern's Issue Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gov Std</td>
<td>Marj</td>
</tr>
<tr>
<td>Liberal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>28(b)</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>(42)(a)</td>
<td>(32)</td>
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<td>49</td>
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<td></td>
<td>(22)</td>
<td>(22)</td>
</tr>
<tr>
<td>-4</td>
<td>45</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>(42)</td>
<td>(34)</td>
</tr>
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<td>57</td>
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<tr>
<td>-2</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>74</td>
</tr>
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<td>73</td>
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<tr>
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<td>75</td>
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<tr>
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<td></td>
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<tr>
<td>6</td>
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<td>32</td>
</tr>
<tr>
<td></td>
<td>(12)</td>
<td>(9)</td>
</tr>
</tbody>
</table>

\(a\)This is the distance between a candidate's position on the seven-point scale and the respondent's position.

\(b\)Respondents' mean candidate thermometer scores.

\(c\)Number of respondents in each cell.

Issues: Government Guaranteed Standard of Living (Gov. G'nt. Std.)
Marijuana (Marj)
Busing (Bus)
Inflation (Infl)
Vietnam (Viet)
### Table 24
1976 Sample's Aggregated Utility Function

<table>
<thead>
<tr>
<th>Issue Distance &amp; Direction</th>
<th>Ford's Issue Positions</th>
<th>Carter's Issue Positions</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Gov G'nt Std</td>
<td>Marj Std</td>
</tr>
<tr>
<td>-6</td>
<td>29</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>(81)</td>
<td>(28)</td>
</tr>
<tr>
<td>-5</td>
<td>36</td>
<td>47</td>
</tr>
<tr>
<td>-4</td>
<td>41</td>
<td>53</td>
</tr>
<tr>
<td>-3</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>(146)</td>
<td>(117)</td>
</tr>
<tr>
<td>-2</td>
<td>56</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>(156)</td>
<td>(104)</td>
</tr>
<tr>
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<td>62</td>
</tr>
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<td>(201)</td>
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</tr>
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<td></td>
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<td>67</td>
</tr>
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<td></td>
<td>(296)</td>
<td>(174)</td>
</tr>
<tr>
<td>2</td>
<td>67</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>(221)</td>
<td>(153)</td>
</tr>
<tr>
<td>3</td>
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<td>57</td>
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</tr>
<tr>
<td></td>
<td>(24)</td>
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<tr>
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<td>52</td>
</tr>
<tr>
<td></td>
<td>(51)</td>
<td>(16)</td>
</tr>
</tbody>
</table>

*a this is the distance between a candidate's position on the seven-point scale and the respondent's position

*b matrix are respondents' mean candidate thermometer scores

*c number of respondents in the cell

**Issues:**
- Government Guaranteed Standard of Living (Gov. G'nt Std.)
- Marijuana (Marj)
- Busing (Bus)
- Taxes (Tax)
- Health Care (Hlth)
for Carter is unusual. Both liberal and conservative extremists report scores that are high, but not as high as scores reported by nonextremists. As in 1972, however, extremists' support levels are not high enough to meet the requirements of extremist support.

These results suggest that ideology influences the levels of support that voters have for the candidates. To better understand the relationship of ideology and support, the relationships reported in Tables 23 and 24 were controlled for ideology. The results of only one of the issue controls are reported in Table 25. The effect of the control on the other relationships shown in Tables 23 and 24 was very similar to the effect found in Table 25.

As suspected, it is conservative extremists and liberal extremists who report especially high utility. The effect of ideological bias is not, however, confined to these extremists. Ideology affects candidate support scores of all respondents. Looking across the rows in Table 25 at groups of liberals, moderates and conservatives who are equidistant from the candidate, conservatives receive more utility from Nixon than do liberals who are the same distance from him. Likewise, of the liberals and conservatives who are equidistant from McGovern, the liberals receive more utility from his position than conservatives do.
Table 25
1972 Sample's Aggregated Utility Function for Government
Guaranteed Standard of Living Position
Controlled for Ideology

<table>
<thead>
<tr>
<th>Issue Distance and Direction</th>
<th>Nixon's Position</th>
<th>McGovern's Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liberal</td>
<td>Moderate</td>
</tr>
<tr>
<td>-6</td>
<td>20</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>(23)</td>
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<td></td>
<td>(19)</td>
<td>(6)</td>
</tr>
<tr>
<td>-3</td>
<td>42</td>
<td>56</td>
</tr>
<tr>
<td></td>
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<td>-2</td>
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<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
</tbody>
</table>

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*a* this is the distance between a candidate's position on the seven-point scale and the respondent's position.

*b* respondent's mean candidate thermometer score

*c* number of respondents in each cell

*d* voter control groups are categorized according to self-placement on an ideology question.
The results of the control suggest the data fail to meet extremist support requirement that ideology is so important that it overwhelms the relationship of candidate support and issue proximity for extremists. In fact, ideology does intervene in the relationship between support and issue proximity but 1) the intervention occurs for all groups of voters and 2) the intervention on extremists' scores is not great enough to satisfy extremist support.

The analysis of data-assumption consistency has produced numerous examples of incongruence or partial congruence. One possible conclusion is that the assumptions and data are incongruent enough that equilibrium will not occur. After all, Fiorina (1975) and Plott (1967) have suggested that congruence must be complete.

It is possible, however, that the candidates will take equilibrium positions even though there is data-assumption incongruence. There are a number of reasons that this could occur. First, there may be enough error in the data that consistency between the assumptions and reality is obscured. Admittedly, this explanation will not be sufficient to explain the amount of inconsistency found in this analysis. It should be recognized, however, that as long as the attempt to test formal theory involves survey data, some allowance must be made for the nature of the data.
Second, the assumptions which the theorists have described may be sufficient but not necessary to produce and equilibrium. If this is the case, it will not matter whether the assumptions which have been discussed are congruent with the data because it will be another set of assumptions which are responsible for producing the equilibrium. If this is the case, the problem is to determine what the necessary assumptions are.

Third, it is possible that the theory is more robust than Fiorina and Plott have suggested that although the assumptions and data may be partially inconsistent, the predictions of the theory will hold. To illustrate the plausibility of this suggestion, the findings pertaining to one of McKelvey's sets of assumptions will be reviewed.

McKelvey indicates that if there is 1) metrically symmetric aggregate utility function, 2) a radially symmetric distribution of voters, 3) candidates with complete issue mobility and 4) extremist support, candidates will converge to an equilibrium. The evidence indicates that 1) the aggregate utility function of most voters is metrically symmetric, 2) the voters approximate radial symmetry in the weighted space, 3) candidates' ability to offer inconsistent policies to special groups of voters may partially counteract the fact they are not completely mobile and 4) there is evidence that extremists do have unusually high levels of support even though they do not completely satisfy the extremist support requirement.
The question is whether this is enough data-assumption congruence to expect that the predictions will hold. Unfortunately, the only current standard used to judge data-assumption congruence is complete consistency. If complete consistency is not required, then there is no benchmark which can be used as a base comparison for congruence. Establishing such a benchmark would seem to be a reasonable goal for two reasons. First, as mentioned, there is the error in the survey data. Second, if complete congruence is necessary, testing the assumptions becomes little more than a futile exercise in proving that what cannot exist (i.e., complete congruence) cannot exist. And if the assumptions by definition do not hold, then the predictions cannot be expected to occur. Electoral competition theory would be little more than a mathematical exercise on paper which would not be worth pursuing. But it seems that ECT has much to offer as an explanation of why people act as they do on both the individual and society wide level. To insist upon the purity of its assumptions without exploring the bounds of acceptable consistency is to rob the theory of its potential to explain.

In summary the problem of data-assumption consistency remains unsettled. It should be noted that even if it could be established that complete data-assumption congruence is not necessary, it would still be unclear whether the level of consistency found in this analysis is high enough so that the predicted behavior should occur. Although the problem remains unsolved, the next
step is to determine if candidates do locate at a convergent equilibrium.

PREDICTION OF EQUILIBRIUM CANDIDATE POSITIONS

In earlier chapters respondent and candidate positions were analyzed to determine whether relative candidate-respondent issue proximity accurately predicted how citizens voted. This analysis will now be expanded and the following questions will be asked:

Are the positions which the candidates actually choose equilibrium positions?

Given the utility functions and distributions of voters in the data, are there positions the candidates could adopt which would be equilibrium positions? Are there any divergent equilibrium positions?

Do enough voters choose a candidate on the basis of utility so that the candidate who is predicted to win actually does win?

Before an attempt is made to answer these questions, some background information will be provided. First, there will be a description of terminology which will be used in the analysis. Second, a brief definition of equilibrium solutions and the test for equilibria will be provided.
Terminology

Candidate positions are described in terms of their proximity to voters. In this analysis the term central and centrist will be used interchangeably to refer to a number of positions in the nonperiphery of a space. These terms could be used to refer to any of the following:

1) A position that is near the voters' median issue position.
2) A position that is near a large cluster of voters who are not in the periphery of the space.
3) A position that is half way down and half way across the space.
4) A position that is ideologically moderate.

In this analysis the term central or centrist will be used to refer to either the first or second usage of the term.

Although analysis in previous chapters was based on the positions that candidates took on five issues, in this chapter the focus will be on the candidate's centroid (average) position in the space. The centroid position will be used because it predicts as well as the candidate's five individual positions and its use simplifies the analysis. Each candidate's centroid position will be referred to as the candidate's actual position. Other positions which the candidate could have chosen are the
potential candidate positions. Pairs of potential positions will be examined to determine what percentage of votes a candidate could have expected to win if he had chosen a different position and if citizens always voted for the closer candidate. A candidate's expected percentage of the vote is his predicted vote.

Definition of and Test for Equilibrium

Since equilibrium is one of the main focuses of this chapter, a brief explanation of an equilibrium solution will be provided. Electoral competition theorists who assume complete candidate mobility, unimodal and symmetrical distribution of voter preferences and quadratic utility functions predict convergent equilibrium solutions. Given their assumptions, the predicted convergent equilibrium solutions can be understood on an intuitive basis. When candidates are equidistant from the voters' median preference they have an equal share of the vote. But when one candidate is closer to the center than the other, the more central candidate will win more votes. Because of the symmetrical and unimodal distribution of voters and the voters' choice of a candidate who is closer, candidates who are located in any two positions that are equidistant from the median will equally divide the vote (see Figure 32a). Since the candidates are defined to be an equal distance from the median, the median becomes the bisector which divides one candidate's region from
the other candidate's region. By definition there is an equal number of voters on each side of the median. Equidistant positions are not necessarily stable positions, however. Assuming complete candidate mobility, either candidate stands to gain by moving toward the center. When one candidate (see candidate 1 in Figure 32b) moves closer to the center than his opponent, the voters between the two candidates remain equally divided, but the candidate closer to the center (C1) increases the number of voters who are between his position and the edge of the distribution. The opposing candidate can win a larger share of the vote by moving past candidate 1 to a location that is closer to the center of the distribution. This process of maneuvering can continue until each candidate places himself at the center and no longer has an incentive to move (see Figure 32c).
In this analysis an equilibrium solution is characterized by an equal division of the vote and a stable situation in which neither candidate has an incentive to move. To test for equilibrium the predicted vote of pairs of potential positions will be examined to determine if either candidate has an incentive to move. Since each candidate prefers a majority of the vote, any candidate will have an incentive to move if he gains 50.0% or less of the vote. An equilibrium can exist only if the candidates take positions which provide a majority of the vote or positions from which they cannot expect to win a majority even if they do move.

Unfortunately, the procedure of comparing a series of potential positions to look for stable solutions which equally divide the vote is tedious and imprecise. This technique involves a number of steps. First, the electoral space is visually inspected and a pair of potential candidate positions are chosen. Second, the coordinates of each of these positions in the space are estimated and a new variable is created in the data set to represent each of the two potential positions. Then, using the computer, the percentage of voters who would have been closer to each potential candidate position is calculated. It is predicted that the citizens will vote for the closer candidate.
It is impossible to check all or even a substantial minority of the potential positions. The specification of the positions is also a problem. Once the electoral spaces were examined and the potential points were chosen for consideration, the specification of these potential positions was no more than the best guess of what coordinates would place the candidates at or near the desired position (the coordinates of the candidates' positions are listed in Appendix B). In the future more precise and systematic techniques may be developed to choose, specify and test positions to see if they serve as equilibria. For now, this imprecise and inelegant methodology will be applied to the four data sets.

Results of the Equilibrium Analysis

1972 Unweighted Data

Figure 33 displays candidate's actual and potential positions in relation to the red, green and black voter concentrations. Although many positions could have been examined, only a few were selected to test ect's predictions about central positions and equilibrium. The following list describes the different positions in the space:

A - Actual centroid position of candidates (produced in scaling program)

Cc - Position candidate would have taken if he had centered himself within the most densely concentrated group of voters (the red group)
Figure 33

Mixon’s and McGovern’s Actual and Potential Positions (Unweighted 1972 Data)

Description of the Candidate’s Positions

A - Actual position
Cc - Position in the center of the red concentration
Cm - Position at the median
Ca' - Mixon’s modified median position
Z & F - Positions far from the median
Cm - Position candidate would have taken if he placed himself at the median of the voter distribution

Cm' - Position slightly to the side of Nixon's red group

F - Position which is located far out on dimension 1 beyond the actual positions

E - Peripheral position which is located far out on dimension 2

Md - The median of the voters' distribution on each dimension.

Table 26 contains a summary of the predicted vote for the candidates' actual positions and for each pair of the potential positions that were examined. Two conclusions can be drawn from an examination of the candidates' actual positions. First, Nixon's predicted share of the vote is 58.5% while the actual vote he received is an even larger 65.2%. The discrepancy between the actual and predicted vote (6.8%) is substantial, which raises questions about the usefulness of ect. In an earlier chapter electoral competition theory's ability to correctly predict the vote of 84% of the sample seemed respectable. Within the context of the discipline's ability to predict political behavior from survey data this is a reasonably high level of prediction. But when a variation of the same data is examined from the perspective of precisely defined assumptions which are required if precisely defined candidate solutions (i.e., equilibrium) are to be produced, the discrepancy seems
Table 26

Nixon's and McGovern's Actual and Predicted Share of the Vote (Unweighted Data)

<table>
<thead>
<tr>
<th>Description of Candidate Positions</th>
<th>Predicted Vote Nix- McGovern</th>
<th>Actual Vote Nix- McGovern</th>
<th>Discrepancy between Predicted and Actual Vote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58.5</td>
<td>41.2</td>
<td>65.2</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>Pair</td>
<td>Nixon's Position</td>
<td>McGovern Position</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>Cc</td>
<td>52.8</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>Cm</td>
<td>58.5</td>
</tr>
<tr>
<td>McGovern more central than Nixon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cc</td>
<td>A</td>
<td>62.7</td>
</tr>
<tr>
<td>4</td>
<td>Cm</td>
<td>A</td>
<td>78.9</td>
</tr>
<tr>
<td>Nixon more central than McGovern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cm</td>
<td>Cm</td>
<td>52.8</td>
</tr>
<tr>
<td>6</td>
<td>E</td>
<td>E</td>
<td>53.3</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>F</td>
<td>54.1</td>
</tr>
<tr>
<td>Nixon and McGovern are equidistant from median</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cc</td>
<td>Cc</td>
<td>49.5</td>
</tr>
<tr>
<td>Candidates are positioned in relation to red group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Cm'</td>
<td>Cm</td>
<td>51.2</td>
</tr>
<tr>
<td>10</td>
<td>Cc</td>
<td>Cm</td>
<td>44.8</td>
</tr>
<tr>
<td>11</td>
<td>Cm'</td>
<td>Cc</td>
<td>55.5</td>
</tr>
<tr>
<td>Candidates are positioned in various central positions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
large. Second, the division of the vote is so uneven that the actual positions are not an equilibrium solution; since this is the case, pairs of potential positions will now be examined to determine if an equilibrium exists.

Similar types of potential positions have been grouped together in Table 26. In pairs 1 and 2, McGovern has a more central location than Nixon; and, as ect predicts, McGovern wins a majority of the vote. When Nixon has the more central location (pairs 3 and 4), he too wins a majority of the votes. The first four pairs provide evidence to support ect's prediction that central locations provide the candidate with a majority.

For equilibrium to exist, ect requires an uniformly symmetrical distribution of voters. As Figure 33 indicates, however, the voters within the red contours are markedly more concentrated than the voters within the green and black contours and transition between the different groups is not smooth. The red groups are also noteworthy in that they are not arranged symmetrically around the median. Nixon's red group is vertical to the median while McGovern's group is horizontal to the median.

Two central positions were created to examine the effect of the red concentrations. The first position, Cm, is very close to the median of the voter preferences. The second position, Cc, is located at the center of each red contour. When both candidates are located at Cm (pair 5), the division
of the vote favors Nixon (52.8%) over McGovern. Even though
Cm position is close to the median, the predicted vote is not
equally divided between the candidates. Nixon presumably gets
more than half of the vote because the voters' distribution
is uneven and asymmetrical.

Pairs 6 and 7 are equidistant from the median and located
more on the periphery of the space. Position E (pair 6) is
positioned quite a distance out on both dimensions while
position F (pair 7) is located far out on dimension one. With
either pair, Nixon wins more votes (53.3% with E and 54.1% with
F). Positions E and F provide additional evidence of the impact
of the red concentrations in the space. When a bisector is
drawn between the two E positions (see E' in Figure 33), part
of McGovern's red concentration is located in Nixon's segment
of the space, providing Nixon with a greater share of the vote
than he would have had if voters had been evenly distributed.

The distribution of the vote is less equal with the pair of
F positions even though the F bisector (see F' in Figure 33)
leaves all of McGovern's red concentration within his region.
In this instance, the unequal division is probably due to a
heavier concentration of voters in Nixon's red and green
concentrations.

Nixon and McGovern's Cc positions (pair 8) are examined
next. If the candidates both choose a location within their
red concentrations, McGovern would win slightly more than a
majority of the vote (50.5%). The Cc positions produce a very equal split in the vote and it is possible that if these positions were better centered in the red concentration they would produce a 50/50 split.

To determine if an equilibrium exists, two scenarios are presented. First, as long as 1) the split is not completely equal and 2) Nixon perceives that he will need to move to gain the additional .5% of the vote to produce a tie, the solution is unstable. If Nixon only moved as far as Cm' (a position located between Cc and Cm), he would win a majority regardless of whether McGovern stayed at Cc (pair 11) or moved in as far as Cm (pair 9). If Nixon did not perceive the incentive to move toward the center and remained at Cc while McGovern moved in to Cm (pair 10), McGovern would win 55.2% of the vote. Second, if the Cc positions were adjusted to produce a completely even split, McGovern would have an incentive to move to Cm and win 55.2% of the vote (pair 10). Nixon could then move to either Cm (pair 5) or Cm' (pair 9) and win a majority of the vote. Once Nixon moves into Cm or Cm', there is little McGovern can do to produce a tie or win a majority. As long as Nixon can move to Cm or Cm' and win the pair of Cc positions (#8) does not constitute an equilibrium. Either pair 5 or 9 provides a stable convergent solution but neither produces an equal split in the vote.
It is not clear that either pair 5 or 9 qualifies as an equilibrium. Although pair 9 (Cm and Cn') produces quite an even division of the vote, Nixon would have no way to predict that Cm' would be a good position. Nixon's Cm' position does not have any particular characteristics (such as being close to the median or in the center of the red group) to make it an obvious choice. It was initially included in the analysis as one of several experiments. The problem with the pair of Cm points as an equilibrium (pair 5) is that it produces an unexpectedly uneven division of the vote. But since the pair of Cm positions is a predictably good pair of positions and since it produces a solution in which the candidates are unlikely to move because they lack an incentive or an opportunity for improvement, it may qualify as an equilibrium.

The positions which produce most equal division of the vote (pairs 8 and 9) are located quite centrally in the space. Even though the positions closest to the median do not provide the most even division of the votes, there is substantial evidence that ect's prediction about the importance of central positions in producing majorities is supported by this evidence. Considering the uneveness of voter distributions and the asymmetry of the red concentrations of voting it is surprising that ect's predictions are supported as well as they are.
1972 Weighted Data

Potential pairs of candidate positions were also examined in the weighted 1972 space in which the candidate evaluation variables were incorporated. Since the red voter concentrations were shaped differently in the weighted data (see Figure 34), some changes were made in the potential positions that were examined. There is a change in the relationship of Nixon's A and Cc positions. In both data sets Nixon's Cc position is found in the center of his red concentration; in the weighted data, however, Nixon's actual position is also centrally located so the difference between his A and Cc positions is small. In the previous analysis, the F positions were equal distance from the median on both dimensions; in this analysis the F positions are an equal distance from the median on dimension 1, but Nixon's F is closer to the median on dimension 2 than McGovern's F.

Although changes were made in the potential positions, the analysis of the weighted data is quite similar to the analysis of the unweighted data. As Table 27 indicates, Nixon's share of the predicted vote increases from 58.5% to 60.4% and his actual share decreases slightly from 65.2% to 64.7%. The discrepancy between actual and predicted vote decreases from 68% to 4.1%. Even so, this discrepancy could make quite a difference in the prediction of a close race.
Figure 34

Nixon's and McGovern's Actual and Potential Positions (Weighted Data)

Description of the Candidate's Positions
A - Actual position
Cc - Position in the center of the red group
Cm - Position at the median
Cm' - Nixon's modified median position
E & F - Positions far from the median
Table 27

Nixon's and McGovern's Actual and Predicted Share of the Vote (Weighted Data)

<table>
<thead>
<tr>
<th>Description of Candidate Positions</th>
<th>Predicted Vote</th>
<th>Actual Vote</th>
<th>Discrepancy between Predicted and Actual Vote</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nixon</td>
<td>McGovern</td>
<td>Nixon</td>
</tr>
<tr>
<td>Actual Positions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60.6%</td>
<td>39.4%</td>
<td>64.7%</td>
</tr>
<tr>
<td>Pair Drop Nixon's Position</td>
<td>1</td>
<td>A</td>
<td>Cc</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>A</td>
<td>Cm</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Cc</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Cm</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Cm</td>
<td>Cm</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Cc</td>
<td>Cc</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Cm'</td>
<td>Cm</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Cc</td>
<td>Cm</td>
</tr>
</tbody>
</table>

Nixon and McGovern are positioned in relation to red group

<table>
<thead>
<tr>
<th>Nixon and McGovern are positioned in various central positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>
Again, potential candidate positions were examined (see Table 27). Pairs 1, 2, 3 and 4 illustrate that the more central location is the winning location. In pair 1 McGovern is somewhat closer to the center at Cc than Nixon is at A but McGovern wins only .4% more of the vote. When McGovern is at Cm and Nixon is at A, McGovern has a more comfortable majority (52.9%) of the vote. While neither of these majorities is large, pairs 3 and 4 illustrate that if McGovern fails to move in from his A position while Nixon moves closer to the center, Nixon would win large majorities of 60.3% (pair 3) and 69.7% (pair 4).

When the candidates are equidistant from the median, the division of the vote is more equal. With pair 5 (both candidates at Cm) and pair 6 (both candidates at E), the division is quite even. This even division does not exist for the Cm and E positions in the unweighted data, suggesting that the effect of the candidate evaluation weights is to increase the symmetry of the distribution of voters. The last pair of positions in this group examines the division of the vote when both candidates are at F. It should be remembered that McGovern's F location is farther out on dimension 2 than Nixon's F location is. Nixon wins a more substantial majority (52.2%) with this partially equidistant pair.

Finally, the Cc position in the red concentrations were examined in pair 8. When the candidates are located relative
to their red concentration of supporters, the division of the vote (49.8% for Nixon and 50.2% for McGovern) is closer to being equal than any other division in the analysis.

Since equal distance from the median does not appear to be a crucial factor in producing an equal division of the vote, an additional pair of central but asymmetrical position is examined. In pair 9 Nixon's Cm' position is paired with McGovern's Cm position and the split is quite equal but not as equal as the division produced by the Cc positions.

In the weighted 1972 data the distribution of voters seems to be uneven or asymmetrical enough so that positions equidistant from the median do not provide the most equal division of the vote. Even so, the Cm pair is the equilibrium solution because it is stable and the Cc pair is not. The Cc solution is unstable because Nixon has an incentive to move toward the center. If Nixon moved to Cm while McGovern stayed at Cc, Nixon would win 54% of the vote (pair 10). The Cm solution (pair 5) is stable even though McGovern only receives 49.4% of the vote. As long as Nixon stays at Cm, McGovern cannot win a majority. McGovern could only win if he stayed at Cm and Nixon moved to Cc (pair 11) and Nixon has no reason to do this.

Two conclusions can be drawn about ect's equilibrium predictions. First, an equilibrium exists at the median of the voter distribution. Second, the candidate's actual positions are not at an equilibrium but Nixon comes closer to choosing
an equilibrium position than McGovern does.

1976 Unweighted Data

The distribution of the voters in the unweighted 1976 space (see Figure 35) is quite different from the pattern found in the 1972 data. There are many respondents in the 1976 data and this produces a large red concentration of voters that is located in the center of the space. This large concentration is surrounded by five smaller red concentrations.

Like the analysis in 1972, there are a number of potential positions which are examined in this analysis.

A - Actual positions the candidates chose
Cm - Positions which are close to the median
0 - Positions which are across from each other and found on the outside of the large red concentration
E - Positions which are across from each other and located between the most central red concentration and the outlying red concentration
F - Positions which are located farther out on dimension 1 than the actual positions
X & Y - Positions which are equidistant from the median in opposite directions

In the 1976 data, the actual distribution of the votes provided Carter with only a 2% margin over Ford (see Table 28). The discrepancy between the actual and predicted vote is so great that Ford's predicted share of the vote was 57.5%. The
Figure 35
Ford's and Carter's Actual and Potential Positions (Unweighted Data)

Description of the Candidate's Positions
A  - Actual position
M  - Position at the median
E  - Positions located between the large red group and smaller red groups
F  - Positions located beyond A on dimension 1
X & Y - Positions equidistant from median
Table 28
Ford's and Carter's Actual and Predicted Share of the Vote (Unweighted Data)

<table>
<thead>
<tr>
<th>Description of Candidate Positions</th>
<th>Predicted Vote</th>
<th>Actual Vote</th>
<th>Discrepancy between Predicted and Actual Vote</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ford</td>
<td>Carter</td>
<td>Ford</td>
</tr>
<tr>
<td>Actual Positions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57.5</td>
<td>42.5</td>
<td>49.0</td>
</tr>
<tr>
<td>Pair</td>
<td>Ford's Position</td>
<td>Carter's Position</td>
<td>Predicted Vote</td>
</tr>
<tr>
<td>1 Carter more central than Ford</td>
<td>A</td>
<td>Cm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3 Ford more central than Carter</td>
<td>Cm</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Candidates are equidistant from median</td>
<td>Cm</td>
<td>Cm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Candidates are positioned in various central positions</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>E</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
discrepancy of 8.5% turned a predicted substantial victory for Ford into a close Ford loss. This is the largest discrepancy which has been found and it raises questions about the ability of ect to predict either the winning candidate or the victory margin.

As in other analyses, pairs 1 through 4 indicate that the more centrally located candidate will win the majority of the vote. Pairs 5, 6 and 7 are positions which are equidistant from the median. As the division of the vote indicates, these symmetrical equidistant positions do not necessarily produce an even division of the vote. When both candidates are centered at the median (pair 5), Nixon receives 55.3% of the vote. While the candidate's X positions at the periphery of the red concentration produces a more even 51.5/48.5% split in the predicted vote, it is the intermediate equidistant pair Y (86) that produces a nearly equal division of the vote. It is not clear why the Y positions produce such an even division while other symmetrical equidistant pairs do not. It would appear that when it is this difficult to provide a post hoc explanation of Ys' equal division, it is unreasonable to expect candidates to be able to choose the Y positions as an equilibrium solution. The one conclusion which can be drawn from these puzzling results is that the asymmetry and uneveness of the voters' distribution of preferences makes explanation of the findings and prediction of an equilibrium difficult.
None of the positions which were selected on the basis of their relation to the red concentrations (pairs 8, 9 and 10) produces an equal vote division. When the candidates are 1) directly beyond the median (positions F) or 2) in diametrically opposed positions slightly beyond the red concentration (positions 0), Ford wins. But when another set of diametrically opposed positions slightly beyond the red concentration is chosen (positions E), Carter wins.

In pairs 5 through 10 Carter wins once (positions E) and comes close twice (positions X and Y). The one thing these three positions have in common is that they place Carter in the left segment of the space. Ford, on the other hand, is able to win three substantial majorities and two narrow majorities from a variety of positions. The only position which really hurts Ford is E, located in the right region of the space. Neither candidate does well in position beyond the red concentration on the right hand side of the space. Conversely, both candidates do well when they are located outside the red concentration in the region left of the median. Again, it appears the asymmetry of the distribution influences the results.

1976 Weighted Data

This distribution of voters in the 1976 weighted space is quite unusual in there are six red concentrations (see Figure 36). The one concentration which surrounds the median is
Figure 36
Ford's and Carter's Actual and Potential Positions (Weighted Data)

Description of the Candidate's Positions
A  - Actual position
Dm  - Position at medium
S/L  - Pairs which are equidistant from the medium
F/N  - Fairs
S/N  - Saffs
R/A  - Fairs which are positioned in relation to the red groups
C/A
D/G

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encircled by the other five concentrations. The two largest concentrations are located in the lower right quadrant. Since the distribution is unusual, the potential points which were examined are somewhat different than positions examined in the last three analyses. There is a series of positions (N, C, J, F and Carter's A) located in the red concentrations. Positions X and M are equidistant symmetrical points at the periphery of the green concentrations. Positions D, L, O and B, located between red groups, will be tested as midpoints between various combinations of red concentrations. Finally, of course, there are the Cm positions at the median and the candidates' actual positions. In terms of actual positions, Carter is located within the top red concentration and Ford is positioned almost directly below him inbetween two red concentrations.

Table 29 indicates that the 1976 weighted data Carter's predicted share of the vote (51.3%) is .5% greater than his actual share (50.8%). Since the discrepancy between predicted and actual share of the vote has decreased from 8.5% (unweighted data) to .5%, the candidate evaluation weights appear to have made a marked improvement in the prediction capability of the data.

The first four pairs of positions indicate that the candidate who is closer to the center of the distribution will win the majority of the vote. Pairs of positions which
Table 29

Ford's and Carter's Actual and Predicted Share of the Vote (Weighted Data)

<table>
<thead>
<tr>
<th>Description of Candidate Positions</th>
<th>Predicted Vote</th>
<th>Actual Vote</th>
<th>Discrepancy between Predicted and Actual Vote</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ford</td>
<td>Carter</td>
<td>Ford</td>
</tr>
<tr>
<td>Actual Positions</td>
<td>48.7</td>
<td>51.3</td>
<td>49.2</td>
</tr>
<tr>
<td>Carter more central than Ford</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>A</td>
<td>Cm</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>A</td>
<td>J</td>
</tr>
<tr>
<td>Ford more central than Carter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Cm</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>D</td>
<td>A</td>
</tr>
<tr>
<td>Candidates are equidistant from median</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Cm</td>
<td>Cm</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>X</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>D</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>F</td>
<td>N</td>
</tr>
<tr>
<td>Candidates are positioned in relation to different concentrations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>F</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>D</td>
<td>O</td>
</tr>
</tbody>
</table>
are equidistant and symmetrical were examined next (see pairs 5 and 8). When the positions are equidistant and the bisector which separates the positions is horizontal (pairs 5 and 6), the division of the vote is more even (50.7/49.3 for pair 5 and 48.6/51.4 for pair 6) than when the bisector is vertical or has a vertical slope (52.1/47.9 for pair 7 and 52.6/47.4 for pair 8). In pairs 7 and 8 Ford wins more of the vote because the large red concentrations on the right side of the space are in his region while in pairs 5 and 6 both candidates win part of the largest concentration (which contains F). The asymmetry of the distribution does not produce very unequal splits but it does indicate there are more voters on the right half of the space.

In the last group of pairs, positions were arranged in relation to the red concentrations. When Ford and Carter take positions F and N (this is pair 8 which has already been discussed), Ford receives 52.6% of the predicted vote. In pairs 9 and 10, Carter remains at A and Ford moves to the left (pair 9) or the right (pair 10). When Ford moves left to position B, his share of the vote decreases to 47.9%. When Ford moves right toward the large concentrations, his share decreases even further to 41.6%. It appears that although Ford needs to be able to attract the voters in these large concentrations, he loses a great deal of middle ground by moving far to the right to position C. In pair 11 each candidate was placed in the middle of the three red concentrations (Ford at D and Carter
at 0); although it initially appeared that this would provide an equal vote split, Carter wins 55.3% of the vote by capturing the three red concentrations on the left plus part of the middle red group.

There are several conclusions which can be drawn from the equilibrium analysis of the 1976 weighted data. First, the candidate evaluation weights produce important improvements in the prediction by decreasing the discrepancy between predicted and actual vote. Second, the weights also make the distribution more symmetrical. This second conclusion should not be over-emphasized since some of the equidistant symmetrical candidate positions produce only semi-equal divisions in the vote. Third, with six red concentrations it is difficult to find two positions located within concentrations which produce an equal vote split. And, fourth, the Cm positions do provide 1) the equal division of the vote which is essential if an equilibrium is to exist and 2) the centrally located position from which candidates would not have an incentive to move. On this basis, it is concluded the Cm positions are the potential equilibrium points. Finally, the actual candidate positions do produce a semi-equal division of the vote but they do not serve as an equilibrium since Ford had an incentive to move to a position which would provide him with a greater share of the vote.
Summary of the Equilibrium Results

The equilibrium analysis has been reported for the four data sets. This section will focus on general trends (see Table 30) which occurred in the four analyses. First, there is a sizable discrepancy between actual and predicted vote in most of the data sets. The discrepancy is large enough that the candidate who is predicted to win sometimes loses. Although the candidate evaluation weights greatly reduced the size of the discrepancy in the 1976 data (from 8.5% to .5%), the discrepancy between predicted and actual vote in the weighted 1972 data was still large (4.1%).

Second, most of the time, the analyses provide support for one of ect's most basic predictions: when one candidate is closer to the citizens' median preference, he will win the election. The exceptions occur in the weighted and unweighted 1972 data. In both analyses, the Cm positions are located at the medians and Nixon's Cm' position is located between his Cm and Cc position. In both analyses when McGovern is located at Cm and Nixon is located at Cm' (farther away from the median than McGovern is) Nixon wins a majority of the vote (see pair 9 in Table 26 and pair 9 in Table 27).

Third, the degree of symmetry of the different distributions varies a great deal. In the 1972 unweighted data set, the distribution is not symmetrical. None of the equidistant
Table 30
Summary of the Equilibrium Results

<table>
<thead>
<tr>
<th>Discrepancy between actual and predicted vote</th>
<th>1972 Unweighted</th>
<th>1972 Weighted</th>
<th>1976 Unweighted</th>
<th>1976 Weighted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large (6.8%)</td>
<td>Sizable (4.1%)</td>
<td>Very large (8.5%)</td>
<td>Very small (.5%)</td>
</tr>
<tr>
<td>Is voter distribution symmetrical?</td>
<td>No</td>
<td>Weighted increase symmetry (but red groups still unsymmetrical)</td>
<td>No</td>
<td>Generally, yes</td>
</tr>
<tr>
<td>Do more central locations produce majorities?</td>
<td>Yes (except pair 9)</td>
<td>Yes (except pair 9)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Do Os positions produce = vote division?</td>
<td>No, not very (52.8/47.2)</td>
<td>Yes (50.6/49.4)</td>
<td>No (55.3/44.7)</td>
<td>Yes (50.7/49.3)</td>
</tr>
<tr>
<td>Do other positions equidistant from median produce = vote division?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Do Cc positions produce = vote division?</td>
<td>Yes</td>
<td>Yes</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Does potential equilibrium exist?</td>
<td>Probably, if equal division requirement is relaxed</td>
<td>Yes, Cm</td>
<td>Probably not</td>
<td>Yes, Cm</td>
</tr>
<tr>
<td>Are actual candidate positions at an equilibrium?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
symmetrical positions produce an equal division of the vote. While the voter distribution in the weighted 1972 electoral space does not appear to be symmetrical when the distribution is scanned, two symmetrical and equidistant pairs of positions (Cs/Cs and E/E) evenly divide the vote. McGovern's small red concentration seems to be partially offset by his much larger green concentration which extends far into the periphery. The balance between McGovern's green and red concentrations makes the distribution more symmetrical than it initially appears.

The unweighted 1976 data gives the visual appearance of approximating symmetry, but Cm/Cm positions produce an uneven division of the vote. When other equidistant positions that are farther away from the median are examined, the division of the vote is more equal. The key to producing an equal split is both distance from the median and the angle at which the bisector divides the distribution into two segments. This indicates that the distribution is not completely symmetrical but certain segments are symmetrical with other segments.

The effect of the candidate evaluation weights is to increase the symmetry of the 1976 data. The Cm positions produce an even division of the vote. Other equidistant positions produce equal or semi-equal splits, suggesting the weighted 1976 data is generally symmetrical.
Fourth, when there is one red concentration for each candidate, the division of the vote will be equal if both candidates locate within these concentrations. It should be noted that red concentrations of this type do not exist in either of the 1976 electoral spaces. An equal division of the vote is only one of two prerequisites of an equilibrium.

Fifth, a potential equilibrium can be identified in the weighted data sets but it is difficult to determine if there are equilibrium locations in the unweighted electoral spaces. Although positions in the red concentrations in both of the 1972 spaces produce a fairly equal division of the vote, they do not qualify as an equilibrium because at least one candidate has an incentive to move. Even if the division of the vote is tied at a 50/50 split, each candidate has an incentive to win a majority by moving closer to the center.

Since the closer candidate normally wins the majority, the place to look for equilibria is at the median positions (Cm). These positions produce quite an even division of the vote in the two weighted electoral spaces. Presumably the even division occurs because these spaces are symmetrical.

When the unweighted electoral spaces are examined it is questionable or unlikely that a potential equilibrium exists. The Cm positions produce unequal divisions of the vote (52.8/47.2% in 1972 and 55.3/44.7% in 1976). In 1972 even though McGovern has an incentive to try to win more than his 47.2%
of the vote but there are no positions he can take to win once Nixon locates at Com. This means that the Com pair does not produce an equal division, but it does produce a stable solution in which there is no incentive for Nixon to move and no location McGovern can move to for a majority. If the equal division of the vote requirement were relaxed, the median positions in the 1972 unweighted space would qualify as an equilibrium.

In 1976, however, a potential equilibrium position does not seem to be available in the unweighted electoral space. The equidistant positions at the median produce a markedly unequal division (55.3/44.7%) while another equidistant pair (the Y positions) which is farther away from the median produces an equal division that fails to constitute an equilibrium for two reasons. First, the candidates would have no way to predict that the Y locations would produce an equal vote split. Second, one candidate could try to increase his share of the vote by moving to the center and the solution would become unstable.

Finally, the existence of actual equilibrium positions were examined. None of the candidates chose equilibrium positions in the four analyses, but Nixon's position was fairly close in the weighted space. This answers (as far as any one project answers) the question about whether candidates do choose equilibrium positions. In providing the answer, however, the analysis produces evidence of an anomalous situation. Although
the theorists seem to assume that data-assumption incongruence will make it impossible for candidates to locate equilibrium positions, there is evidence of incongruence and there is evidence that potential equilibrium positions do exist which the candidates could take.

SUMMARY AND CONCLUSIONS

The analysis of the assumptions raised a lot of questions about the congruence of the data and the equilibrium assumptions of ect. The analysis provided evidence that some sets of assumptions and the data are incongruent. There was, however, at least partial congruence between one set of assumptions and the data. The question is whether, contrary to Plott's view of assumptions, this partial congruence is enough so that ect's predictions will occur. Although the analysis is too exploratory to establish a benchmark for the amount of data-assumption congruence which must exist if the predictions are to hold, it does suggest that partial congruence is sufficient (see p. 223 for an example of partial congruence which may be sufficient). In the last chapter a research strategy is suggested to determine what level of congruence might be necessary.

With the uncertainty about whether there was sufficient data-assumption congruence to expect that predictions would hold,
the analysis then moved to determine whether candidates did arrive at a convergent equilibrium. The results indicated a potential equilibrium does exist at the voters' median position in the weighted space. Candidates, however, do not maximize their utility by choosing the equilibrium position. It is not possible to be sure whether the predicted equilibrium does not occur because the assumptions do not hold or whether the theory simply fails to explain and predict candidate behavior.

The analysis in this chapter will now be considered from several different perspectives. First, since evidence was presented in chapter five that candidate competence weights are important, why were both the unweighted and weighted spaces presented in this chapter? The use of both spaces is helpful because it provides a more substantial data base from which to draw conclusions. It is difficult enough to detect trends in four analyses without having to try to interpret the trends in two analyses. Also, the comparison of the weighted and unweighted spaces indicates the importance of candidate weights. They have the effect of 1) decreasing the discrepancy between predicted and actual vote, 2) making the distribution of voters more symmetrical and 3) producing potential equilibrium positions the candidates could take.

Second, what lessons or implications can be drawn from the spaces to help candidates in their campaigns? In this regard, the weighted spaces are the appropriate spaces for the candidates
to study because they are the better representation of the voters' evaluations of electoral phenomena. Beyond this, however, the analysis is not as productive in formulating guidelines for a candidate's campaign strategy. If the analysis were based only on issue evaluation, the advice to candidates would be simple: locate as close to the voters' median issue preference as you can. It is not as easy, however, to give candidates explicit advice on projecting an image of competence. Of course, a candidate should seek to project as positive and competent image as he can, but a candidate does not need a nonmetric spatial analysis to tell him this. When a candidate competes in the weighted space and he is evaluated on both issues and competence, he must simultaneously try to minimize the distance between himself and the voters while he strives to appear as competent as possible. The candidate's prime objective is still to move toward the voters' median position and to hope that he will simultaneously be perceived to be competent enough to be pushed even closer to the median.

The use of candidate evaluation weights in this analysis has been exploratory and many questions remain to be answered. For example, why did the candidate evaluation weights have different effects on the 1972 and 1976 spaces? In 1972 the weights did not change the number of voter concentrations but had the effect of moving Nixon closer to voters in this region of the space and McGovern farther away from voters in his region
In 1976, however, the effect of the weights was to increase the number of voter concentrations from 2 to 6 and to scatter the concentrations throughout the space. Until the effect of the weights in producing these different outcomes is better understood, it is difficult to give candidates advice about campaign strategy. There will be a discussion of some of the remaining questions and possible research strategies for answering them in the next chapter.
Endnotes

1 Ordeshook (1976) has called for bargaining sets of alternative candidate positions rather than solutions which provide each candidate with one location. Any position within a bargaining set would provide the candidate with more votes than any position that was not a part of the set. For the candidate, the disadvantage of having to rely on a bargaining set location would be that another bargaining set location could provide even more votes. Since no bargaining set position will always provide the candidate with the largest share of the vote, the theorist is unable to predict the candidate's resting positions and whether or not they will be at an equilibrium.

2 Although it is possible to produce convergent equilibrium positions with an assumption that the utility functions are concave (see Riker and Ordeshook, 1973, p. 343), convergent equilibria are usually produced by quadratic or quasi-quadratic functions.

3 Page (1978) examined candidates' speeches and position papers and concluded candidates take consistent unchanging policy stands in an election campaign. In 1968, Nixon and
Humphrey took inconsistent positions or changed their positions on only 7% of the issues (p. 113). The one instance when a candidate is likely to change his positions occurs when a more radical candidate seeks to adopt more moderate positions. Neither McGovern nor Goldwater (who moderated their positions) changed their positions so drastically as to move past an opponent's position.

It should be noted that each unscaled unweighted issue distance variable was examined individually. Admittedly, this is a tedious way to analyze the data. While it might have been desirable to examine the weighted scaled data in an electoral space, two problems made such an analysis difficult. First, thermometer scores were not readily available for analysis with the scaled voter positions because of data management problems. Second, even with the use of unscaled weighted data the analysis would have been messy because 1) the analysis still would have proceeded one issue at a time and 2) the fact that weighted distances are continuous data would have required arbitrary decisions about the best way to divide voters into groups so the mean candidate support levels of the various groups could have been compared.
CHAPTER 7
CONCLUSIONS

The purpose of this research was to assess the usefulness of electoral competition theory (ect). Critics of ect have complained its predictions do not occur because they depend on unrealistic conditions specified in the assumptions. If the critics are correct, of course, the theory would be of little value in explaining behavior, but some of the evidence in this analysis supports ect. This chapter contains a discussion of the key results and their implications. Future research questions and strategies will also be discussed.

RESULTS

Electoral competition theory makes two predictions: 1) citizens choose the candidate whose issue positions are most similar to their own and 2) candidates will select issue positions that will place them at convergent equilibrium positions. These predictions are both based on ect's core assumption that individuals act to minimize their utility. The prediction pertaining to voters' behavior is based on the auxiliary assumption

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that voters engage in issue voting. In essence, the assumption and prediction about citizens' voting behavior amounts to little more than the claim that citizens vote on the basis of issues. The assumptions and predictions pertaining to candidates' issue strategies are more complex and have implications not only for the candidates' ability to win office but the kinds of policy choices that are made in elections. The assumptions require that the distribution of voters and their utility function be very consistent with the theory's requirements. Survey data and scaling techniques were used to determine how realistic ect's assumptions and predictions are.

The Individual's Voting Decision

Critics point to evidence of projection and persuasion as an indication that the issue voting assumption is unrealistic. However, there is not only evidence that projection and persuasion are present (Markus and Converse, 1979; Page and Jones, 1979) but that they probably occur simultaneously with issue voting (Brody and Page, 1973).

One way to check for the presence of issue voting is to determine if candidates are organized along issue dimensions in the electoral spaces. Contrary to ect's requirement, the underlying structure of the spaces is candidate polarization in which all of one candidate's positions are close to each other and far across the space from the other candidate's
positions. This intracandidate similarity on the issues suggests that each candidate is marked by some basic characteristic which influences how all his positions are perceived. While the candidate polarization in the spaces is most obvious, there is also an issue interpretation of each space.

Although the placement of the candidates' positions in the space is marked by more candidate polarization than ect would suggest, the predictive accuracy of the spaces is reasonably good. In 1972, 83% of the voters chose the closer candidate (i.e., the candidate with the more similar issue positions), 11% chose Nixon even though they were closer to McGovern and 5% chose McGovern when they were closer to Nixon. This respectable rate of prediction is not matched by the 1976 findings. In the Ford-Carter race, only 72% of the respondents chose the closer candidate. Within the remaining 28% of the sample, Carter "incorrectly" received 18% of the total vote and Ford "incorrectly" received 10%. The 72% and 83% rates indicate that voter-candidate issue proximity is an important predictor of the voting decision but it is not the only determinant.

Since the electoral spaces are characterized by candidate polarization it is questionable whether the analysis supports ect. While the electoral spaces do predict vote accurately, they do not indicate that the pure issue voting which is required by ect is occurring. It has been argued that the spaces
are characterized by informed rationalization and uninformed rationalization rather than pure issue voting. Informed rationalization occurs when voters evaluate candidates on the basis of issues and such nonissue criteria such as competence, leadership ability, experience, etc. When the candidates fail to make their issue positions known, uninformed rationalization takes place as the voter is forced to rely on nonissue criteria. These types of rationalization are partially consistent with ectl. To increase the congruence between the data and the theory, it is argued that the effects of nonissue candidate evaluation should be incorporated into the theory. These nonissue criteria (i.e., candidate competence variables) are consistent with the theory's core assumption of utility maximization. With the addition of the candidate competence variables and the specification that informed and uninformed rationalization occur as voters select a candidate, the discrepancies between the assumptions and data are minimized. Although it is possible to interpret the results as supporting some other theory, the consistency between ectl and the data is great enough to determine what effect the competence variables have on voters evaluations of the candidates and whether candidates take convergent equilibrium positions. The more these later results support ectl, the more unlikely it is that the analysis is supporting another theory.
There is evidence from a variety of sources that candidate competence variables are an important determinant of electoral choice. Fortunately, candidate competence is compatible with utility maximization since competence is an attribute which voters might be expected to receive utility from.

The strategy used to test the modified version of ECT was to increase or decrease issue proximity according to how competent the candidate was perceived to be. A voter might expect more utility from a competent candidate than an incompetent candidate even if the candidates had the same issue positions. The weighted issue spaces were produced and compared to the first set of unweighted spaces.

The use of the candidate evaluation weights increased the correct prediction rate, but the amount of the increase varies for the two elections. In 1972 the rate increased 4% (to 87%) and in 1976 it increased almost 13% (to 85%). It is possible that the rate of increase varies with the amount of projection and persuasion effects already present in the issue variables (i.e., the more projection or persuasion effects the less the influence of the candidate competence variables).

In addition to the increase in the prediction rate, the weights also affected the location of the voters and candidates in the space. Strangely enough, these effects varied by the candidate and the election. In 1972, the weights had little effect on the number and relative position of the voters'
concentrations. The weights did change the space, though, by pushing Nixon closer to his supporters and pushing McGovern farther from his. The dynamics of the weights is quite different in 1976. The most obvious effect of the weights is to break up and scatter the large centrally located voter concentration into six smaller concentrations. The candidate competence criterion both increases the theory's ability to predict and modifies the issue voting assumption to bring it more in line with reality.

The Candidates' Issue Strategies

The focus will now turn to the assumptions and predictions related to the candidates' choice of issue strategies. There is, at best, only partial congruence between the equilibrium assumptions and the data. As indicated in the last chapter, this partial congruence would, by most formal theorists' standards, be an indication that the assumptions did not hold and, therefore, the predicted behavior should not be expected to occur. It was suggested, however, that incongruence between the data and assumptions may coincide with predicted behavior. This anomalous event may occur because 1) there is error in the survey data, 2) there are other assumptions which produced the equilibrium or 3) electoral competition theory is robust enough that predictions will occur even though there is only partial congruence. On the basis of this exploratory research
it is impossible to know whether the amount of congruence found is great enough so that the equilibrium will occur.

Candidates' actual positions in the weighted space did not converge to an equilibrium. The candidates could have found a convergent equilibrium if they had located themselves at the voters' median position (this is the potential equilibrium position discussed in chapter 6). How should these findings be interpreted? There are several explanations which can be given. First, if you conclude that assumption-data congruence is insufficient for predictions to hold, you might also conclude that the assumptions discussed in chapter 6 are sufficient but not necessary for an equilibrium. It is possible that some set of assumptions which have not been defined is congruent with the data and this explains why potential equilibrium positions exist. Second, if you conclude the assumption-data congruence is great enough for the predictions to hold, ect was partially correct in its predictions. Considering the inconsistency which does exist, it is impressive to be able to locate a potential equilibrium.

IMPLICATIONS

Now that the analysis has been summarized, the implications of the results for ect and future research can be discussed. First, the value of the candidate competence variables is
considered. Second, the importance of the choice of variables and statistical techniques is emphasized. Third, the robustness of the assumptions and the ability of ects to predict is examined. Fourth, the role of voters with extreme political views is discussed. And finally, the implications of convergent equilibrium solutions for democratic theory are considered.

The Importance of Candidate Competence Evaluation

The candidate competence criterion should be incorporated into ects. This analysis provides evidence that voters evaluate the candidate's competence. The use of the candidate competence criterion is justified because the weights improve prediction rates and facilitate equilibrium. The weights improved predicted voting choice by 4 to 12%. While this alone is an accomplishment, they also make the distribution of voters in the space more symmetric and this in turn makes it possible to find potential equilibrium positions. Fortunately, the idea that voters receive utility from a competent candidate is compatible with ects's core axiom.

Although the candidate weights make the data more congruent with the predictions of the theory, it is not clear how they work. They improve predictions and facilitate potential equilibrium in both the 1972 and 1976 elections and yet their effect is quite distinct in each election. In 1972 the weights pushed Nixon and his group of supporters closer together and
drew McGovern and his supporters apart. This might be explained if Nixon's evaluations were predominately positive and McGovern's were predominately negative. In 1976 the weights had the effect of breaking up one large concentration of respondents and scattering them in six smaller groups in the space. Possibly the voters had different reactions to each candidate and these diverse evaluations caused each candidate's supporters to be pushed in different directions. While this may be the case, it does not explain why voters' evaluations were much more uniform in 1972 and less uniform in 1976. The effect of candidate competence variables needs to be examined before it is possible to advise a candidate how to project an image of competence which will place him at an equilibrium position. Further analysis of candidate competence is, however, beyond the scope of this project.

The Importance of the Choice of Variables and Techniques

The choice of variables and statistical techniques is important. While a variety of variables and techniques can be used to produce electoral spaces, few spaces serve well as a test of effect. To properly test the theory it is necessary to measure the criteria on which a candidate is judged. The usefulness of issues and competence variables in this analysis is an indication that these are relevant criteria. They were operationalized to reflect the utility the voter received from
the candidate. Use of nonmetric multidimensional scaling techniques (MDS and Nonmetric Scoring) which placed voters and candidates in an electoral space with the appropriate number of dimensions.

The scaling analysis in the dissertation was reasonably successful at producing the desired type of electoral spaces. Since it was possible to select from the variables and techniques which had already been used, it was possible to make progress in the attempt to test ect. The availability of Rabinowitz's rank ordering and scaling programs was an important resource. The equilibrium analysis, on the other hand, was more exploratory and there was no readily available techniques to determine whether and where equilibrium positions exist. Since results of the equilibrium analysis are provocative and there were substantial problems in trying to determine if an equilibrium existed, a better technique should be devised.

Prediction and the Robustness of the Assumptions

Electoral competition theory makes strong assumptions about voters' knowledge and issue preferences. When the assumptions hold, the theory predicts that voters choose the candidate who is closest to them on the issues and candidates locate at convergent equilibrium positions. The analysis indicated that voters do have a tendency to choose the closest candidate even though there is not perfect congruence between
the assumptions in chapter 4 and the data. The equilibrium analysis, on the other hand, indicates that while potential convergent equilibrium exists in the weighted spaces, the candidates do not locate at these positions. Again there is substantial disparity between several of the equilibrium assumptions and the data. This disparity is serious since theorists have suggested there should be complete congruence between the equilibrium assumptions and the data. It is difficult to know whether to attribute the existence of the potential equilibrium positions to what assumption-data congruence there is or to explain the failure of the candidates to take convergent equilibrium as an example of the failure of the predictions to hold when the assumptions do not hold. It is also possible that the candidates may fail to take convergent equilibrium positions because they fear extremists would withdraw campaign assistance. More needs to be understood about extremists before the failure of candidates to reach an equilibrium can be attributed to their actions.

The Issue Extremists

While most voters reported higher candidate thermometer scores and, presumably, greater utility from candidates who were close to them, this is not the whole story. An ideological bias was evident in all voters' responses regardless of how near or far they were from the candidates. While the effect of ideological bias was noticeable for all voters, it was
especially pronounced among extremists. Extremists are the very conservative voters evaluating a conservative candidate and the very liberal voters evaluating a liberal candidate. This group is unusual in that they place themselves far away from the candidate but still report a high thermometer score for the candidate. They do not behave as most theorists predict and they also fail to meet McKelvey's requirements for extremist supporters because they do not appear to receive higher levels of utility than voters close to the candidates. This means the extremists' behavior is not explained by the traditional assumptions but it does not differ from traditional assumptions enough to meet McKelvey's requirements. It is possible that, as theorists have suggested, extremists prevent candidates from moving toward the center (Page, 1978) by withholding their campaign support, financial contributions, votes, etc. This analysis does not indicate whether the extremists play this role. Before their role is understood, it will be necessary to learn more about the extremists. Are they more politically active than other voters? Are they more or less likely to have partisan ties? Are they any more or less politically informed than other voters?

A number of questions pertaining to extremists could be pursued using existing survey data. Although this should be done, there are two reasons to doubt that further analysis of existing data will provide an adequate answer. First, given
the small number of extremists, it is unlikely they will exert much influence in a general election. They may, however, be more influential in primaries and caucuses since they comprise a larger proportion of the participants at this stage and issues are more important during the pre-convention stage (Kessel, 1977). Forthcoming CPS presidential primary data will provide a means to study these questions. Second, the extremists in 1972 appear to receive greater utility than the extremists in 1976. It may be that since 1976 is a less unusual election than 1972 and since the extremist effect is less obvious in 1976, the extremists' behavior may not provide an explanation for most elections.

Unfortunately, at present these comments are highly speculative. More analysis of the effect of ideological bias and extremists' effects on the candidates is necessary. It seems likely that the different seasons of the election process and candidates' different personalities and issues positions will interact so that the effect of extremists will vary according to the individual elections.

Convergent Equilibrium Solutions and Democratic Party

Although a convergent equilibrium solution sounds innocuous enough, it has one unpleasant consequence which is seldom discussed. When candidates rest at a convergent equilibrium (i.e., at positions which are at the electorate's median policy
preference), their issue positions are indistinguishable and the voters cannot make a choice between competing issue alternatives. Electoral competition theorists argue that it matters little if candidates do not offer alternatives because both candidates adopt the issue positions preferred by the electorate; in fact, the electoral fate of the competing candidates is unimportant since both candidates would adopt the same policy if they won.

When electoral politics is conceptualized in this way, political competition becomes little more than the struggle to locate the median voter preference. By definition it is unimportant to provide citizens with the opportunity to follow a campaign debate on issues and to make a choice on competing alternatives. According to ect the candidates should struggle to learn what the voters' issue positions are rather than struggle to refine and improve their issue programs in order to compete for voters.

Of course, a rebuttal to this criticism of ect can be made by arguing that competing issue alternatives may be desirable but do not exist in the everyday course of electoral politics. Since competing policy programs are seldom offered, a positive theory such as ect should not be criticized because it recognizes this reality.

In this analysis it is argued that ect does have a normative element. Although theorists sometimes deny this is the case, Page (1978) explicitly acknowledges this normative aspect.
Recognizing that this normative element exists, it is argued that this researcher's preference is for a theory in which candidates compete by offering voters distinct issue alternatives. While it is granted that other positions legitimately exist, it is argued here that candidates perform a service by framing conflicting issue programs and conducting a debate on these issues during the campaign.

The democratic implications of equilibrium solutions are raised in an effort to counteract a seeming overenthusiasm for convergent equilibria. Page is one of the few writing about electoral competition theory to even question the consequences of these equilibria. Most theorists are more intent upon being able to predict the positions that candidates will take than they are concerned with examining the impact of these positions on democratic theory. Of course, the advantages of being able to specify and predict the candidate issue positions cannot be denied and some may think that candidates should seek out issue positions at the voters' median, but it should be recognized that convergent equilibrium positions prohibit candidates from offering competing issue alternatives.

FUTURE RESEARCH PROJECTS

In the course of doing this research several problems and questions have been raised which suggest that improvements
in the research should be made and related research projects could be pursued. Some of the improvements and potential projects will now be discussed. First, the effect of additional variables can be explored. Although it was argued that the effects of party identification are relayed through candidate competence and issue proximity variables, this argument could be tested by including party identification in the analysis. If party identification explained the errors in predicting the vote, its incorporation into the theory could be considered. The omission of party identification would be particularly serious if, for example, Republicans voted for Nixon despite holding issue preferences more closely identified with those of McGovern.

Second, a great deal more analysis of candidate competence needs to be done. At the moment there is a need for variables which directly measure the candidate's ability to provide leadership and administrative ability in the different issue areas. It is hoped that better competence questions will become available and they will reappear in successive election studies. This continuity in question format would enable the researcher to rule out the possibility that changes in the results from one election to the next were due to differences in the candidate competence questions.

Additional work with the competence variables might explain why voters' perceptions of a candidate's competence are so
much more uniform in some years than others (assuming the difference is not the result of differences in the questions). It was suggested that elections in which there is more projection and persuasion are characterized by less uniform evaluations of the candidates and their issue positions. Data should be analyzed to determine whether the suggestion is supported by evidence. There should be an attempt to answer a number of questions. First, when candidates take more distinct issue positions, will voters uniformly perceive candidate competence to be either high (pushing groups of voters closer to the candidate) or low (pushing voters farther from the candidate)? This appears to have occurred in 1972. Will there be elections in which candidates take distinct issue positions and voters have disparate evaluations of the candidate’s competence? Second, do fuzzy issue positions cause voters to have varying perceptions of a candidate’s competence? This appear to be the case in 1976, yet it seems plausible that voters would have uniform evaluations of candidate competence even though they project issue positions onto the candidates.

Another unanswered question is why both the 1972 and 1976 candidate weights produced a more symmetrical distribution of voters even though they affected candidate-voter proximity in a different way in each election. The link between candidate competence and symmetrical voter distributions should be pursued since symmetry is such an essential assumption in ect.
Analysis of additional elections will indicate whether candidate competence variables continue to produce symmetry. If they do, an attempt should be made to determine if this 'symmetry dynamic' occurs because the analysis is based on a more complete set of candidate evaluation criteria. One way to test this idea is to add an additional criterion such as party identification which is thought to influence the utility voters receive from candidates. If party identification were incorporated into the theory and analysis, its effect could be monitored for signs of increased symmetry.

So far the discussion has suggested that there is a theoretical explanation for the ability of candidate competence weights to increase symmetry. It is also possible that the addition of a second variable such as candidate competence simply serves to offset data error which results from depending on one type of variable (issue distance variables). Therefore, it is possible that there is a methodological explanation for the 'symmetry dynamic.'

This discussion indicates that there are a number of questions and problems associated with candidate competence variables. Until questions such as these are answered, it will be difficult to give candidates specific advice about the competence image they project to voters.

Third, there is a problem in determining whether the congruence between the equilibrium assumptions and data is
great enough so that the predictions should hold. It has been argued that complete congruence may be an unprofitable requirement and that some level of congruence short of complete consistency should be explored as a benchmark. The matter will be difficult to pursue since the normal research strategy of comparing the theory's predictions to the results obtained from data analysis will not be sufficient. An alternative strategy might be to artificially create different sets of candidate positions and voter preferences that are incongruent (to a specified degree) with the basic equilibrium assumptions such as radial symmetry. The different sets of candidate issue positions and voters' preferences could then be scaled to determine if the candidates ever take equilibrium positions when assumptions and data are only partially congruent.

Finally, one of the more intriguing and less completely developed aspects of ect is the role that issue extremists play. It is possible that even if 1) the data and equilibrium assumptions were completely congruent and 2) potential equilibrium positions existed, candidates would not locate at a convergent equilibrium. If, as some have suggested, activists have extreme issue preferences and threaten to withdraw important electoral support, candidates may not converge. The most promising avenue to explore is the forthcoming 1980 CPS primary data. It is in the primaries that extremists are most likely to form a large proportion of the electorate. The
data could be analyzed to determine if activists do have extreme issue preferences and whether they do influence the issue positions of the candidates running in the primary.

CONCLUSION

This research has modified ect by incorporating the effects of candidate evaluation into the theory. The modification of ect to include candidate evaluation serves to incorporate a well established determinant of the vote in the theory and this, in turn, makes the theory more consistent with reality. Despite the problems which exist with the operationalization of the candidate competence variables, the inclusion of the variables has increased the predictive accuracy of the theory and produced spaces in which candidates could, if they chose, place themselves at a convergent equilibrium by locating at the voters' median issue position.

This research has also proposed and used a different combination of variables and statistics to provide a test of ect which improves upon existing research. In this analysis the voters and candidates are placed in the electoral spaces according to their relative proximity on specific issues. This produces spaces with an essential characteristic for testing ect: central locations are, by definition, near the voters' median issue position. In some of the earlier studies a central
location indicated that the candidate did not belong on either side of a basic political cleavage which separated other candidates. Although the earlier spaces predicted the voters' choice of candidates, they did not serve to test predictions of convergent equilibrium.

Finally, the analysis provides a test of the predictions pertaining to the voters' choice of candidates and the candidates' strategies in competing for votes. The theory predicts well (87% correct predictions) when the voters' evaluations of both candidate competence and issues are included. As it now stands the evidence indicates candidates do not converge to an equilibrium solution. This finding is consistent with the intuitive political perception that candidates do offer some choices (within certain prescribed political boundaries) to voters. When further elections have been examined to determine whether candidates ever converge and what influence, if any, extremists have on the candidate's issue positions, a more definitive explanation of candidate behavior can be provided. Until then, the failure of candidates to converge remains a comfort to those who feel the candidates should offer the citizens at least some issue choices.
APPENDIX A

ISSUE SALIENCE

Although issue salience was determined primarily by the responses given to the question which asked about the most important problems facing the nation, an additional salience measure was examined. The alternative saliency variable measured the frequency with which candidates' issue positions are mentioned as things respondents like and dislike about the candidates. The most salient issues in 1972 are listed in Table 31. The two rankings of the issues are similar with the exception of taxes.

The most salient issues in 1976 are listed in Table 32. Since inflation and pollution proximity questions were not available, and could not be included in the analysis, they are not included in Table 32.

To ensure that excluding less salient issues (such as abortion, women's rights, rights of the accused and aid to minorities) did not influence the results of the spatial analysis, a space was produced using all 9 proximity questions available in the 1976 data. The results of the analysis were very similar to results produced with only 5 issues. In general, the less
salient issues were not very important in defining the dimensions.

Table 31
Different Measures of Issue Salience in 1972

<table>
<thead>
<tr>
<th>Most Important Problem Facing the Nation</th>
<th>Candidate Likes and Dislikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank Order</td>
<td>%&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1</td>
</tr>
<tr>
<td>Inflation</td>
<td>2</td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>3</td>
</tr>
<tr>
<td>Marijuana</td>
<td>4</td>
</tr>
<tr>
<td>Busing</td>
<td>5</td>
</tr>
<tr>
<td>Taxes</td>
<td>6</td>
</tr>
<tr>
<td>Health</td>
<td>7</td>
</tr>
</tbody>
</table>

<sup>a</sup>percent of people who mentioned this issue as the most important problem

<sup>b</sup>of the 633 people who mentioned an issue, percent of the people who mentioned this issue
Table 32
Different Measures of Issue Salience in 1976

<table>
<thead>
<tr>
<th>Most Important Problem Facing the Nation</th>
<th>Candidate Likes and Dislikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank</td>
<td>%(^a)</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>Government Guaranteed Standard of Living</td>
<td>1</td>
</tr>
<tr>
<td>Taxes</td>
<td>2</td>
</tr>
<tr>
<td>Busing</td>
<td>3</td>
</tr>
<tr>
<td>Health</td>
<td>4</td>
</tr>
<tr>
<td>Marijuana</td>
<td>5.5</td>
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<tr>
<td>Crime</td>
<td>5.5</td>
</tr>
<tr>
<td>Abortion</td>
<td>-</td>
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</tbody>
</table>

\(^a\) percent of people who mentioned this issue as the most important problem

\(^b\) of the 668 people who mentioned an issue, percent who mentioned this specific issue
## APPENDIX B

**CANDIDATE POSITION COORDINATES**

List of Coordinates for the Median, Actual Candidate Positions and Potential Candidate Positions

<table>
<thead>
<tr>
<th></th>
<th>Unweighted Data</th>
<th>Weighted Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dim 1</td>
<td>Dim 2</td>
<td>Dim 1</td>
</tr>
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<td><strong>Median</strong></td>
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<tr>
<td><strong>Actual Position</strong></td>
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<tr>
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<tr>
<td>McGovern</td>
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<tr>
<td><strong>Potential Positions</strong></td>
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<td></td>
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### 1976 Unweighted Data

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<thead>
<tr>
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<tbody>
<tr>
<td>Median</td>
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**Actual Position**

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<tbody>
<tr>
<td>Ford</td>
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<tr>
<td>Carter</td>
<td>0.76</td>
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**Potential Positions**

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<table>
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<tr>
<td>Ford's Cm</td>
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<tr>
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### 1976 Weighted Data

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**Actual Position**

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<tbody>
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<tr>
<td>Carter</td>
<td>0.91</td>
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**Potential Positions**

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<table>
<thead>
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<tbody>
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<td>Carter's L</td>
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<td>-------</td>
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<tr>
<td><strong>Carter's O</strong></td>
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LIST OF REFERENCES


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