The dialogue over the utility of the behavioral approach in political science has been resumed in a number of important publications within the last two years (Charlesworth, 1962, Dahl, 1961; Eulau, 1963; Ranney, 1962; and Storing, 1962). Although the behavioral approach was originally considered a protest against the procedures of traditional political science (Dahl, 1961, p.766; Kirkpatrick, 1962, pp. 10-11), the protests in the recent literature have been raised mainly against the methodology of the behavioral approach. To those who understand and appreciate behavioralism in political science, the faith has been admirably represented and defended by the behavioralist spokesmen, and any reasonable man ought to admit the wisdom in their arguments. But arguments which seem clear and conclusive to behavioralists may fail to impress their critics. Perhaps what is needed is less defense of the behavioral approach and more evidence of its accomplishments; less faith and more good works. The appropriateness of any approach to study is unlikely to be challenged if its utility is clearly established. But unfortunately, as Nelson Polsby, Robert Dentler, and Paul Smith have remarked, the advocates of the scientific study of politics have been "long on promises and short on payoff" (1963, p.1).

There is an indication that advocates of the behavioral approach are showing a more positive attitude in stating the case for their methodology. Polsby, Dentler, and Smith, for example, have compiled a book of readings with the avowed purpose of showing off the accomplishments of the behavioral approach. This essay is also intended to reflect a positive attitude in answering one of the major questions asked of the behavioralists. As the title suggests, I shall try to show how specific methodological innovations in behavioral research have produced definite substantive advances in our knowledge about political phenomena. But because this essay is directed at only one of the points at issue between the behavioralists and their critics, I first want to fit my remarks into the context of that dialogue.

The Role of Methodology in Political Behavioralism

The recent publications cited above reveal little consensus concerning the exact definition of "political behavior" or the "behavioral approach" in political science. To some extent, the disagreement over definition depends on the writers' sympathies toward the thing being defined. The "skeptics"--defined herein as those inclined to be critical of the current emphasis on empirical research in political science--are apt to equate the behavioral approach with the discredited "behaviorism" in early psychology (Kirk, 1962) while displaying considerable variance in their interpretations of the nature of behavioral research (Sibley, 1962, p. 69). The "behaviorists"--defined herein as those inclined to look favorably on empirical research--unite in denying the equality between psychological behaviorism and the behavioral
approach (Easton, 1962; Eulau, 1962) and in general reveal more agreement over the essential characteristics of behavioralism in political science.

Behavioralists may differ as to whether or not a definition of the behavioral approach ought to emphasize the study of individuals rather than institutions (Dahl, 1961, pp. 766-767), or whether the concern for developments in other social sciences ought to be incorporated into the definition, but these differences are of minor importance. Most behavioralists are likely to agree that their approach to study is distinguished by these features: (1) a concern for questions that can be answered with empirical data, (2) an involvement in constructing and testing theory about empirical phenomena, and (3) an interest in the development and proper application of methodological techniques in empirical research (Kirkpatrick, 1962, p. 12; Eulau, 1963, p. 14-35; Eldersveld et al., 1956, p. 65; Ulmer, 1961, pp. 2-4; Easton, 1962, pp. 7-8; Dahl, 1961, pp. 767-768).

An examination of the literature critical of the behavioral approach shows that these three distinguishing characteristics have, to varying degrees, drawn fire from the skeptics. They have steadily criticized the behavioralists' preoccupation with questions that can be answered with empirical data. Writing as an observer of the contemporary political science scene, Charles Hyneman notes that those worried about the current emphasis on the scientific study of politics fear "that an increase in attachment to scientific endeavor will be accompanied by elimination of significant questions from the profession's area of concern" (1959, p. 153). Mulford Sibley, a prominent critic of behavioralism, contends that, because of this regard for questions that can be answered with empirical data, there are definite limits to what the behavioralists can tell us. They cannot, he points out, tell us what we ought to value as ultimate ends in political life (1962, p. 82). The preoccupation with empirical questions is clearly identified as one of the characteristics, and faults, of the behavioral approach in the writings of the skeptics (see Kirk, 1962, for a discussion of "Segments of Political Science Not Amenable to Behavioristic Treatment").

The role of theory in behavioral research, however, has drawn mixed reviews from the skeptics. Some, like Russell Kirk, claim that behavioralists operate under the "theory that theory is irrelevant" (1962, p. 51). But others, like Mulford Sibley, recognize that behavioralism "stresses both scientific theory and a verification process testable by reference to behavior" (1962, p. 69). Frank Finner describes the paradox:

The new breed of political scientists is fond of accusing the old-liners of insufficient sophistication in "theory," while the old-liners accuse the "behavioralists" of a seemingly similar crime: that of neglecting significant theoretical questions for the sake of empiricism and of neatness in research technology (1960, p. 184).

The confusion, of course, lies in different meanings of "theory." Suffice it to say that the behavioralists are speaking of that type of theory which has been variously called "scientific," "empirical," "descriptive," or "causal" as opposed to "philosophical," "normative," "prescriptive," or "value" (Van Dyke, 1960, pp. 88-109; Easton, 1953, pp. 52-55; Jenkin, 1955, pp. 8-9).

The skeptics have also directed a large part, if not most, of their criticism upon the behavioralists' involvement in questions of methodology and research technology. Walter Berns' remarks in his review of the current voting literature probably express their basic attitude toward the role of methodology in behavioral research. Berns charges, "The result is the sacrifice of political relevance on the altar of methodology. The questions asked and pursued are determined by the limits of the scientific method rather than by the subject matter . . . " (1962, p. 55).
This essay will not seek to defend the behavioralists' concern with "is" rather than "ought" questions, nor will it attempt to demonstrate the importance of theory in empirical research. Instead, it will be concerned with emphasizing the importance of methodology in behavioral research, with elaborating upon the criticism directed at behavioral studies which utilize special research techniques, and with showing through examples that much of this criticism is either misguided or misinformed.

Although it must be clearly understood that the behavioral approach involves more than just methodological concerns (Kirkpatrick, 1962, pp. 22-24; Easton, 1962, pp. 9-12), questions of methodology and research technology occupy a prominent place in the study of political behavior. In the opening pages to his INTRODUCTORY READINGS IN POLITICAL BEHAVIOR, Sidney Ulmer stresses "the value of developing and utilizing more precise techniques for observing, classifying, and measuring data" (1961, p.3). The interest in the technology of empirical research was stimulated by the substantive progress due to the "technological revolution" in the other behavioral sciences (Truman, 1961, p. 12; Eulau, 1962, pp.38-39). Practicing behavioralists now readily grant that "the political behavior orientation implies a major emphasis upon systematic research and upon empirical method" (Eldersveld et al., 1956, p. 66); that "the behavioral persuasion tries to develop rigorous research designs and to apply precise methods of analysis to political behavior problems" (Eulau, 1963, p. 34). The association between methodology and the behavioral approach is so close that Pinner has observed:

"methodology" currently has a partisan ring among political scientists. A rather heterogeneous congregation of innovators--inappropriately lumped under the single appellation "behaviorism"--has for some time been agitating for more refinement and discrimination in the discipline's intellectual procedures and research technologies. Indeed, this concern with method is perhaps the only interest common to all "behaviorists" (1960, p. 183).

The saliency of methodological concerns in empirical research has attracted much criticism from those skeptical of the behavioral approach. Easton observes:

These critics have accused students of political behavior of selecting their problems not in the light of theoretical or ethical relevance but largely on grounds of the accidental availability of technically adequate means for research. If a reliable technique is not at hand, the subject is not considered researchable. As a result of the admittedly early stages in the development of technical means of social research, the argument runs, the behavioral approach is able to deliver reliable knowledge only with regard to political commonplaces or trivia (1962, p. 11).

This attitude toward the substantive product of behavioral methodology is seen in Berns' evaluation of THE VOTER DECIDES, one of the landmark studies in the voting literature, which, he says, "goes to elaborate lengths to establish the obvious" (1962, p. 13). Writing in the same volume of essays critical of the behavioral approach, Leo Strauss expands on this point and applies it to the behavioral literature in general:

"Generally speaking, one may wonder whether the new political science has brought to light anything of political importance which intelligent political practitioners with a deep knowledge of history, say, intelligent and educated journalists, to say nothing of the old political science at its best, did not know at least as well beforehand (1962, p. 312).

The other essays in that volume convey the same attitude toward the product of the behavioral approach. The lengthy review of those essays by John Schaar and Sheldon Wolin identifies that attitude with the first of five major points they abstracted from the book, and they restate the point so: "The new political science has not yielded any new knowledge. Its findings have been largely trivial and where they
Despite their considerable disagreement with many other aspects of the Schaar and Wolin review, the authors of the ESSAYS would probably consider that a fair statement of one of their major points (but see Storing et al., 1963).

Expositors of the behavioralist position have not ignored the charge that they have disclosed trivialities or have documented the obvious. But the behavioralists contend that they have made significant contributions to knowledge through the use of various methodological innovations. Evron Kirkpatrick argues:

The development of the new tools and techniques itself had consequences; subjects previously accessible only to speculation and conjecture were made accessible to systematic investigation. The accumulation of new data led to the development of additional techniques, new methods of analysis, and new theory. Attitudes, feelings, perceptions, values, and motivations of individuals, for example, had long been traditional subjects of speculation. The development of the new science of statistics and of the sample survey, for the first time, affords the opportunity to take such matters out of the realm of speculation and make them accessible to investigation through scientific sampling and judicious interviewing. In the same fashion psychoanalytic techniques, content analysis, and other methods of research have made objective analysis possible where only subjective impressions could be obtained before (1962, pp. 23-24).

Eulau also believes that "the contributions that behavioral research has made to political knowledge are impressive." Reviewing the developments in the discipline since the end of World War II, he finds "substantial advances in almost all the traditional areas of political science" (1963, p. 110).

These broad statements backed up by general references to the relevant literature may be meaningful and conclusive for those who know the behavioral literature and understand the research methodology, but they are unlikely to convince the uninitiated. Unfortunately few defenders of the behavioral methodology have documented their contentions except by directing the reader to the behavioral literature or by referring to specific subjects within political science which have been studied with the new techniques. The articles by Robert Dahl (1961) and Glendon Schubert (1963) have perhaps been the most detailed in documenting advances in our knowledge due to behavioral research, but Dahl's treatment is quite brief and Schubert's is concerned only with the field of public law. In this essay, I will try to deal more comprehensively with specific methodological innovations and some contributions to knowledge they have produced.

Methodological Innovations in Empirical Research

The focus of the 1963 meetings is on the developments in political science since 1933. That year will serve as a reference for deciding what constitutes an innovation in political science methodology. A survey of the literature on research methodology before this date discloses some of the opening lines in the debate over the feasibility and productivity of rigorous empirical research in political science (Dewey, 1923; Fairlie, 1927; Allport, 1927; Catlin, 1927 and 1931; Rice, 1928; Elliott, 1931; and Lasswell, 1931). Except for some unfamiliar phraseology, the partisan arguments of that day are amazingly similar to those found in recent essays on the utility of the behavioral study of politics. The contemporary dialogue, however, is sharpened somewhat by its use of the words, "the behavioral approach." This term does not appear with regularity in the polemics of the period, although stages in its evolution can be seen in early statements about the "newcomer among the subjects claiming the curiosity and interest of students of political science,"
"which might be referred to, for want of a better title, as public opinion and behavior in governance . . ." (Beyle, 1931, p. 174).

Those skeptical of empirical research in political science asked the same question then as now: "What new knowledge has been produced through this new means of study?" George Catlin wrote during that period:

The great objection to a political science in the mind of the ordinary man is that the subject pompously so named has hitherto conspicuously failed to "make good"; it has made a great display of packing for the journey but has never as yet been known to arrive at a destination beyond the everyday knowledge of any layman (1927, p. 147).

Along with other "behavioralists" of his era, Catlin urged the critics to be patient. Much groundwork had to be done, and new methods had to be devised for the job. Herman Beyle estimated that "it will probably require all of the century to develop the procedures of research that can provide a body of knowledge that may be relied upon with any great confidence for the larger projects of social engineering that are admittedly needed" (1931, p. 206).

What research procedures were in use before 1933? Despite Beyle's statement that "the writing on the methodology of political science has of late nearly deluged the student of politics" (1931, p. 1), a survey of the literature reveals few concrete examples of special methodological techniques used in political science research. Dorothy Campbell Culver's METHODOLOGY OF SOCIAL SCIENCE RESEARCH: A BIBLIOGRAPHY (1936) classified entries, among other ways, according to ten special fields within the social sciences. Included as special field were "Education" and "Rural Sociology" but not "Political Science." There was, however, a classification for "Politics and Law." Twenty-one publications were listed under this heading, compared to fifty-four under "Sociology," and twelve of the twenty-one dealt with "Law," leaving only nine bibliography entries for "Politics." Furthermore, most of the publications cited were writings on methodology in general rather than about the applications of concrete techniques to empirical research. According to this survey, it appears that very few shots had been fired before 1933 in the "technological revolution" in political science.

The impression of methodological poverty conveyed by Culver's bibliography is undoubtedly an accurate picture of the state of affairs at that time. Nevertheless, some pioneering works utilizing research techniques which have since become valuable tools of modern empirical research can be found in the pre-1933 literature. Some of the more prominent examples of early experiments with methodological techniques which are now established tools of research are given below.

<table>
<thead>
<tr>
<th>Research Technique</th>
<th>Researcher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll call analysis</td>
<td>Lowell</td>
<td>1902</td>
</tr>
<tr>
<td>Correlational analysis</td>
<td>Ogburn and Goltra</td>
<td>1919</td>
</tr>
<tr>
<td>Mail-out questionnaire</td>
<td>Merriam and Gosnell</td>
<td>1924</td>
</tr>
<tr>
<td>Field interviewing</td>
<td>Merriam and Gosnell</td>
<td>1924</td>
</tr>
<tr>
<td>Punch card data processing</td>
<td>Merriam and Gosnell</td>
<td>1924</td>
</tr>
<tr>
<td>Controlled experiment</td>
<td>Gosnell</td>
<td>1927</td>
</tr>
<tr>
<td>Content analysis</td>
<td>Lasswell</td>
<td>1927</td>
</tr>
<tr>
<td>Panel interviewing</td>
<td>Rice</td>
<td>1928</td>
</tr>
<tr>
<td>Analysis of voting cohesion</td>
<td>Rice</td>
<td>1928</td>
</tr>
<tr>
<td>Cluster-bloc analysis</td>
<td>Beyle</td>
<td>1931</td>
</tr>
<tr>
<td>Attitude scaling</td>
<td>Beyle</td>
<td>1932</td>
</tr>
<tr>
<td>Sample survey</td>
<td>Robinson</td>
<td>1932</td>
</tr>
</tbody>
</table>
Although these techniques had been introduced before 1933, they were certainly not established methods of inquiry by that time. The examples cited were largely unique in the literature, and the methods employed were still under development. The techniques were not widely taught and not often employed by other researchers.

The behavioralists of the time were acutely aware of their lack of tools for the empirical research to which they were committed (Fairlie, 1927, pp. 295-297; Rice, 1928, p. 4). A searching review of the data and method of political science was contained in the lengthy final chapter of Beyle's IDENTIFICATION AND ANALYSIS OF ATTRIBUTE-CLUSTER-BLOCKS (1931). In that chapter, Beyle stressed the importance of developing new research tools for the study of politics, arguing, "The political scientist should welcome the contribution of such techniques of observation and description coming from all quarters" (p. 197). He later indicated some of the methodological needs of political scientists:

The need really is for patient detailed gathering of data on a microscopic scale, one on which the observer can actually see and note specific things and actions, sequences, and concurrences. The immediate gains may seem insignificant, but the ultimate possibilities are greater. The need, too, is for increasing development of new techniques which may render observation possible or more precise . . . .

As to the "description of data," the prime need is for the provision of records of observations in explicit terms. Preferably they should be measurements; but failing that, description should yield as explicit denotation as is possible.

. . . There is need, too, of adoption and elaboration by the political scientist of statistical techniques of classification . . . . [and] of developing techniques of estimating the significance of groupings of classified data (pp. 211-212).

Beyle referred to three different needs of political scientists for dealing with empirical data. These needs have still not been completely fulfilled; techniques are still required for collecting, measuring, and analyzing data. Although the modern behavioral arsenal does not yet contain a full range of weapons for dealing with all aspects of these needs, its inventory of standard research techniques is far superior to that available to researchers when Beyle wrote. Because they had not been widely used before that time, all of the research techniques listed above might properly be considered as methodological innovations in behavioral research since 1933.

A number of other methodological techniques first introduced after that date but now standard tools of political science research also qualify as methodological innovations. The list of techniques now available for use in empirical research would include all those mentioned previously plus Guttman scaling, a variety of non-parametric statistical techniques, game theory, factor analysis, and computer simulation.

Several research techniques from the full list will be chosen for the purpose of showing how methodological innovations have contributed to our knowledge of political phenomena. But first, it is appropriate to ask what kinds of contributions to knowledge can be expected from any type of scholarly research.
It would seem that scholarly research can make at least four types of contributions to knowledge. Each of these types may be thought of as being on a different "level" of progress for the state of knowledge on the subject being researched. The distinction among levels of progress is crude at best, but it may help in sorting out the contributions to knowledge made by techniques of empirical research.

1. Identifying relevant variables: At the "first" or "fundamental" level of progress, scholarly research may identify variables that appear to be related to the occurrence of the phenomena under study. In some instances of empirical research, the actual conceptualization of the variable may originate with the researcher. But probably in most instances, the variable is not the conceptual child of the researcher (although he may contribute much to its clarification) but is one whose relevance to political phenomena has already been noted in the traditional literature. The concept may even have been employed in propositional statements, but not necessarily in a form which permitted verification through testing with empirical data. Regardless of whether the concept originates with him or whether it has its roots in the existing literature, the empirical researcher must develop some replicable operations for identifying the existence or strength of the variable in his data. In short, he must "operationalize" the conceptualization to make the variable amenable to empirical study. An example will illustrate the process.

A voter's party preference or his "partisanship" is a concept which has long been regarded as a factor involved in American elections. It has been observed that voters in certain areas continually favor a given party election after election. The evidence indicated that the voters held some kind of loyalty to the established parties but that this sense of loyalty probably varied in intensity among individuals. Voting returns could reveal areas of Democratic or Republican strength, but they could not tell us whether shifts in voting for party candidates at a given election were due to changes in attitudes toward the parties, to the influence of the issues of the day, or to the appeals of the candidates involved in the election. What was needed was a measure of party loyalty which could tell which party was favored how strongly by whom and which could be used at different points of time in different parts of the country.

The authors of THE VOTER DECIDES (1954) operationalized the idea of party identification by first asking individuals this question: "Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?" If the respondent answered either "Republican" or "Democrat," he was then asked, "Would you call yourself a strong (Republican or Democrat) or not a very strong (Republican or Democrat)?" If the respondent initially answered "Independent" or something else, he was asked, "Do you think of yourself as leaning closer to the Republican or Democratic party?" As a result of this questioning, virtually all respondents could be classified on a seven-point scale as follows: (1) Strong Democrat, (2) Weak Democrat, (3) Independent with Democratic leanings, (4) Independent with no partisan leanings, (5) Independent with Republican leanings, (6) Weak Republican, (7) Strong Republican.

This particular operational measure of party identification is probably the most widely used in the voting behavior literature. In numerous studies it has been found to relate clearly and consistently to voting choice as one moves from category to category on the scale. The strong Democrats tend to vote Democratic more often than theWeak Democrats, who tend to vote Democratic more than the Independent Democrats, etc. The identification of this important variable by means of a successful operational measure constitutes a significant substantive advance in the study of American
voting behavior. The significance of this substantive contribution, however, is unlikely to be appreciated by those who are not familiar with the development of the voting literature. Successful efforts to identify relevant variables are really only first steps on the road to developing a reliable body of knowledge, and, regardless of their long-range important to study, are not readily recognized as contributions to knowledge by those outside of the field. For this reason then, the contributions to substantive progress that methodological innovations have made by identifying relevant variables will be largely ignored in this paper. I doubt they would be impressive to those inclined to be critical of behavioralism, and there are other types of contributions with higher face value which might command quicker recognition.

2. Substituting factual knowledge for speculation: Once the relevant variables have been identified, two questions arise. (1) How are the variables distributed throughout the population or within sub-groups of the population? (2) What relationships hold among the variables and other phenomena of interest? The charge that empirical research merely documents the obvious is probably most frequently made with respect to contributions I would place in this category. Unsystematic observations of the variables under study have often furnished us with some ideas of what we are going to find, and research findings frequently prove pre-research speculations to be correct. Consequently, it may appear that empirical research merely documents the obvious. If necessary, at least two things can be said in support of the contention that the substitution of factual knowledge for speculation is a genuine contribution to knowledge, even in some cases where the "obvious" has been documented.

The first is that our speculations are usually quite vague. We may have rather definite notions about the direction of relationships, but not about strength; we may have some rough ideas about relative magnitudes; but not about the specific frequencies with which phenomena occur. Empirical research enables us to replace speculative estimates with concrete findings which are themselves capable of subsequent examination and verification. In addition, what often appears to be obvious—after the finding is revealed—was not really as obvious as hindsight might indicate. In fact, the state of our knowledge is such that contradictory explanations are often available to account for the findings of many studies. A finding that the majority party in a legislative body showed more voting cohesion than the minority party can be readily explained by a combination of common sense and folklore, but so can the opposite finding: that the minority party showed more voting cohesion. Either finding could be given a plausible ex post facto explanation and be regarded as merely documenting the obvious. Dahl remarks:

Twenty-five centuries of dedicated study of politics have naturally produced a good many highly plausible but, unfortunately, contradictory hypotheses, each strongly supported by common sense, that can be argued till Doomsday so long as one sticks to the older method of analysis. Happily, new methods of inquiry or analysis sometimes help us to settle these questions (1963, p. viii).

In view of the risk in presenting findings which might be regarded by some as obvious, my review of substantive contributions of methodological innovations will make only cautious references to research which provides precise knowledge in place of speculation.

3. Correcting factual inaccuracies: Plausible statements about empirical matters supported by casual observations often become established in the literature and regarded as truths. "But," it has been observed, "surprisingly often, generally accepted notions about human behavior and social life are wrong, when they are examined carefully" (Polsby, Dentier, and Smith, 1963, p. 70). Research findings which explode myths are perhaps the most visible, although not necessarily the most
important, contributions to knowledge, and the behavioral literature abounds with contributions of this type. Because research findings in this category are apt to be acknowledged as contributions more readily than those which fall in either of the two preceding categories, I will later emphasize the "myth-exploding" contributions of methodological innovations in empirical research.

4. Explaining macroscopic phenomena previously observed but never fully explained: This seems to me to be the "grandest" type of contribution to knowledge in a given field. Two appropriate analogies in the natural sciences would be Kepler's demonstration that the earth revolved around the sun and Pasteur's disclosure of the role of germs in disease.

The whole of social science research cannot claim many contributions to knowledge of this character, ignoring entirely the question of the significance of the contribution. It should not be surprising to learn that one has to search carefully to find any at all that can be reasonably attributed to methodological innovations in empirical political science research. But behavioral research is in its infancy, and—just as was done for the examples cited above—groundwork for such breakthroughs must first be laid. This point is well made in Eulau's essay on the behavioral approach:

A science of politics which deserves its name must build from the bottom up by asking simple questions that can, in principle, be answered; it cannot be built from the top down by asking questions that, one has reason to suspect, cannot be answered at all, at least not by the methods of science. An empirical discipline is built by the slow, modest, and piecemeal cumulation of relevant theories and data (1963, p. 9).

The findings produced by political science research are just beginning to be structured into a body of knowledge. The building blocks in this structure may frequently seem trivial when viewed alone, but they assume importance when lashed together. We will see that sufficient construction has occurred in certain fields with the use of certain methodological techniques to produce some contributions which qualify as explanations of macroscopic phenomena. In the concluding paragraphs of this essay, I shall argue that the absence of more contributions falling in this category is due mainly to the infancy of behavioral research and the consequent failure as yet (1) to gather data over time within any given political system and (2) to conduct comparative investigations in other political systems.

Contributions of Methodological Innovations

One can easily establish categories for classifying contributions to knowledge, but it is far more difficult to assess the importance of any given contribution. I will not try to make a special case for the significance of any of the findings I present in the rest of the paper. I will merely try in good faith to choose examples which a "reasonable" man would acknowledge to be important, given the cautions expressed in the previous section. Although some of my choices may be open to question by reasonable men, I hope that the bulk of the findings, viewed collectively, will be convincing.

By now it should be apparent that the term "methodology" is being narrowly interpreted in this paper. Although it has broad epistemological connotations within the literature, the term is being used here to refer only to well-defined research techniques. Any attempt to establish the substantive contributions of behavioral methodology (now in the broad sense) which focuses exclusively on innovations in research techniques is certain to understate the case for the behavioral approach by excluding many important contributions from consideration. There are important
substantive advances in knowledge which can properly be credited to behavioral methodology in general but which cannot be attributed to any of the specific methodological techniques to be discussed. The behavioral methodology truly entails a "mood" (Dahl, 1961, p. 766) or a "persuasion" (Eulau, 1963) among its practitioners. The characteristic feature of this attitude reflected throughout all behavioral research is a concern for the empirical. Much solid research and consequent contributions to knowledge have been generated out of this characteristic attitude-mood-persuasion without the use of special methodological techniques beyond counting, classifying, and comparing percentages.

Maurice Klein's "A New Look at the Constituencies: The Need for a Recount and a Reappraisal" (1955) is a good example of a study conducted in the behavioral spirit which employs no special techniques in analyzing neglected empirical data. Klein cites more than twenty prominent political science textbooks which say that state legislators are generally elected from single-member districts: "Multi-member elections, all agree, are atypical" (p. 1105). Klein continues, "No one, apparently, has checked the relevant data in more than half a century." But Klein did, and he discovered that only nine states selected all legislators in single-member districts and that more than 45% of the seats were associated with multi-member districts in elections to lower chambers. He concludes, "The exceptions to the so-called 'rule' are many, not few. They are so many, indeed, that the term 'rule' is inappropriate" (p. 1106). This finding discredits the easy generalization that multi-partisim in American state politics is discouraged by the election of legislators from single-member districts.

Many other examples could be cited of behavioral studies which employ only basic scholarly tools to answer well-defined questions about political phenomena which have gone unanswered in the traditional literature. Only two more such examples will be mentioned. George Rieckert and Wilder Crane examined the 157 roll call votes taken during the 1953-57 period of the West German Bundestag and tested some propositions about factors leading to deviations from party-line voting (1962). They found that the high cohesion of German parliamentary parties cannot be accounted for by the large proportion of civil servants seated in parliament, as had been suggested. After separating the legislators according to occupation, they found the civil servants in the governmental party (the Christian Democratic Union) more likely to deviate from the positions taken by the majority of the party than those who were not employed by the government. In opposition to the suggestions of some German writers, they also found that religious affiliation could not account for party deviations. Members of the Protestant minority within the predominantly Catholic CDU were slightly less likely to deviate from the party position than the Catholic members. Finally they discovered, contrary to many statements in the literature on political parties, that legislators elected from single-member districts were more likely to be party regulars than those selected from state-wide proportional representation lists in accordance with Germany's rather unique electoral system.

The other example is Richard Rose's study of "The Political Ideas of English Party Activists" (1962). The party literature, once again, contains propositions about the extreme ideological views of local party activists or "militants." The militants, it has been argued, impose a steady pressure towards ideological extremism on their party leaders. But Rose's counting and classifying of the resolutions submitted to the annual conferences of the British Conservative and Labour parties indicates that "extremism" is not characteristic of the resolutions passed by local constituency parties and urged on their national leaders. About half of the 4,598 resolutions examined for both parties from 1955 to 1960 Rose considered to be non-partisan in nature, about one-quarter were typically partisan (pointing with pride
and viewing with alarm), and less than one-third were classified as presenting an extreme ideological viewpoint.

Perhaps neither of the latter two studies can be thought of as models of empirical inquiry. Rose's study in particular may raise some broad methodological questions: Would other researchers classify the resolutions in the same manner? Do party resolutions adequately reflect the militants' attitudes? How can we tell if the extremist resolutions affect the leaders' behavior? Such questions continually confront those engaged in behavioral research. Frequently, they can be answered within the framework of the original counting-classifying-percentagizing methodology. But in some instances, the research problem requires the collection of new data, or the development of a new technique for quantifying available data, or the application of a more powerful tool for analyzing the data. Methodological innovations in political science research were developed within the discipline or imported from other disciplines in response to such problems of research.

Each of the methodological techniques mentioned earlier found use by political scientists because it helped in political research. I do not propose, however, to show how all of these techniques have contributed to our knowledge about politics. It is fashionable to say that space limitations prevent me from considering each technique in turn. That is, of course, only partially true. To be both honest and realistic, I must admit the operation of two more important limitations. To be honest, I am not familiar enough with the relevant methodological and substantive literature to deal with all the techniques mentioned. To be realistic, some of the techniques mentioned probably have not yet produced findings which, in view of the cautions mentioned in the preceding section, a reasonable but stubborn critic would agree were significant contributions to knowledge. But I trust that my basic argument—that methodological innovations have contributed to our knowledge of political phenomena—will not be declared invalid simply because my discussion was limited to only a few research techniques. I will consider only substantive contributions which have been produced through the use of the sample survey, scaling techniques, punch card data processing, correlational analysis, and multivariate analysis.

Sample Survey: The sample survey is generally recognized as the most important methodological development in political science research. Truman says that sample survey techniques have been accorded this recognition not only because they constitute a basic instrument of social research in their own right, but also because their refinement has stimulated a series of achievements, primarily in the invention of ancillary techniques but also to some extent in the construction of explanatory theory (1961, p. 12). The importance of the sample survey in the study of political behavior was not immediately apparent to thoughtful political scientists around the time it was developed. W. Y. Elliott, writing in 1931, could not "see any pragmatic results from hypothetical distribution-curves of opinion . . . " (p. 86n). The statement of opinion does not permit the scientific exactitude of self-analysis . . . . The arrangement of opinions will produce mathematically interesting results, but the qualitative significance of such studies by any of the techniques yet produced seems of slight scientific value (p. 86n). Although the sample survey is one of the most administratively complex and expensive of the modern research tools, it has become perhaps the most widely used in current research.

The great advantage of the sample survey is that it joins together actually two separate research techniques: field interviewing and sampling methods. In one sense field interviewing is not a "new" technique, for it simply involves going out
and asking people questions. DeTocqueville's DEMOCRACY IN AMERICA and, better, James Bryce's AMERICAN COMMONWEALTH and his MODERN DEMOCRACIES were based largely on interviews conducted with individuals encountered in their travels, but their interviewing was basically unsystematic. Lasswell's evaluation of Bryce's methodology states, "There is no evidence, however, that Bryce ever systematically classified various types of well-informed people, and exerted himself to discover the variations among them in opinion about a specific issue" (1931, p. 471). Lasswell also finds no evidence that Bryce ever used a fixed list of questions to guide his interviewing. Modern field interviewing of sample survey research employs highly structured schedules of questions, both closed and open-ended, which permits the work of many interviewers to be added together on a comparable basis. By joining field interviewing with sampling methods, survey research can, within known confidence limits, permit generalizations to be made about the universe from which the interviews were drawn.

The sample survey has been especially suited to the study of citizen participation in government in general and voting behavior in particular. Mass political behavior had long been subject to speculation by students of politics, but little was actually known about the nature and extent of citizens' perceptions of the issues, candidates, and parties. The primitive state of the knowledge in this area before the advent of sample survey research is reflected in Gosnell's article on "Voting" in the ENCYCLOPEDIA OF THE SOCIAL SCIENCES (1932). Virtually the entire article is limited to experiences with voting turnout in various countries and to a discussion of some factors related to turnout disclosed mainly through Gosnell's own research on the subject. No mention whatsoever is made of factors relating to voting choice. The counterpart article in the forthcoming INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES will be able to draw upon a body of literature about variables involved in the voting choice which was simply unavailable to Gosnell.

Another insight to the state of knowledge about voting behavior before sample surveys were employed is furnished by the "marketplace" model underlying the first major study using field interviewing and sampling methods. THE PEOPLE'S CHOICE (1944) studied the 1940 presidential election in Erie County, Ohio for the effects of mass media on the voters as they shopped among the candidates prior to casting their vote. The basic design of the study severely overestimated the role that the mass media played in the voter's decisions and sharply underestimated the importance of party loyalties in their decisions. But ponder Rossi's point:

It is easy for present-day readers to judge THE PEOPLE'S CHOICE as perhaps an elaboration of the obvious, and to marvel that these researchers were so naive in employing the simple model described above as a starting point. From the vantage point of current knowledge of voting behavior, much of it stemming from this work and other survey researchers following it, these findings may appear much more obvious than they did to readers at the time of the first appearance of the study (1959, p. 17).

The next two major voting studies contributed to the identification of relevant variables involved in the voting decision. VOTING (1954) disclosed the importance of family influences on voting and reported the operation of "hereditary voting" (pp. 88-90). THE VOTER DECIDES (1954) presented the first operationalization of party identification as a psychological variable which was related to a person's voting behavior but which deserved to be kept conceptually distinct from the actual voting act.

Both volumes shed light on the nature of the "independent voters," who had often been praised in the literature for their knowledge of political affairs while "party voters" had been criticized for their lack of political alertness. "Independent
Voting" rated a separate section in the ENCYCLOPAEDIA OF THE SOCIAL SCIENCES, and Francis Wilson's favorable assessment of the phenomenon explained, "Voters may reject party affiliation entirely because of ideas of civic duty, but independence generally arises from immediate issues or conditions or from a belief in causes which are placed above party adherence" (p. 648). But survey research disclosed that the typical independent voter was not homo politicus. In fact, independent voters as a group tended to be less involved in politics, had poorer knowledge of the issues, were less concerned over the outcome, and were less likely to vote. Early speculations could not have been more wrong.

Book-length voting studies and numerous research articles had advanced our knowledge of voting behavior so far that some thoughtful students began to wonder if the point of diminishing returns had not long been passed in this field. But the most recent of the major voting studies, THE AMERICAN VOTER (1960), revealed that there was still much to learn. For years voting studies had shown that the Democratic candidates for President were preferred by the non-voters, those who failed to vote but later reported to interviewers how they would have voted. The belief developed that increased turnout would automatically benefit the Democratic party, for non-voters were understood to be Democrats at heart. Yet THE AMERICAN VOTER showed that the non-voters polled after Eisenhower's second victory in 1956 said they would have voted Republican. A re-examination of data gathered after Eisenhower's first victory in 1952 revealed that slightly more than half of the non-voters had preferred the defeated Democrat, but in 1948 more than 80% of the non-voters said they would have voted for the winning Democrat Truman. The changing proportions had significance: What had been regarded as an established finding of survey research (non-voters were Democrats at heart) was apparently a manifestation of the bandwagon effect operating on people with low involvement in politics together with a series of Democratic victories for the office of President during the years of survey research.

Sample survey methodology produced other important contributions to knowledge in a field which was thought to be "researched out." Among other things, the authors found that correlation between "isolationism" and Republican party identification, which had traditionally been associated in political folklore and had been detected in 1952, had disappeared in the attitudes of the electorate in 1956. Eight years of Republican administration with no marked changes in foreign policy had apparently increased support for an "internationalist" foreign policy among Republican voters. Repeated surveying throughout time is necessary to disclose such attitudinal changes, and it is also necessary to reveal stability in attitudes.

THE AMERICAN VOTER presented data drawn from seven national samples drawn over a six year period. The percentage figures for all seven categories of party identification remained amazingly stable over all sample distributions. Additional data through 1962 have been presented in another publication (Stokes, 1962, p. 692). The pattern is the same; the distribution of party identification among the American electorate has remained virtually unchanged for more than a decade. This finding was not obvious; there was no apriori reason to expect party loyalties to be this durable. Party loyalties might have been transient enough to sway with the outcome of the vote, so that people identified with the particular party that captured their vote. If so, the distributions of party identifications over the past ten years should have fluctuated with the Eisenhower victories. But they did not. People voted Republican but still admitted thinking of themselves as Democrats.

As a direct result of the use of sample survey techniques, we know far more about the effect and durability of party identifications among the American electorate than we did before these techniques were developed. Is psychological attachment to a
political party purely an American phenomenon? No, studies of voting in Great Britain reveal similar attachments to the Labour and Conservative parties influencing the behavior of the electorate. Perhaps then lasting party identification occurs only in countries with a two-party system. At least one prominent political scientist speculated as much before sample surveys were available to gather the data. Wilson plausibly reasoned, "The multiparty system of most European and parliamentary countries blunts the clarity and traditional stability of party differentiation, making a transfer of allegiance easy" (1932, p. 649).

Sample surveying the attitudes of the French electorate, Philip Converse and Georges Dupeux produced findings which supported Wilson's speculations. In this multiparty European parliamentary country, less than 45% of those sampled admitted a preference for one of the many parties (1962, p. 9). This figure is strikingly less than the 75% of American respondents who freely admit thinking of themselves as Republicans or Democrats. Thus the sample survey seems to confirm what was already known, or thought to be known. But in another multiparty European parliamentary country, Norway, survey research techniques have detected personal identifications with one of the six major parties among nearly as high a proportion of the electorate as in the U.S. (Campbell and Valen, 1961, p. 510). The common notion that multiparty systems do not induce party loyalty among the electorate collapses when confronted with empirical data made available by a methodological innovation.

At least one example can be cited of sample survey methodology used to explain a macroscopic phenomenon which had often been noted but never satisfactorily explained. The tendency had long been observed for the party winning the presidency to lose congressional seats in the following mid-term election. Probably the most common explanation offered for this phenomenon was that the president's party never quite lived up to campaign promises and thus suffered a loss of popularity at the polls the following election. An accumulation of knowledge about voting behavior developed through years of survey research has produced a fuller, more satisfactory explanation of this phenomenon (Campbell, 1960).

Presidential elections invariably arouse more interest among the electorate than do congressional elections. Citizens with no personal attachments to the parties and people generally low in political involvement are motivated to vote in presidential elections but perhaps not in congressional elections. The short-term forces (mainly issues and personalities) acting to create interest in presidential elections usually operate to the benefit of one of the two major candidates, causing him to win more than his share of the independent vote plus a net gain of votes from those normally inclined to the other party. This process usually operates similarly across the nation to give the party winning the presidency the edge in victories in the close congressional districts. But with the drop in turnout two years later, basic party identifications tend to reassert themselves and more close congressional districts are lost by the presidential party. Or, as Campbell explained it:

If the partisan pressures of the presidential election have induced any movement toward the winning candidate among the Independents and members of the opposing party, this movement will recede in the following congressional election, partly through the dropout of voters who have supported the ticket of the winning presidential candidate and partly through the return to their usual voting positions of those Independent and opposing partisans who had been moved during the presidential year (p. 417).

If this analysis is sound, what accounts for the failure of the Democrats to suffer a normal loss of congressional seats in 1962, when the Republicans picked up only two additional seats? The explanation is found in the character of the 1960
presidential election, which did not find Kennedy carrying many Democratic congressmen into office. In fact, the Democratic party lost twenty-one seats that year, and there were simply not many Democrats in Congress from close districts that might be lost through a reassertion of party identifications in 1962. Or, as Campbell stated in an article published October 8, 1962 (a month before the congressional elections), "The basic condition which produces the typical off-year decline in the Congressional seats of the President's party is therefore absent in 1962" (p. 13). Many newspaper articles written before the elections prophesied Republican gains of varying proportions in the House, but Campbell's analysis predicted that the party division was not likely to change and that "the new Congress will not look very different from the one it replaces" (p. 15). He was right.

Scaling Techniques: This section is not intended to explore the technical aspects of scaling and will refer to specifics of scale construction only to facilitate discussion. Edwards' TECHNIQUES OF ATTITUDE SCALE CONSTRUCTION (1957) offers a good introduction to the methodology involved in formulating and testing various types of scales. Only two of these types have had extensive application in political science research. One, the "Likert" scale, seeks to determine personal attitudes by having respondents indicate their feelings toward each of a series of statements by checking one of a number of categories associated with each statement. The categories are commonly labeled, "Strongly Agree," "Agree," "Undecided," "Disagree," and "Strongly Disagree." Values or weights are assigned to each scale position and the sum of the category values obtained in responding to all statements produces an individual's scale score; hence another name, "method of summated ratings." The other standard scaling procedure in the literature is referred to as "cumulative" or "Guttman" scaling, and is more difficult to describe. Suffice it to say that Guttman scaling relies on dichotomous expressions of attitude ("Agree-Disagree") or of behavior ("Yes" Vote- "No" Vote) to a series of statements or events, and the pattern of individual responses to the entire series results in a scale score assigned to each individual. A major functional difference between Likert and Guttman scales is that the former are limited to verbal expressions of attitudes, while Guttman scaling can be performed with behavioral acts other than attitudinal responses. This distinction will appear in the following discussion, which will deal first with attitude scaling.

Writings on politics have traditionally referred to the political attitudes of masses, elites, and individual actors. Writers who referred to political attitudes in their analyses virtually always treated them quantitatively. The Church was more conservative than the lower classes; Northerners were more opposed to slavery than Southerners; women are less militaristic than men. These are all quantitative statements about attitudes. The fact that the nature of the attitudes and the extent to which they are held are not clearly specified does not alter the character of the statements. Although admittedly crude and imprecise, they are still quantitative statements.

The general objective of attitude scaling is to increase validity and precision in determining the nature or "direction" of a person's attitude toward some specified thing, person, event, or state of affairs and in measuring the intensity with which the person holds this attitude. There are various types of "measurement" recognized in the philosophy of sciences, and the type of measurement legitimately permitted depends on the nature of the data (Coombs, 1953). Some scaling techniques have been designed to produce data permitting measurement analogous to that commonly used in the physical sciences, where measurable attributes are expressed in ratios: one item has 69% more of attribute x than another item. But these existing techniques require considerable resources for execution and are not especially suited to the questions
of interest to political scientists. Other scaling techniques have been developed to produce data allowing a somewhat lower level of measurement: the interval separating items possessing a given attribute could be specified (e.g., "degrees" on a thermometer) but the amount of the attribute expressed by different items could not be expressed in ratios (e.g., a temperature of 64°F is not 100% hotter than 32°F). Some very early attempts to develop interval scales of political attitudes can be found in the literature (Beyle, 1932). Attempts to measure political attitudes through the use of elegant ratio or interval scales however, have largely fallen into disuse partly because of their complexity but also because they were limited in their applicability to research problems which interested political scientists.

The failure of ratio and interval scaling to find favor among political behaviorists should provide some thought for those who charge that the behavioral approach results in "the sacrifice of political relevance on the alter of methodology" (Barns, 1962, p. 55). In actuality, behaviorists turned away from the methodologically elegant but substantively inappropriate scaling techniques and relied upon those which had greater applicability to their research interests. The types of scales which have been employed in most political science research to date have sought merely to order individuals according to the intensity of their attitudes without attempting to specify the magnitude of the intensity.

Although "operationalization" is not limited to scaling attitudes, the construction of a scale to measure a given attitude amounts to an operationalization of that attitude. The operationalization of "party identification," discussed above, involves a simple form of Likert-style ordinal scaling around a "neutral" partisan position. The first question, "Do you generally think of yourself as a Republican, a Democrat, an Independent, or what?" is asked to determine direction of the person's attitude, and his response to the second question is used to indicate the intensity of his feeling toward the party of his choice. As a result of these questions, respondents can be ranked ordered on both sides of the scale as "strong," "weak," or "leaning" partisans. The validity of the ordering achieved through this simple procedure has been demonstrated repeatedly in study after study across the United States. Those categorized as "strong" partisans show more consistency in voting for their party than the "weak," who, in turn, show more consistency in party voting than the "leaners."

Certainly the most ambitious effort to develop Likert-type scales to measure social and political attitudes is that contained in THE AUTHORITARIAN PERSONALITY (Adorno et al., 1950), which developed elaborate scales to measure anti-semitism, ethnocentrism, authoritarianism, and conservatism. In the course of their research, the authors found that anti-semitism was largely a manifestation of a generalized prejudice towards groups with which the individual does not identify, and that this ethnocentrism was in turn largely a manifestation of authoritarianism, which involves such things as a rigid adherence to conventional values, submission to in-group leaders, rigidity of thought, etc. Political philosophers had often speculated about the type of mind necessary to accept and support the compromises involved in democratic government. The "authoritarian" personality was clearly involved in their speculations. A measure was now available to find out who held these attitudes and how the attitudes were reflected in political action. Scaling techniques were employed together with sample surveys to produce some definite knowledge about the nature, extent, and consequences of authoritarianism for political participation.

The "authoritarian personality" has been thought to be especially susceptible to programmatic appeals of strong political leaders. Early research on authoritarianism was complicated in many instances by failure to control relevant demographic variables
and by ignorance of response-set bias involved when using only statements in which an "agree" response was authoritarian (Chapman & Campbell, 1959). Nevertheless, the consistent finding was that "authoritarians" were not more inclined towards political action than non-authoritarians. Recent research which controlled for both demographic variables and response set shows that, if anything, authoritarian attitudes constitute "a barrier to political participation" (Milbrath & Klein, 1962, p. 64). Much of the early concern about the deteriorating influences of authoritarian personalities on a nation's political life needs to be re-considered in light of the evidence produced on the authoritarian personality.

Probably most of the political science literature which hypothesized relationships between attitudes towards governmental affairs and political behavior has been concerned with the political ideologies men have held. Popular and scholarly writing has often analyzed political affairs in terms of "liberals" and "conservatives." Even before the advent of scaling techniques, attempts were made to measure these ideological orientations indirectly by treating votes cast for "progressive" candidates or referenda as objective indicators of underlying attitudes (Ogburn & Petersen, 1916; Rice, 1928). Development of attitude scaling enabled researchers to speak more precisely and confidently about the character and distribution of ideological factors among the citizenry and its politicians.

In the traditional literature (and in the early research literature), the labels "liberalism," "conservatism," and "progressivism" were used without much attempt to specify the nature of the political attitudes subsumed under the labels. We know now that there are several quite distinct attitudinal elements involved in these ideological labels. The authors of THE AUTHORITARIAN PERSONALITY had considerable difficulty in devising an acceptable scale from statements relating to support of the status quo, resistance to social change, support of middle-class values, and a laissez-faire government economic policy - all attitudes thought to be characteristic of a "conservative." They then concluded that conservatism was not a single, unitary system but contained a number of trends or components.

The application of Guttman scale analysis to similar statements in subsequent research has revealed, for example, that statements dealing with the desirability of governmental action in areas of social welfare and statements about the desirability of U.S. intervention in international affairs tap different attitudinal bases and elicit varying responses from the same people (Campbell et al., p. 195). In the period before Eisenhower's presidency, there was a definite relationship between these two separate attitudes, and a "conservative" was against both governmental intervention in the economy and an activist foreign policy. But at least by 1956, data from a national sample showed "no relationship between scale positions of individuals on the domestic and foreign attitudinal dimensions" (Campbell et al., 1960, p. 197).

Another attitudinal trait thought to be possessed by conservatives is an acceptance of the status quo. Herbert McClosky developed a scale designed to measure this dimension and found "contrary to claim, conservatism is not the preferred doctrine of the intellectual elite or of the more intelligent segments of the population but the reverse. By every measure available to us, conservative beliefs are found most frequently among the uninformed, the poorly educated, and so far as we can determine, the less intelligent" (1958, p. 35). Furthermore, McClosky's finding that this type of conservatism relates poorly to party identification has been confirmed by subsequent researchers (Campbell et al., 1960, p. 211). The only component of conservatism which relates to party identifications in the contemporary electorate is an opposition to social welfare policies. Generalizations that Republican voters are conservative
in their attitudes toward foreign affairs, changes in the status quo, and social welfare measures are, at best, out of date.

Guttman scale analysis of congressional roll call voting reveals that "liberal-conservative" labels must also be used with care in describing the voting positions adopted by our national legislators. Duncan MacRae's analysis of voting in the 81st Congress disclosed that individual Democrats and Republicans responded quite differently to issues which were commonly lumped together under the same label. It was found that individual congressmen displayed consistency in their positions taken on a number of roll call votes which reflected an economic liberalism-conservativism: extension of rent control, repeal of Taft-Hartley, creation of a Department of Health, Education, and Welfare, etc. But individual congressmen who adopted a consistent attitudinal position somewhere along the economic dimension over the series of votes could not have their positions predicted with much confidence on votes dealing with "race relations." Congressmen could vote "conservative" on economic matters but "liberal" on civil rights. A similar finding resulted for votes dealing with "foreign aid." A "liberal" on foreign aid questions might be a "conservative" on race relations and a middle-of-the-road on economic matters. Through the use of Guttman scaling, the multiple-dimensional character of political ideologies was revealed with a clarity and certainty never before demonstrated in the literature.

The contributions of Guttman scaling techniques to the study of public law have recently been detailed in Glendon Schubert's bibliographical essay, "Behavioral Research in Public Law" (1963). Schubert points out that the early orientation to this techniques "was markedly empirical, since the most significant variables had not yet been identified, and the potentialities of either the theory or the method were unknown" (p. 442). Those who persisted with scaling judicial voting, however, soon produced impressive evidence concerning the importance of specific attitudinal factors in judicial decisions. Ulmer's study of the Supreme Court's decisions in civil liberties cases from 1955 to 1960 disclosed an amazing stability in the justices' attitudes towards these cases (1960), and Schubert was able to scale 90% of the 99 non-unanimous decision made during the 1960 Court with the use of only three scale variables: civil liberties, economic liberalism, and government fiscal authority (1962). Schubert reports on other research which has disclosed that individual justices' attitudes towards civil liberties and economic issues have been evidenced in judicial decisions for much of the history of the Court.

**Punch Card Data Processing:** The use of punch cards in empirical research will be regarded as a techniques for the collection of data, although one might argue that it is really a method for recording data. Whatever the distinction might imply, the use of punch card data processing is probably the most visible methodological innovation in empirical research, and the punch card might even be considered as the symbol of behavioralism. The influence of punch card data processing in political science has been so pervasive that it seems, at the same time, both unnecessary and futile to document its contributions to political science knowledge. The task is almost like showing the contributions to scholarly knowledge which resulted from the introduction of the desk calculator. Granting that it facilitated research, should the desk calculator be credited with the findings of all the studies in which it was used? Much the same problem confronts an attempt to identify the substantive advances due to the use of punch card data. This section then will concentrate more on the primary advantages of using punch card data in research by illustrating their uses in specific studies.

There seem to be four advantages to collecting data in punch card form. (1) Punch cards greatly facilitate analysis of large quantities of data. (2) Punch cards permit a great deal of flexibility in analysis by allowing data to be reclassified,
modified, and tabulated in a variety of ways which may even have been totally unan-
ticipated before the data were gathered. (3) Punch card data are easily reproduced
and made available for analysis by other researchers. (4) Punch card data are readily
processed with the use of high speed computers.

The punch card was developed as a means of recording data by Dr. Herman Hollerith,
who had used paper strips for processing census data as early as 1887 (Hyman, p. 19).
Although the punch card format had been used in political science research at least
as early as 1924 (Herriam & Gosnell), extensive use of the techniques did not develop
until after 1933, and it was not widely adopted by political scientists until after
the Second World War. Before 1940, however, Hyneman had used punch cards in making
a comprehensive survey of occupational and political characteristics of the legis-
lators in thirteen different states who served between 1925 and 1935. In his effort
to answer the interesting question, "Who Makes Our Laws?", Hyneman gathered and an-
alyzed data on 12,689 memberships in legislative bodies. This mass of data was re-
corded on cards and analyzed according to chamber, state, occupation, length of
service, chairmanship, and urban-rural character of the districts. The tabulations
showed that the "bicameral system is not producing senates which differ from the lower
house, so far as means of livelihood of legislators is concerned" (1959, p. 257).
The lawyers stood out as the largest occupational grouping in more than 2/3 of the
chambers studies, and the farmers were a strong second. But, after checking on the
population characteristics of the states studied, Hyneman concluded that "contrary
to the supposition of most writers, the farmer does not enjoy membership in the
state legislature greatly out of proportion to his numerical importance in the whole
population" (p. 258). This early study, along with others Hyneman performed with the
use of punch card data, disclosed some important parameters of the population of
American state legislators.

In contemporary political science research, punch cards have been used most
commonly to record data collected through sample surveys, but extensive use of the
punch card format has also been made in studies of legislative roll call voting. The
authoritative CONGRESSIONAL QUARTERLY analyses of the votes cast by half a thousand
legislators on approximately 200 votes a session have been prepared from punch card
data. Richard Hovet's comprehensive analysis of BLOCK POLITICS IN THE UNITED NATIONS
(1960) also utilized data in punch card form to facilitate the analysis of the positions
taken by all member nations on 521 recorded votes from 1946 to 1959. The punch
card provides an effective and efficient medium for handling such masses of data,
which accounts for the common use of punch cards in survey research. After describing
seven major survey research projects, Herbert Hyman comments on a feature they all
share:

All such inquiries are massive in size. We note such numbers of cases as 2000,
5300, 1800, and the like. Generally, the number of observations that must be
treated or manipulated far exceeds this total number of cases since it is
dominant characteristic of these inquiries that many factors are measured simultaneously
in each case. ... Consequently, the amount of processing and tabulating of
data is great. ... It is almost universal in current survey research that
automatic or machine methods of processing data are used (1955, pp. 18-19).

Hyman then discusses Hollerith's development of the punch card to aid in processing
the U. S. Census of 1890 and points out, "In other words, the very technological
development of such equipment arose in response to the need of the scientist involved
in survey research to process quantitative data efficiently" (p. 19).

Even when the number of cases is not especially large, punch cards can be used
to great advantages if there are many variables which might serve for the basis of
analysis. The ambitious study of four state legislatures reported in THE LEGISLATIVE
SYSTEM (Vahlke, Eulau, Buchanan, & Ferguson, 1962) offers a good illustration. The total number of legislators involved in the study was "only" 474, but the data were recorded on many aspects of the legislators' social, personal, and political lives. The various analyses performed in this study would have been prohibitive were the data not collected on punch cards, which impart a flexibility to data that does not exist when they are recorded in standard written form.

The re-usability of punch card data for secondary analysis by scholars interested in research not originally contemplated when the data were collected is convincingly demonstrated in Seymour Lipset's important book, POLITICAL MAN (1960). Using decks of data cards made available to him by research agencies in different countries, Lipset was able to conduct comparative research into the relationship between social class and extremist politics. Lipset noted that the intellectuals of the democratic left had "once believed the proletariat necessarily to be a force for liberty, racial equality, and social progress" (p. 97). But his analysis of public opinion data from a number of countries shows "that the lower classes are much less committed to democracy as a political system than are the urban middle and upper classes" (p. 102). His analysis further reveals that the lower classes are not quick to respond to ideological appeals of a budding political party which promises future benefits through a complex readjustment in the social structure. In fact, he found that where the extreme parties, such as the Communist party, are small, "support is stronger among the better paid and more skilled workers than it is among the less skilled and poorer strata" (p. 123), and this holds true in all countries Lipset studied.

Another major advantage in collecting data on punch cards lies in their ability to be processed by modern computers. With the use of punch card data and an electronic computer, David Derge was able to analyze 3,662 roll call votes from five sessions of the Illinois and Missouri legislatures for the presence or absence of urban-rural conflict. After tabulating and correlating more than 500,000 votes cast in these legislative sessions, Derge concluded—contrary to statements made by many prominent students of state and local government—that, in these states:

1. Non-metropolitan legislators seldom vote together with high cohesion against Metropolitan legislators.
2. Metropolitan legislators usually do not vote together with high cohesion.
3. Metropolitan legislators are usually on the prevailing side when they do vote together with high cohesion (1958, p. 1065).

There is at least one clear case of a major substantive advance being directly attributable to the developments in punch card data processing. All the advantages of punch card data were evidenced in the successful attempt to simulate the voting behavior of the American electorate before the 1960 presidential election (Pool & Abelson, 1961). The "simulmatics project," as it was called, would have been inconceivable without the use of punch card data. First of all, the project utilized poll data collected before the elections from 1952 to 1958 and stored on punch cards at the Roper Public Opinion Research Center. A total of fifty surveys representing more than 85,000 interviews were used to construct a "model" of the American electorate according to 480 "voter types" defined by socio-economic characteristics. (One voter type might be "Eastern, metropolitan, lower-income, white, Protestant, male, Democrats.") Responses of individuals contained in each of the voter types were then ascertained for types of questions asked in the various surveys—questions relating to foreign aid, attitudes toward Catholics, etc.

In order to simulate how the American electorate might vote in November if the religious issue dominated the campaign, the computer was instructed to make 480
separate calculations using an appropriate set of equations for each voter type. "During each of the 480 calculations, the computer put into the equations values, for turnout record, 1958 vote intention, 1956 vote intention, and anti-Catholicism, derived from the data which had been assembled about that particular voter type. This gave a 1960 vote estimate for each voter type for the particular hypothetical campaign being investigated" (p. 180). Despite the crude assumptions used in this first attempt to simulate the voting behavior of an entire nation for a given election still months away, the state-by-state prediction of the 1960 vote correlated .82 with the actual outcome. And the authors state, "It should be emphasized that this satisfying result was based upon political data not a single item of which was later than October 1958" (p. 177). Underscoring the success of this exploration in simulation, a prediction of the 1960 presidential vote based on a multiple correlation of 1958 and 1960 state returns for president correlated only .44 with the actual outcome. Commenting on their experience, the authors pointed out:

This kind of research could not have been conducted ten years ago. Three new elements have entered the picture to make it possible: first, a body of sociological and psychological theories about voting and other decision; second, a vast mind of empirical survey data not for the first time available in an archive; third, the existence of high-speed computers with large memories (p. 183).

Correlational Analysis: Correlational techniques are employed to determine the existence or strength of an association between two variables. Under proper conditions, correlational measures permit one to make comparative statements about the strength of relationships among pairs of variables. Despite their early applications in political research (Ogburn & Goltra, 1919; Rice, 1926), correlational techniques were seldom used before 1933. Writing in that year, Gosnell observed, "Economists and educators have made extensive use of correlation," but "In political science these methods do not seem to have gained very general recognition" (p. 401). The correlational measure employed most commonly before 1933 was the Pearsonian product-moment coefficient. Rice's QUANTITATIVE METHODS IN POLITICS (1928) discusses the use of this measure in the study of voting behavior through the analysis of election returns and census data. But for methodological reasons quite apart from the validity of the Pearsonian formula, such ecological correlations left much to be desired as a technique for studying the voting behavior of individuals (Robinson, 1950). Another factor restricting the wider usage of the product-moment correlational coefficient was that this measure assumed the data to be completely quantitative in nature. Although election returns and census figures were admissible data under Pearsonian assumptions, many of the data which attracted the interest of students of politics could not satisfy these assumptions.

Recent years have seen the development of a number of nonparametric statistics, which do not require ratio or interval scale data (see Siegel, 1956, for a comprehensive and readable treatment of various nonparametric statistics). Several of these measures have found extensive use by political scientists. One of the earliest and simplest nonparametric measures of statistical association used in political research is chi-square, which enables one to determine the probability that an apparent relationship observed between variables is merely a chance relationship. If the observed relationship is unlikely to be caused by chance factors, then support is given to a hypothesis of causal association between the variables. The simple data assumptions underlying chi-square have made it one of the most commonly used tests of significance in political science research.

Even qualitative data, such as roll call votes, can be properly analyzed with the chi-square statistic. Lowell's early study of party voting in congress (1902),
which did not use this technique, sought to determine the extent of party voting by operationalizing a "party vote" as a roll call which recorded at least 90% of both parties on opposite sides of the issue. Measured by this standard, Lowell found that the peak period of party voting in the period he studied occurred during the McKinley administration, when about 50% of all congressional roll calls were "party votes." Research on later periods using the same measure showed that the proportion of party votes hovered around 17% per session, compared to 95% for comparable periods in the British House of Commons (Turner, 1951, p. 24). It might be argued that Lowell's criterion for a party vote is excessively high and that evidence of party voting could be detected on votes which did not qualify as "party votes" under his definition. Using chi-square to test for the existence of party pressures on all roll call votes taken during 8 selected sessions of Congress, Turner found that traces of party influence could be detected on nearly 90% of all the votes, indicating that party influence in congressional voting is more pervasive than previously thought (p. 31).

Stuart Nagel also used chi-square in his attempt to determine the effect of party identification on judicial decisions. Nagel gathered data on the cases heard in 1955 by 298 state and federal appellate court judges and analyzed the judges' voting positions according to their party identifications. He concluded that the relationship between party identifications and voting decisions was statistically significant for 9 of the 15 issue areas into which the cases were classified. Democratic judges consistently tended to favor the defense in criminal courts, the administrative agency in business regulation cases, the claimant in unemployment cases, the finding of a constitutional violation in criminal-constitutional cases, the government in tax cases, the tenant in landlord-tenant cases, the consumer in sales of goods cases, the injured party in motor vehicle accident cases, and the employee in employee injury cases (p. 845). Nagel also sought to determine the effect of devices thought to remove the influence of party in judicial decisions by analyzing the judges' positions according to their status as appointed or elected officials, and, if elected, by separating them according to the length of their terms and the partisan or non-partisan nature of the ballot. The chi-square test showed that only the appointed-elected distinction appears to bear a strong relationship to party voting, appointed judges being more likely than elected judges to vote contrary to the positions which characterized their party. The effects of the other reform devices—the partisan nature of the ballot and the length of office—were not found to be statistically significant in this study.

The chi-square statistic is useful for determining the existence of relationships between variables, but for technical reasons, it lacks as a measure for comparing the strength of relationships existing among pairs of variables. The research literature in political science has employed some nonparametric statistics designed to fill this need. The contingency coefficient has been used by Russell Fitzgibbon and Kenneth Johnson to reveal intercorrelations among selected measures of Latin American political change (1961). Lewis Froman used the phi coefficient to demonstrate that liberal voting records of U. S. Congressmen are associated with constituency differences independently of political party (1963). The Spearman rank-order correlation coefficient was used by Wayne Francis to show that state legislators who rank high in attributed influence in certain areas—notably taxation, appropriations, and business—were more likely to be regarded as generally influential in the legislature and more likely to be able to "transfer" their influence than those who were considered influential in other fields of public policy—such as agriculture and labor (1962).

Kendall's tau statistic has recently been utilized by political scientists who sought to achieve greater precision and reliability in making comparisons and
determining probability levels while keeping the measure suitable to the data being used. Philip Converse used Kendall's tau, which offers a conservative estimate of the Pearsonian correlation coefficient, in investigating the influence of social class in American voting behavior. Some writings have assumed that social class provides a constant influence upon political participation. Converse, however, found that, at least in the United States, "the strength of the relationships between status and political variables is subject to more short-term variation than is generally recognized" (1958, p. 359). Examining the relationship between identifications with the middle or working classes and tendencies toward Republican or Democratic voting in presidential elections, Converse produced tau coefficients which rose from .22 in 1944 to a high of .44 in 1948 and then declined to .25 in 1952 and .12 in 1956. (A later article by Robert Alford (1963) has shown that the extent of class voting continued its decline in the presidential election of 1960, but that the 1930's, contrary to popular belief, were not characterized by much higher levels of class voting. At least in 1936, the amount of class voting was less than that reached in 1948.)

**Multivariate Analysis:** Political phenomena usually have their roots in a multiplicity of causal factors. In efforts to isolate the influence of one variable for study, empirical researchers frequently hold one or more variables "constant" while examining the relationship between two other variables. It is sometimes possible to hold variables constant by physically separating the cases during analysis. The process can be illustrated by an analysis of the influence of religion on voting behavior. Catholics tend to vote Democratic, but Catholics also tend to live in urban areas and to rank low in socio-economic status, and both urbanization and low socio-economic status are themselves positively related to Democratic voting. In order to isolate the relationship between Catholicism and voting behavior, researchers have matched low-income urban Catholics with low-income urban Protestants—thus holding place of residence and socio-economic status constant—and have discovered that the relationship between Catholicism and voting Democratic almost disappears. A strong relationship between religion and voting Democratic is retained, however, when Jewish voters are similarly matched against non-Jewish voters (Campbell et al., 1960, p. 306).

The use of special statistical techniques offer another approach to the problem of holding certain variables constant while the relationships between other variables are measured. Techniques of partial and multiple correlation have been used to study the relationships between two variables by holding a third variable constant at least as early and 1919 (Ogburn & Goltra). But once again, these techniques did not receive wide usage before 1933 because of "the absence of available data on some problems, the lack of familiarity with the technique among political scientists, the laboriousness of the process, and the deficiency of suggestive hypotheses" (Gosnell, 1933, p. 402). All of these barriers to the use of correlational techniques in political research have been greatly reduced in recent years, and the "laboriousness of the process" has virtually been eliminated with the development and utilization of computer programs to perform the calculations. Complex correlational techniques appear quite frequently in the modern research literature.

Phillips Outright and Peter Rossi used such techniques in their approach to answering the question, "How many percentage points advantage does a party obtain by having a good precinct committeeman on the job?" (1963, p. 775). Employing a multiple correlation coefficient and the associated regression equation, they established the "normal" Democratic vote that a precinct could be expected to produce on the basis of certain social variables. They then determined the difference between
this expected level and the amount actually received by the Democratic party in precincts with different levels of activity, as determined through questionnaires returned by Republican and Democratic precinct committeemen. They concluded that "the increment to a party from the best, as compared with the worst, precinct workers amounted to about 5 per cent in the 1956 presidential election in the midwestern industrial city studied" (p. 779). Subsequent research in a different community by investigators using much the same methodology produced similar findings and indicated in addition that the amount of increment stemming from strong precinct activity is likely to be higher for the party which has traditionally been in the minority in the precinct (Katz & Eldersveld, 1961, p.10).

Some of the most methodologically and substantively interesting applications of multivariate analysis to problems of political research have been made at the University of Michigan's Survey Research Center. Possessing sample survey data on the attitudes of the electorate towards the parties and candidates in 1952 and 1956, Donald Stokes, Angus Campbell, and Warren Miller sought to devise "an explicit technique by which we could know in any presidential election the relative influence on the outcome of each of a set of factors affecting the result" (1958, p. 367). The authors were able to classify most of the voters' likes and dislikes about the parties and candidates into six different "attitude forces" which moved persons toward Republican or Democratic voting. These components of the electoral decision were identified as (1) attitude toward Stevenson, (2) attitude toward Eisenhower, (3) attitude toward the parties as benefitting certain groups within the population, (4) attitude on foreign issues, (5) attitude on domestic issues, and (6) attitude toward the parties as managers of government. Calculating the net benefit to the Democratic and Republican candidates as a result of the voters' attitudes on each of these six dimensions, the authors concluded that the Republican victory of 1952 resulted from the great appeal of Eisenhower, from a pro-Republican attitude toward foreign issues, and from a strongly anti-Democratic response to the parties as managers of government. . . . The Republican victory of 1956 seems to have resulted from somewhat different components. In the latter election, the force of Eisenhower's appeal seemed of paramount importance. The Republican cause was again aided by a favorable response to foreign issues. But with the corruption issue spent, the public's attitude toward the parties as managers of government contributed much less to the Republican majority. On the Democratic side, the appeal of Stevenson was apparently no longer more an asset than a liability to his party, and the party's advantage in domestic issues was greatly diminished (p. 382).

Miller and Stokes later employed a "variance-component" technique for analyzing the intercorrelations among representative's attitudes on social issues, their constituencies' attitudes toward the same issue, the representatives' perceptions of their constituencies' attitudes, and the representatives' roll call behavior in voting on similar issues. Analyzing this unique collection of data with the use of an elaborate multivariate statistical model, the authors found that the congressmen's perceptions of their constituencies' attitudes were the most important factor in voting behavior on questions of civil rights. In the area of social welfare legislation, however, the constituency is more likely to exert control over the voting behavior of its representative through the personal attitudes of the man it selects (1963, pp. 52-53).

Another technique of multivariate analysis has recently been used by political scientists confronted by an array of intercorrelated variables generated out of their research efforts. Factor analysis is a general method for discovering which of the
variables tend to co-vary together because of some underlying "factor" they have in common. Rudolph Rummel's factor analysis of nine different measures of domestic conflict and thirteen separate measures of foreign conflict collected for 77 nations during the years 1955, 1956, and 1957 showed, among other things, that "foreign conflict behavior is generally completely unrelated to domestic conflict behavior" and that a nation's involvement in some kind of foreign conflict is generally unrelated to a reduction of domestic conflict (1963, p. 67). Erik Allardt's factor analysis of variables related to party voting in Finland disclosed that the Communist vote in 1954 was strongly related to traditional voting behavior and had little relationship to more dynamic measures of social life such as "modernization," "social mobility," and "social insecurity," which are commonly thought to be associated with Communist voting (1961).

Empirical Research and Future Contributions to Knowledge

This fleeting review of substantive contributions of selected methodological innovations was intended to show that behavioral methodology has done more than disclose trivialities and "document the obvious." To be sure, not all the substantive advances cited have been of equal importance. So far I have tried to avoid evaluating the importance of specific contributions, but it is now appropriate to inquire briefly into criteria which might be used to identify research findings which are clearly important to our knowledge of politics.

Even the most conservative judge of scholarly progress would surely be persuaded to grant the importance of any research which offered convincing explanations of macroscopic phenomena (a) occurring over time within the same political system or (b) operating within different political systems. Admittedly, behavioral research cannot lay claim to many contributions of this caliber. Of all the various research findings discussed in the previous pages, I would only feel safe offering three for inclusion in this category. I would nominate (1) the disclosures that the prevalence of party identifications among a nation's voters is not necessarily a function of the number of parties in the system, (2) the explanation of the presidential party losing seats in the off-year elections in terms of voter involvement and the reassertion of party identifications, and (3) the demonstration that the relationship between social class and political behavior in the United States has fluctuated considerably over time.

The reason that behavioral research has not produced more explanations of macroscopic phenomena is not that its methodology is unsuited to the task but that its methodology has not been applied often enough and in enough different systems to build a structure of findings with sufficient breadth and depth to support such explanatory efforts. In order to explain the occurrence of phenomena within the same political system over time, data must be painstakingly accumulated over time. In order to explain the occurrence of phenomena operating within different political systems, observations must be gradually accumulated for different political systems. One simply cannot make trend analyses without trend data nor make comparative analyses without comparative data. But behavioral methodology is still young, and the data relevant to macroscopic explanations are just beginning to be assembled.

Future methodological innovations in empirical research will undoubtedly produce their own contributions to substantive progress in political science, and genuine methodological breakthroughs are bound to be followed by substantive leaps in our knowledge. But I need not conclude my paper by echoing the theme of
behavioralists before 1933—that the payoff of the behavioral methodology must await the development of new techniques. A wide enough assortment of research tools has been made available for political research to enable the behavioralists to begin paying their own way. A substantial return on the investment in behavioralism is assured when the structure of findings acquires the necessary breadth and depth to support macroscopic explanations of political phenomena. If a moratorium were called on the development of new techniques and the behavioralists were forced to rely on the present state of technology, the utility of the behavioral approach would still be inevitably demonstrated through the explanation of macroscopic phenomena following the accumulation of research findings within and between political systems.
Bibliography


Derge, David R. "Metropolitan and Outstate Alignments in Illinois and Missouri Legislative Delegations," AMERICAN POLITICAL SCIENCE REVIEW, 52 (December, 1958), 1051-1065.


MacRae, Duncan, Jr. DIMENSIONS OF CONGRESSIONAL VOTING. Berkley: University of California Press, 1956.


Bibliography (con't 5)

Rice, Stuart A. QUANTITATIVE METHODS IN POLITICS. New York: Knopf, 1928.


